

MGNet Bibliography¹

Craig C. Douglas² and
Marietta B. Douglas³

September 28, 2002

Please send additions or corrections to mgnet@cs.yale.edu. Do not send them to www.mgnet.org.

For a correction, please send the date that is on page 1, the citation number, and the correction. Note that the bibliography is updated on MGNet less often than on our computer at home (where the bibliography percolates out from).

Additions should only include published papers, not research reports. The exceptions are typically conference proceedings published through some institution, e.g., GMD or NASA.

If you use this bibliography in your own works, please cite [997].

REFERENCES

- [1] *Ninth International Conference on Domain Decomposition Methods*, Bergen, 1997, DDM.org.
- [2] A. M. ABDALASS, J. F. MAITRE, AND F. MUSY, *A multigrid solver for a stabilized finite element discretization of the Stokes problem*, in Multigrid Methods II, W. Hackbusch and U. Trottenberg, eds., Berlin, 1986, Springer-Verlag, pp. 1–6.
- [3] B. ACHCHAB AND J. F. MAITRE, *Estimate of the constant in two strengthened C.B.S. inequalities for the F.E.M. system of the 2D elasticity. application to multilevel methods and a posteriori error estimators*, Numer. Lin. Alg. Appl., 3 (1996), pp. 147–159.
- [4] Y. ACHDOU, J.-C. HONTARD, AND O. PIRONNEAU, *A mortar element method for fluids*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 351–360.
- [5] Y. ACHDOU AND Y. KUZNETSOV, *Algorithms for the mortar element method*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 33–42.
- [6] J. C. ADAMS, *FMG results with the multigrid software package MUDPACK*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 1–12.
- [7] ———, *FMG results with the multigrid software package MUDPACK*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 1, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 1–13.
- [8] ———, *MUDPACK: Multigrid software for linear elliptic partial differential equations*, tech. report, NCAR, Boulder, 1989. Revised in February, 1990.
- [9] ———, *Recent enhancements in MUDPACK, a multigrid software package for elliptic partial differential equations*, Appl. Math. Comput., 43 (1991), pp. 79–93.
- [10] ———, *MUDPACK 2: multigrid software for approximating elliptic partial differential equations on uniform grids with any resolution*, Appl. Math. Comput., 53 (1993), pp. 235–249.

¹Copyright 1991-2002

²University of Kentucky, Department of Computer Science and Center for Computational Sciences, 325 McVey Hall - CCS, Lexington, KY 40506–0045, USA and Yale University, Department of Computer Science, P. O. Box 208285, New Haven, CT 06520–8285, USA. E-mail: cdouglas@na-net.ornl.gov.

³Wyeth, 401 N. Middletown Road, Pearl River, NY 10965, USA. E-mail: mlette_97@yahoo.com.

- [11] J. C. ADAMS, R. GARCIA, B. GROSS, J. HACK, D. HAIDVOGEL, AND V. PIZZO, *Applications of multigrid software in the atmospheric sciences*, Mon. Wea. Rev., 120 (1992), pp. 1447–1458.
- [12] L. M. ADAMS, *A multigrid algorithm for immersed interface problems*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 1–14.
- [13] L. M. ADAMS AND M. E. G. ONG, *Additive polynomial preconditioners for parallel computers*, Parallel Comput., 9 (1989), pp. 333–345.
- [14] R. A. ADAMS, *Sobolev spaces*, Academic press, New York, 1975.
- [15] S. E. ADAMS AND U. M. ASCHER, *Using multigrid for semiconductor device simulation in 1-D*, in Computational Ordinary Differential Equations, S. Fatunla, ed., Ibadan University Press, 1992, pp. 1–35.
- [16] R. AGGARWAL, F.-X. ROUX, AND R. KEUNINGS, *Iterative methods for the solution of integral viscoelastic equations on parallel computers*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North-Holland), Amsterdam, 1995, pp. 411–418.
- [17] V. I. AGOSHKOV, *Poincaré-Steklov's operators and domain decomposition methods in finite dimensional spaces*, in First International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. Périaux, eds., Philadelphia, 1988, SIAM, pp. 73–112.
- [18] ———, *Domain decomposition method: some results of theory and applications*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 3–18.
- [19] ———, *Domain decomposition methods using modified basis functions*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 3–15.
- [20] V. I. AGOSHKOV AND V. I. LEBEDEV, *Poincaré-Steklov operators and domain decomposition methods in variational problems*, Vychisl. Protsessy i Sistemy, 2 (1985), pp. 173–227.
- [21] A. AGOUZAL AND N. DEBIT, *A new approach to domain decomposition methods with non-matching grids*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 53–63.
- [22] G. AGRAWAL, A. SUSSMAN, AND J. H. SALTZ, *Compiler and runtime support for structured and block structured applications*, in Proceedings of the Supercomputing Conference 1993, Los Alamitos, 1993, IEEE, Computer Society Press, pp. 578–587.
- [23] ———, *Efficient runtime support for parallelizing block structured applications*, in Proceedings of the Scalable High Performance Computing Conference 1994, Los Alamitos, 1994, IEEE Computer Society Press, pp. 158–167.
- [24] ———, *An integrated runtime and compile time approach for parallelizing structured and block structured applications*, IEEE Trans. Parallel Distrib. Syst., 6 (1995), pp. 747–754.
- [25] S. AGRAWAL, S. F. CREASMAN, AND R. B. LOWRIE, *Evaluation of Euler solvers for transonic wing-fuselage geometries*, J. Aircr., 28 (1991), pp. 885–890.
- [26] G. AGUILAR AND F. LISBONA, *Interface conditions for a kind of non linear elliptic-hyperbolic problems*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 89–95.
- [27] K. H. AHN AND D. A. HOPKINS, *Generalized domain decomposition technique for mixed-iterative finite element formulation*, Comput. Sys. Eng., 5 (1994), pp. 351–361.
- [28] X. AI AND H. S. CHENG, *Transient EHL analysis for line contacts with measured surface roughness using multigrid technique*, in Proceedings of the STLE/ASME Tribology Conference, New York, 1993, ASME, pp. 1–8.
- [29] ———, *Influence of moving dent on point EHL contacts*, Tribol. Trans., 37 (1994), pp. 323–335.
- [30] ———, *Transient EHL analysis for line contacts with measured surface roughness using multigrid technique*, J. Tribol. Trans. ASME, 116 (1994), pp. 549–558.
- [31] M. AINSWORTH, J. LEVESLEY, M. MARLETTA, AND W. A. LIGHT, *Wavelets, Multilevel Methods and Elliptic PDE's*, Numerical Mathematics and Scientific Computation, Oxford University Press, Oxford, 1997.
- [32] H. AIXIANG, *Convergence of finite element multigrid algorithm for the Navier–Stokes equations*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 1, Denver, 1989, Computational Math-

- ematics Group, Univ. of Colorado, pp. 15–18.
- [33] M. AL-NASRA AND D. T. NGUYEN, *An algorithm for domain decomposition in finite element analysis*, Comput. Struct., 39 (1991), pp. 277–289.
- [34] P. ALART AND F. LEBON, *Multigrid method applied to mixed formulation for frictional contact problem*, in Contact Mechanics, Computational mechanics publications, 1993, pp. 227–234.
- [35] G. D. ALBADA, B. LEER, AND W. W. ROBERTS, *A comparative study of computational methods in cosmic gas dynamics*, Astron. Astrophys., 108 (1982), pp. 76–84.
- [36] R. E. ALCOUFFE, *The multigrid method for solving the two-dimensional multigroup diffusion equation*, in Advances in Reactor Computations, Salt Lake City, 1983, pp. 340–351.
- [37] R. E. ALCOUFFE, A. BRANDT, J. E. DENDY, AND J. W. PAINTER, *The multi-grid methods for the diffusion equation with strongly discontinuous coefficients*, SIAM J. Sci. Stat. Comput., 2 (1981), pp. 430–454.
- [38] M. ALEF, *Mehrgittermethoden: Diskretisierungen höherer Ordnungen für Dirichlet-Standardaufgaben in Rechtecksgebieten*, PhD thesis, Institut für Angewandte Mathematik, Universität Bonn, 1982.
- [39] ———, *Concepts for efficient multigrid implementation on SUPRENUM-like architectures.*, Parallel Comput., 17 (1991), pp. 1–16.
- [40] ———, *Implementation of a multigrid algorithm on SUPRENUM and other systems*, Parallel Comput., 20 (1994), pp. 1547–1557.
- [41] M. B. ALLEN AND M. C. CURRAN, *A multigrid-based solver for mixed finite-element approximations*, in Computational Methods in Water Resources IX, Vol. I: Numerical Methods in Water Resources, T. F. R. et al, ed., Elsevier Applied Science, London, 1992, pp. 579–585.
- [42] M. B. ALLEN, R. E. EWING, AND P. LU, *Well conditioned iterative schemes for mixed finite element models of porous media flows*, SIAM J. Sci. Stat. Comput., 13 (1992), pp. 794–814.
- [43] M. P. ALLEN, *Simulation of condensed phases using the distributed array processor*, Theor. Chim. Acta, 84 (1993), pp. 399–411.
- [44] F. J. D. ALMEIDA, R. M. MORRA, AND R. F. WILLIS, *Heterodyne technique for potential modulation differentiation*, Rev. Sci. Instrum., 62 (1991), pp. 1475–1480.
- [45] K. AMARATUNGA AND J. R. WILLIAMS, *Wavelet based Green's function approach to 2D PDEs*, Eng. Comput., 10 (1993), pp. 349–367.
- [46] A. A. AMERI AND E. STEINTHORSSON, *Prediction of unshrouded rotor blade tip heat transfer*, in Proceedings of the International Gas Turbine and Aeroengine Congress and Exposition, vol. 95-GT-142, New York, 1995, American Society of Mechanical Engineers, p. 9.
- [47] A. AMIN, P. SADAYAPPAN, AND M. GUDAVALLI, *Clustered reduced communication element by element preconditioned conjugate gradient algorithm for finite element computations*, in Proceedings of the International Conference on Parallel Processing 1994, IEEE Service Center, Piscataway, 1994, IEEE, pp. 509–516.
- [48] S. AMINI AND C. KE, *Multigrid solution of boundary integral reformulation of the time-harmonic acoustic wave scattering problem in a non-smooth domain*, in Mathematical and Numerical Aspects of Wave Propagation Phenomena, G. Cohen, L. Halpern, and P. Joly, eds., SIAM, Philadelphia, 1991, pp. 64–71.
- [49] P. AMODIO, R. W. W. J. R. CAS AND, G. ROUSSE AND, G. FAIRWEATHER, I. GLADWELL, G. L. KRAUT, AND M. PAPRZYCKI, *Almost block diagonal linear systems: sequential and parallel solution techniques, and applications*, Numer. Lin. Alg. Appl., 7 (2000), pp. 275–317.
- [50] J. V. AN K. RIEMSLAGH, B. MERCI, AND E. DICK, *Treatment of all speed flows and high aspect ratios in CFD applications*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer–Verlag, pp. 256–263.
- [51] G. ANAGNOSTOU, Y. MADAY, C. MAVRIPLIS, AND A. T. PATERA, *On the mortar element method: generalizations and implementation*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1990, SIAM, pp. 157–173.
- [52] P. ANCEAUX, G. GAY, R. GLOWINSKI, AND J. PÉRIAUX, *Résolution spectrale du problème de Stokes et coordination*, in Spectral Methods in Computational Fluid Mechanics, vol. 159 of Euromechanics, Nice, 1982.
- [53] C. R. ANDERSON, *Domain decomposition techniques and the solution of Poisson's equation in infinite domains*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 129–139.

- [54] ———, *An implementation of the fast multipole method without multipoles*, SIAM J. Sci. Stat. Comput., 13 (1992), pp. 923–947.
- [55] D. A. ANDERSON, J. C. TANNEHILL, AND R. H. PLETSCHER, *Computational fluid mechanics and heat transfer*, Series in Computational Methods in Mechanics and Thermal Sciences, Hemisphere, Philadelphia, 1984, pp. 63–66.
- [56] W. K. ANDERSON, R. D. RAUSCH, AND D. L. BONHAUS, *Implicit/multigrid algorithms for incompressible turbulent flows on unstructured grids*, J. Comput. Phys., 128 (1996), pp. 391–408.
- [57] W. K. ANDERSON, J. L. THOMAS, AND B. LEER, *Comparison of finite-volume flux-splitting methods for the Euler equations*, AIAA J., 24, no. 9 (1986), pp. 1453–1460.
- [58] W. K. ANDERSON, J. L. THOMAS, AND C. L. RUMSEY, *Extension and application of flux-vector splitting t calculation on dynamic meshes*, AIAA, 87–1152 CP (1987).
- [59] W. K. ANDERSON, J. L. THOMAS, AND D. L. WHITFIELD, *Multigrid acceleration of the flux-split Euler equations*, AIAA J., 26 (1988), pp. 649–654.
- [60] L. ANGERMANN, *Balanced a posteriori error estimates for finite-volume type discretizations of convection-dominated elliptic problems*, Computing, 55 (1995), pp. 305–323.
- [61] P. ANGOT, J. P. CALTAGIRONE, AND K. KHADRA, *Une m'thode adaptative de raffinement local: la correction du flux 'a l'interface*, C.R. Acad. Sci. Paris, t. 315, Serie I (1992), pp. 739–745.
- [62] P. ANGOT AND M. LAUGIER, *The FIC method of conservative connection between nested sub-domains for an ocean circulation model*, C.R. Acad. Sci. II, Mec. Phys. Chim. Astron., 319 (1994), pp. 993–1000.
- [63] F. ANGRAND, A. DERVIEUX, J. A. DESIDERI, AND R. GLOWINSKI, *Numerical Methods for the Euler Equations of Fluid Dynamics*, vol. 21 of Proceedings in Applied Mathematics, SIAM, Philadelphia, 1985.
- [64] F. ANGRAND AND J. ERHEL, *Vectorised finite-element codes for compressible flows*, in Finite Element in Flow Problems, F. Antibes, ed., New York, 1988, John Wiley & Son.
- [65] C. ARAKAWA, A. O. DEMUREN, W. RODI, AND B. SCHÖNUNG, *Application of multigrid method for the coupled and decoupled solution of the incompressible N-S equations*, in Proc. 7th GAMM Conf. on Num. Meth. in Fluid Mechanics, M. Deville, ed., vol. 20 of Notes on Num. Fluid Mechanics, Braunschweig, 1988, Vieweg, pp. 1–8.
- [66] P. ARBENZ AND W. GANDER, *Direct methods for banded linear systems on massively parallel processor computers*, in Parallel Processing for Scientific Computing, SIAM Proceedings, Philadelphia, 1995, SIAM, pp. 506–507.
- [67] E. ARIAN AND S. TA’ASAN, *Smoothers for optimization problems*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 15–30.
- [68] R. ARINA AND C. CANUTO, *Self-adaptive domain decomposition via the X-formulation*, in Computational Mathematics and Applications. 8th France–U.S.S.R.–Italy Joint Symposium Proceedings, Pavia, Italy, 1989, Pubblicazioni dell’Istituto di Analisi Numerica, pp. 1–15.
- [69] ———, *A self adaptive domain decomposition for the viscous/inviscid coupling. I. Burgers equation*, J. Comput. Phys., 105 (1993), pp. 290–300.
- [70] ———, *A X-formulation of the viscous-inviscid domain decomposition for the Euler/Navier-Stokes equations*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 453–458.
- [71] M. ARIOLI AND C. FASSINO, *Roundoff error analysis of algorithms based on Krylov subspace methods*, BIT, 36 (1996), pp. 189–205.
- [72] B. ARLINGER, *Axisymmetric transonic flow computations using a multigrid method*, in Proc. Seventh International Conference on Numerical Methods in Fluid Dynamics, W. C. Reynolds and R. W. MacCormack, eds., vol. 141 of Lecture Notes in Physics, Berlin, 1981, Springer-Verlag, pp. 55–60.
- [73] S. W. ARMFIELD, *Finite difference solutions of the Navier-Stokes equations on staggered and non-staggered grids*, Computer Fluids, 20 (1991), pp. 1–17.
- [74] D. N. ARNOLD AND F. BREZZI, *Mixed and nonconforming finite element methods: implementation, postprocessing and error estimates*, Modél. Math. Anal. Numér., 19 (1985), pp. 7–32.
- [75] D. N. ARNOLD, R. S. FALK, AND R. WINTHER, *Preconditioning discrete approximations of the Reissner–Mindlin plate model*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 215–221.

- [76] ———, *Preconditioning in $H(\text{div})$ and applications*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 12–19.
- [77] A. ARNONE, *Viscous analysis of three-dimensional rotor flow using a multigrid method*, J. Turbomachinery, Trans. ASME, 116 (1994), pp. 435–445.
- [78] A. ARNONE, P. BONCINELLI, AND M. MARCONCINI, *Turbomachinery computations on parallel computers using a multigrid method*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 44–51.
- [79] A. ARNONE, M.-S. LIOU, AND L. A. POVINELLI, *Multigrid calculation of three-dimensional viscous cascade flows*, J. Propul. Power, 9 (1993), pp. 605–614.
- [80] ———, *Integration of Navier–Stokes equations using dual time stepping and a multigrid method*, AIAA J., 33 (1995), pp. 985–990.
- [81] A. ARNONE AND R. PACCIANI, *Rotor-stator interaction analysis using the Navier–Stokes equations and a multigrid method*, in Proceedings of the International Gas Turbine and Aeroengine Congress and Exposition, vol. 95-GT-177, New York, 1995, American Society of Mechanical Engineers, p. 15.
- [82] A. ARNONE, R. PACCIANI, AND A. SESTINI, *Multigrid computations of unsteady rotor–stator interaction using the Navier–Stokes equations*, in Proceedings of the 1994 International Mechanical Engineering Congress and Exposition. Unsteady Flows in Aeropropulsion American Society of Mechanical Engineers, Aerospace Division, vol. 40, New York, NY, 1994, ASME, pp. 87–96.
- [83] A. ARNONE AND A. SESTINI, *Multigrid heat transfer calculations using different iterative schemes*, Numer. Heat Transf. B, Fundam., 19 (1991), pp. 1–11.
- [84] M. T. ARTHUR, *A generalisation of Halls’s scheme for solving the Euler equations for two-dimensional flows*, in Multigrid Methods II, W. Hackbusch and U. Trottenberg, eds., vol. 110, St. Augustin, 1986, GMD.
- [85] M. T. ARTHUR, T. A. BLAYLOCK, AND J. M. ANDERSON, *Cell vertex, multigrid Euler scheme for use with multiblock grids*, AIAA J., 29 (1991), pp. 507–514.
- [86] S. J. ARTHUR AND S. A. E. G. FALLE, *Multigrid methods applied to an explosion at a plane density interface*, Mon. Not. R. Astron. Soc., 251 (1991), pp. 93–104.
- [87] U. M. ASCHER, *Global optimization in surface approximation with discontinuities*, in Advances in Optimization and Parallel Computing, P. Pardalos, ed., Elsevier, 1992, pp. 42–55.
- [88] U. M. ASCHER AND P. M. CARTER, *A multigrid method for shape from shading*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 2, Denver, 1991, University of Colorado, pp. 245–261.
- [89] ———, *A multigrid method for shape-from-shading*, SIAM J. Numer. Anal., 30 (1993), pp. 102–115.
- [90] S. F. ASHBY AND R. D. FALGOUT, *A parallel multigrid preconditioned conjugate gradient algorithm for groundwater flow simulations*, Nucl. Sci. Eng., 124 (1996), pp. 145–159.
- [91] S. F. ASHBY, C. T. KELLEY, P. E. Saylor, AND J. S. SCROGGS, *Preconditioning via asymptotically-defined decomposition*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 139–150.
- [92] S. F. ASHBY, T. A. MANTEUFFEL, AND P. E. Saylor, *A taxonomy for conjugate gradient methods*, SIAM J. Numer. Anal., 27 (1990), pp. 1542–1568.
- [93] C. ASHCRAFT AND J. W. H. LIU, *Using domain decomposition to find graph bisectors*, BIT, 37 (1997), pp. 506–534.
- [94] E. J. ASSELT, *The multi grid method and artificial viscosity*, in Multigrid Methods, W. Hackbusch and U. Trottenberg, eds., vol. 960 of Lecture Notes in Mathematics, Berlin, 1982, Springer-Verlag, pp. 313–326.
- [95] G. P. ASTRAKHANTSEV, *An iterative method of solving elliptic net problems*, Z. Vycisl. Mat. i. Mat. Fiz., 11 (1971), pp. 439–448.
- [96] ———, *Iterative methods for Solving Variational Difference schemes for Two-Dimensional Second-Order Elliptic Equations*, PhD thesis, LOMI Akad. Natuk SSSR, Leningrad, 1971.
- [97] ———, *Methods of fictitious domains for a second order elliptic equation with natural boundary conditions*, U.S.S.R. Comput. Math. and Math. Phys., 18 (1978), pp. 114–121.
- [98] G. P. ASTRAKHANTSEV AND L. A. RUKHOVETS, *Fedorenko’s method for variational difference schemes with extrapolation*, in Variational Difference Methods in Mathematical Physics, Proceedings, V. I. Lebedev, ed., Novosibirsk, 1981, AN SSSR, pp. 20–26.

- [99] ———, *A relaxation method in a sequence of grids for elliptic equations with natural boundary condition*, Z. Vycisl. Mat. i. Mat. Fiz., 21 (1981), pp. 926–944.
- [100] C. ATAMIAN, *Resolution de Problèmes de Diffraction d’Ondes Acoustiques et Electromagnétiques en Régime Fréquentiel par une Méthode de Domaines Fictifs*, PhD thesis, Université Pierre et Marie Curie, Paris, 1991.
- [101] C. ATAMIAN, Q. V. DINH, R. GLOWINSKI, J. HE, AND J. PÉRIAUX, *Control approach to fictitious-domain methods application to fluid dynamics and electro-magnetics*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 275–309.
- [102] H. L. ATKINS, *A multigrid method for the Euler and Navier-Stokes equations for three-dimensional flows*, AIAA, 91-101 (1991).
- [103] I. ATLAS AND K. BURRAGE, *A high accuracy defect correction multigrid method for the steady incompressible Navier Stokes equations*, J. Comput. Phys., 114 (1994), pp. 227–233.
- [104] A. AUGE, A. KAPURKIN, G. LUBE, AND F. C. OTTO, *A note on domain decomposition of singularly perturbed elliptic problems*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 163–170.
- [105] A. AUGE, G. LUBE, AND D. WEISS, *Galerkin/least-squares-FEM and anisotropic mesh refinement*, in Adaptive Methods – Algorithms, Theory and Applications, vol. 46 of Notes on Numerical Fluid Mechanics, Braunschweig, 1994, Vieweg, pp. 1–16.
- [106] J. M. AUGENBAUM, *Multidomain adaptive pseudospectral methods for acoustic wave propagation in discontinuous media*, Comp. Acoustics, 3 (1990), pp. 19–40.
- [107] W. AUZINGER AND H. J. STETTER, *Defect correction and multigrid iterations*, in Multigrid Methods, W. Hackbusch and U. Trottenberg, eds., vol. 960 of Lecture Notes in Mathematics, Berlin, 1982, Springer-Verlag, pp. 327–351.
- [108] A. AVERBUCH, E. GABBER, S. ITZIKOWITZ, AND B. SHOHAM, *On the parallel elliptic single/multigrid solutions about aligned and nonaligned bodies using the virtual machine for multiprocessors*, Scientific Programming, 3 (1994), pp. 13–32.
- [109] A. AVERBUCH, M. ISRAELI, AND L. VOZOVOI, *Parallel implementation of non linear evolution problems using parabolic domain decomposition*, Parallel Comput., 21 (1995), pp. 1151–1183.
- [110] A. AVERBUCH, K. RUVINSKY, M. ISRAELI, AND L. VOZOVOI, *Parallel implementation of multidomain Fourier algorithms for 2D and 3D Navier-Stokes equations*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 433–441.
- [111] O. AXELSSON, *On multigrid methods of the two-level type*, in Multigrid Methods, W. Hackbusch and U. Trottenberg, eds., vol. 960 of Lecture Notes in Mathematics, Berlin, 1982, Springer-Verlag, pp. 352–367.
- [112] ———, *A mixed variable finite element method for the efficient solution of nonlinear diffusion and potential flow equations*, in Advances in Multi-Grid Methods, D. Braess, W. Hackbusch, and U. Trottenberg, eds., vol. 11 of Notes on Numerical Fluid Mechanics, Braunschweig, 1985, Vieweg, pp. 1–11.
- [113] ———, *An algebraic framework for hierarchical basis function multilevel methods or the search for ‘optimal’ preconditioners*, in Iterative Methods for Large Linear Systems, Academic Press, New York, 1990, pp. 7–40.
- [114] ———, *Iterative Solution Methods*, Cambridge University Press, Cambridge, 1994.
- [115] ———, *Stabilization of algebraic multilevel iteration; additive methods*, in AMLI’96: Proceedings of the Conference on Algebraic Multilevel Iteration Methods with Applications, vol. 1, Nijmegen, The Netherlands, 1996, University of Nijmegen, pp. 49–62.
- [116] ———, *The stabilized V cycle method*, J. Comput. Appl. Math., 74 (1996), pp. 33–50.
- [117] O. AXELSSON AND V. EIJKHOUT, *The nested recursive two-level factorization method for nine-point difference matrices*, SIAM J. Sci. Stat. Comput., 12 (1991), pp. 1373–1400.
- [118] O. AXELSSON AND I. GUSTAFSSON, *Preconditioning and two-level multigrid methods of arbitrary degree of approximation*, Math. Comp., 40 (1983), pp. 219–242.
- [119] O. AXELSSON AND M. NEYTCHEVA, *The algebraic multilevel iteration methods - theory and applications*, in Proceedings of the Second International Colloquium in Numerical Analysis, August 14-18, 1993, Plovdiv, Bulgaria, 1993, pp. 13–23.
- [120] ———, *Algebraic multilevel iteration method for Stieltjes matrices*, Numer. Lin. Alg. Appl., 1 (1994), pp. 213–236.
- [121] ———, *Scalable algorithms for the solution of Navier’s equations of elasticity*, J. Comp. Appl. Math., 63 (1995), pp. 149–178.

- [122] O. AXELSSON AND B. POLMAN, *Block preconditioning and domain decomposition methods, II*, J. Comput. Appl. Math., 24 (1988), pp. 55–72.
- [123] ———, *A robust preconditioner based on algebraic substructuring and two-level grids*, in Robust Multi-Grid Methods, W. Hackbusch, ed., vol. 23 of Notes on Numerical Fluid Mechanics, Braunschweig, 1989, Vieweg, pp. 1–26.
- [124] ———, *AMLI'96: Proceedings of the Conference on Algebraic Multilevel Iteration Methods with Applications*, University of Nijmegen, Nijmegen, The Netherlands, 1996.
- [125] O. AXELSSON AND P. S. VASSILEVSKI, *Algebraic multilevel preconditioning methods, I*, Numer. Math., 56 (1989), pp. 157–177.
- [126] ———, *A survey of multilevel preconditioned iterative methods*, BIT, 29 (1989), pp. 769–793.
- [127] ———, *Algebraic multilevel preconditioning methods. Part II*, SIAM J. Numer. Anal., 27 (1990), pp. 1569–1590.
- [128] ———, *Algebraic multilevel preconditioning methods, III*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 163–177.
- [129] ———, *Asymptotic work estimates for AMLI methods*, Appl. Numer. Math., 7 (1991), pp. 437–451.
- [130] ———, *Variable-step multilevel preconditioning methods, I: selfadjoint and positive definite elliptic problems*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 2, Denver, 1991, University of Colorado, pp. 319–341.
- [131] O. A. AXELSSON AND V. A. BARKER, *Finite Element Solution of Boundary Value Problems*, Academic Press, New York, 1984.
- [132] C. AYKANAT, F. OZGU, F. ERCAL, AND P. SADAYAPPAN, *Iterative algorithms for solution of large sparse systems of linear equations on hypercubes*, IEEE Trans. Comput., 27, no. 12 (1988), pp. 1554–1568.
- [133] M. AZAIEZ AND A. QUARTERONI, *A spectral Stokes solver in domain decomposition methods*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 151–156.
- [134] K. AZIZ AND A. SETTARI, *Petroleum reservoir simulation*, Applied Science Publishers, London, 1979.
- [135] N. BAAZIZ AND C. LABIT, *Multiconstraint wiener based motion compensation using wavelet pyramids*, IEEE Trans. Image Process, 3 (1994), pp. 688–692.
- [136] I. BABUŠKA, *On the Schwarz algorithm in the theory of differential equations of mathematical physics*, Tchecosl. Math. J., 8 (1958), pp. 328–342.
- [137] ———, *Finite element methods for domains with corners*, Computing, 6 (1970), pp. 264–273.
- [138] ———, *Error bounds for the finite element method*, Numer. Math., 16 (1971), pp. 322–333.
- [139] ———, *The p and h-p versions of the finite element method: The state of the art*, in Finite Elements, Theory and Applications, D. L. Dwyer, M. Y. Hussaini, and R. G. Voigt, eds., Springer-Verlag, New York, 1988.
- [140] I. BABUŠKA AND A. K. AZIZ, *Survey lectures on the mathematical foundation of the finite element method*, in The Mathematical Foundation of the Finite Element Method with Applications to Partial Differential Equations, A. K. Aziz, ed., Academic Press, New York, 1972, pp. 3–359.
- [141] I. BABUŠKA, A. W. CRAIG, J. MANDEL, AND J. PITKÄRANTA, *Efficient preconditioning for the p-version finite element method in two dimensions*, SIAM J. Numer. Anal., 28 (1991), pp. 624–662.
- [142] I. BABUŠKA AND M. R. DORR, *Error estimates for the combined h and p versions of the finite element method*, Numer. Math., 37 (1981), pp. 257–277.
- [143] I. BABUŠKA, M. GRIEBEL, AND J. PITKÄRANTA, *The problem of selecting the shape functions for a p-type finite element*, Int. J. Numer. Meth. Engng., 28 (1989), pp. 1891–1908.
- [144] I. BABUŠKA AND M. SURI, *The h-p version of the finite element method with quasiuniform meshes*, RAIRO Math. Mod. and Num. Anal., 21 (1987).
- [145] ———, *The optimal convergence rate of the p-version of the finite element method*, SIAM J. Numer. Anal., 24 (1987), pp. 750–776.
- [146] I. BABUŠKA, B. A. SZABØ, AND I. N. KATZ, *The p-version of the finite element method*, SIAM J. Numer. Anal., 18 (1981), pp. 515–545.
- [147] I. BABUŠKA, *Über Schwarzsche Algorithmen in partielle Differentialgleichungen der mathematischen Physik*, ZAMP, 37 (1957), pp. 243–245.

- [148] B. BACHMANN, *Adaptive Mehrgitterverfahren zur Lösung der stationären Halbleitergleichungen*, PhD thesis, Universität Zürich, 1993.
- [149] B. BACHMANN AND A. B. BOVERI, *A multigrid solver for the semiconductor equations*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 1–15.
- [150] L. BADEA, *On the Schwarz alternating method with more than two subdomains for nonlinear monotone problems*, SIAM J. Numer. Anal., 28 (1991), pp. 179–204.
- [151] L. BADEA AND P. GIORMINI, *Application of a domain decomposition method to elastoplastic problems*, Int. J. Solids Struct., 31 (1994), pp. 643–656.
- [152] S. B. BADEN, *Structured Adaptive Mesh Refinement (Samr) Grid Methods*, vol. 117 of Ima Volumes in Mathematics and Its Applications, Springer– Verlag, New York, 1999.
- [153] M. BAEKER, *ISU – multigrid for computing propagators*, Nucl. Phys. B, Proc. Suppl., 42 (1995), pp. 846–848.
- [154] D. BAI AND A. BRANDT, *Local mesh refinement multilevel techniques*, SIAM J. Sci. Stat. Comput., 8 (1987), pp. 109–134.
- [155] L. BAI, N. K. MITRA, M. FIEBIG, AND A. KOST, *A multigrid method for predicting periodically fully developed flow*, Int. J. Numer. Meth. Fluids, 18 (1994), pp. 843–852.
- [156] X.-S. BAI AND L. FUCHS, *A fast multi-grid method for 3-D turbulent incompressible flows*, Int. J. of Numer. Meth. Heat Fluid Flow, 2 (1992).
- [157] ———, *Modelling of turbulent reacting flows past a bluff body: Assessment of accuracy and efficiency*, Computer Fluids, 23 (1994), pp. 507–521.
- [158] ———, *A multi-grid method for calculation of turbulence and combustion*, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 131–142.
- [159] Z.-Z. BAI, *A class of hybrid algebraic multilevel preconditioning methods*, Appl. Numer. Math., 19 (1996), pp. 389–399.
- [160] Z.-Z. BAI AND O. AXELSSON, *A unified framework for the construction of various algebraic multilevel preconditioning methods*, in AMLI'96: Proceedings of the Conference on Algebraic Multilevel Iteration Methods with Applications, vol. 1, Nijmegen, The Netherlands, 1996, University of Nijmegen, pp. 63–76.
- [161] D. H. BAILEY, P. E. BJORSTAD, J. R. GILBERT, M. D. MASCAGNI, R. SCHRIEBER, H. D. SIMON, V. J. TORCZON, AND L. T. WATSON, eds., *Parallel Processing for Scientific Computing*, SIAM Proceedings, Philadelphia, 1995, SIAM.
- [162] M. BÄKER, *Localization in two dimensional SU(2) lattice gauge theory and a new multigrid method*, Int. J. Mod. Phys. C, (Phys. Comput.), 6 (1995), pp. 85–104.
- [163] M. BÄKER, G. MACK, AND M. SPEH, *Multigrid meets neural nets*, Nucl. Phys. B, Proc. Suppl., 30 (1993), pp. 269–272.
- [164] N. S. BAKHVALOV, *On the convergence of a relaxation method under natural constraints on an elliptic operator*, Z. Vycisl. Mat. i. Mat. Fiz., 6 (1966), pp. 861–883.
- [165] N. S. BAKHVALOV AND A. V. KNYAZEV, *Preconditioned iterative methods in a subspace for linear algebraic equations with large jumps in the coefficients*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 157–162.
- [166] N. S. BAKHVALOV AND A. V. KNYAZEV, *A new iterative algorithm for solving the fictitious fluxes method problems for elliptic equations*, in Proc. EQUADIFF 7, Prague, 1989.
- [167] ———, *A new iterative algorithm for solving problems of the fictitious flow method for elliptic equations*, Soviet Math. Doklady, 41 (1990), pp. 57–62.
- [168] ———, *Fictitious domain methods and computation of homogenized properties of composites with a periodic structure of essentially different components*, in Numerical Methods and Applications, CRC Press, Boca Raton, 1994, pp. 221–276.
- [169] N. S. BAKHVALOV, A. V. KNYAZEV, AND G. M. KOBEL'KOV, *Iterative methods for solving equations with highly varying coefficients*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 197–205.
- [170] N. S. BAKHVALOV AND M. Y. OREKHOV, *On fast methods for solving the Poisson equation*, Z. Vycisl. Mat. i. Mat. Fiz., 22 (1982), pp. 1386–1392.
- [171] E. BALAS, *Solution of large-scale transportation problems through aggregation*, ORSA, (1965).
- [172] B. S. BALDWIN AND H. LOMAX, *Thin layer approximation and algebraic model for separated*

turbulent flows, AIAA, 78–257 (1978).

- [173] V. BANDY AND R. SWEET, *A set of three drivers for boxmg: a black box multigrid solver*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 1, Denver, 1991, University of Colorado, pp. 47–55.
- [174] ———, *A set of three drivers for BOXMG: A black-box multigrid solver*, Comm. Appl. Num. Methods, 8 (1992), pp. 563–571.
- [175] R. N. BANERJEE AND M. W. BENSON, *An approximate inverse based multigrid approach to the biharmonic problem*, Int. J. Comput. Math., 40 (1991), pp. 201–210.
- [176] R. E. BANK, *Marching Algorithms for Elliptic Boundary Value Problems*, PhD thesis, Division of Engineering and Applied Physics, Harvard University, Cambridge, MA, 1975.
- [177] ———, *A comparison of two multi-level iterative methods for nonsymmetric an indefinite elliptic finite element equations*, SIAM J. Numer. Anal., 18 (1981), pp. 724–743.
- [178] ———, *A multi-level iterative method for nonlinear elliptic equations*, in Elliptic Problem Solvers, M. H. Schultz, ed., Academic Press, New York, 1981, pp. 1–16.
- [179] ———, *A multi-level iterative method for nonlinear elliptic equations*, in Elliptic Problem Solvers, M. H. Schultz, ed., Academic Press, New York, 1981, pp. 1–16.
- [180] ———, *Analysis of a multi-level inverse iteration procedure for eigenvalue problems*, SIAM J. Numer. Anal., 19 (1982), pp. 886–898.
- [181] ———, *Efficient implementation of local mesh refinement algorithms*, in Adaptive Computational Methods for Partial Differential Equations, I. Babuška, J. Chandra, and J. E. Flaherty, eds., SIAM, Philadelphia, 1984, pp. 74–81.
- [182] ———, *A-posteriori error estimates, adaptive local mesh refinement, and multigrid iteration*, in Multigrid Methods II, W. Hackbusch and U. Trottenberg, eds., Berlin, 1986, Springer-Verlag, pp. 7–22.
- [183] ———, *Analysis of a local a posteriori error estimator for elliptic equations*, in Accuracy Estimates and Adaptivity in Finite Element Computations, J. Wiley & Sons, New York, 1986, pp. 119–128.
- [184] ———, *Computational Aspects of VLSI Design with an Emphasis on Semiconductor Device Simulation*, vol. 25 of Lecture Notes in Applied Math., American Mathematical Society, Providence, 1990.
- [185] ———, *PLTMG: A Software Package for Solving Elliptic Partial Differential Equations – Users' Guide 6.0*, vol. 7 of Frontiers in Applied Mathematics, SIAM Books, Philadelphia, 1990.
- [186] ———, *Hierarchical preconditioners for elliptic partial differential equations*, in Large Scale Matrix Problems and the Numerical Solution of Partial Differential Equations, Oxford University Press, Oxford, UK, 1994, pp. 121–155.
- [187] ———, *PLTMG: A Software Package for Solving Elliptic Partial Differential Equations – Users' Guide 7.0*, vol. 15 of Frontiers in Applied Mathematics, SIAM Books, Philadelphia, 1994.
- [188] ———, *Hierarchical bases and the finite element method*, vol. 5 of Acta Numerica, Cambridge University Press, Cambridge, 1996, pp. 1–43.
- [189] R. E. BANK AND M. BENBOURENANE, *A Fourier analysis of the two-level hierarchical basis multigrid method for convection–diffusion equations*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 178–184.
- [190] ———, *The hierarchical basis multigrid method for convection–diffusion equations*, Numer. Math., 61 (1992), pp. 7–37.
- [191] R. E. BANK, R. BULIRSCH, H. GAJEWSKI, AND K. MERTEN, *Mathematical Modelling and Simulation of Electrical Circuits and Semiconductor Devices*, vol. 117 of Int. Series Numer. Math., Birkhäuser, Basel, 1994.
- [192] R. E. BANK, R. BULIRSCH, AND K. MERTEN, *Mathematical Modelling and Simulation of Electrical Circuits and Semiconductor Devices*, vol. 93 of Int. Series Numer. Math., Birkhäuser, Basel, 1990.
- [193] R. E. BANK AND T. F. CHAN, *PLTMGC: A multi-grid continuation program for parameterized nonlinear elliptic systems*, SIAM J. Sci. Stat. Comput., 7 (1986), pp. 540–559.
- [194] ———, *An analysis of the composite step bi-conjugate gradient method*, Numer. Math., 66 (1993), pp. 295–319.
- [195] ———, *A composite step bi-conjugate gradient algorithm for nonsymmetric linear systems*, Numer. Algor., 7 (1994), pp. 1–16.
- [196] R. E. BANK, T. F. CHAN, W. M. COUGHRAN, AND R. K. SMITH, *The alternating-block-*

- factorization procedure for systems of partial differential equations, BIT, 29 (1989), pp. 938–954.
- [197] R. E. BANK AND C. C. DOUGLAS, Sharp estimates for multigrid rates of convergence with general smoothing and acceleration, SIAM J. Numer. Anal., 22 (1985), pp. 617–633.
 - [198] R. E. BANK AND T. DUPONT, An optimal order process for solving elliptic finite element equations, Math. Comp., 36 (1981), pp. 35–51.
 - [199] R. E. BANK, T. DUPONT, AND H. YSERENTANT, The hierarchical basis multigrid method, Numer. Math., 52 (1988), pp. 427–458.
 - [200] R. E. BANK AND S. GUTSCH, Hierarchical basis for the convection-diffusion equation on unstructured meshes, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 251–265.
 - [201] ———, The generalized hierarchical basis two-level method for the convection-diffusion equation on a regular grid, in Multigrid Methods V, vol. 3 of Lecture Notes in Computational Science and Engineering, Berlin, 1998, Springer, pp. 1–20.
 - [202] R. E. BANK, J. W. JEROME, AND D. J. ROSE, Analytical and numerical aspects of semiconductor device modeling, in Computing Methods in Applied Sciences and Engineering V, R. Glowinski and J.-L. Lions, eds., Amsterdam, 1982, North-Holland, pp. 593–597.
 - [203] R. E. BANK, J. MANDEL, AND S. F. MCCORMICK, Variational multigrid theory, in Multigrid Methods, SIAM, Philadelphia, 1985, pp. 131–178.
 - [204] R. E. BANK AND H. D. MITTELMANN, Continuation and multi-grid for nonlinear elliptic systems, in Multigrid Methods II, W. Hackbusch and U. Trottenberg, eds., Berlin, 1986, Springer-Verlag, pp. 23–37.
 - [205] ———, Stepsize selection in continuation procedures and damped Newton’s method, J. Comp. and Appl. Math., 26 (1989), pp. 67–78.
 - [206] R. E. BANK AND D. J. ROSE, Global approximate Newton methods, Numer. Math., 37 (1981), pp. 279–295.
 - [207] ———, Analysis of a multilevel iterative method for nonlinear finite element equations, Math. Comp., 39 (1982), pp. 453–465.
 - [208] ———, Discretization and multilevel solution techniques for nonlinear elliptic systems, in Elliptic Problem Solvers II, G. Birkhoff and A. Schoenstadt, eds., Academic Press, New York, 1984, pp. 493–505.
 - [209] ———, Some error estimates for the box scheme, SIAM J. Numer. Anal., 24 (1987), pp. 777–787.
 - [210] R. E. BANK AND R. F. SANTOS, Analysis of some moving space-time finite element methods, SIAM J. Numer. Anal., 30 (1993), pp. 1–18.
 - [211] R. E. BANK AND L. R. SCOTT, On the conditioning of finite element equations with highly refined meshes, SIAM J. Numer. Anal., 26 (1989), pp. 1383–1394.
 - [212] R. E. BANK AND A. H. SHERMAN, Algorithmic aspects of the multi-level solution of finite element equations, in Sparse Matrix Proceedings 1978, I. S. Duff and G. W. Stewart, eds., Philadelphia, 1979, SIAM, pp. 62–89.
 - [213] ———, A comparison of smoothing iterations for multi-level methods, in Advances in Computer Methods for Partial Differential Equations III, R. Vichnevetsky and R. S. Stepleman, eds., IMACS, New York, 1979, pp. 143–147.
 - [214] ———, A multi-level iterative method for solving finite element equations, in Proceedings of the Fifth Symposium on Reservoir Simulation, Dallas, 1979, Society of Petroleum Engineers of AIME, pp. 117–126.
 - [215] ———, The use of adaptive grid refinement for badly behaved elliptic partial differential equations, in Mathematics and Computers in Simulation, XXII, North-Holland, Amsterdam, 1980, pp. 18–24.
 - [216] ———, An adaptive multi-level method for elliptic boundary value problems, Computing, 26 (1981), pp. 91–105.
 - [217] R. E. BANK, A. H. SHERMAN, AND A. WEISER, On the regularity of local mesh refinement, in Proceedings of the IMACS Tenth World Conference, New Brunswick, NJ, 1982, IMACS.
 - [218] ———, Refinement algorithms and data structures for regular local mesh refinement, in Scientific Computing: Applications of Mathematics and Computing to the Physical Sciences, R. S. Stepleman, ed., North-Holland, Amsterdam, 1983, pp. 3–17.
 - [219] R. E. BANK AND R. K. SMITH, A posteriori estimates based on hierarchical basis, SIAM J. Numer. Anal., 30 (1993), pp. 921–935.
 - [220] ———, Mesh smoothing using a posteriori error estimates, SIAM J. Numer. Anal., 34 (1997), pp. 979–997.
 - [221] R. E. BANK AND A. WEISER, Some a posteriori error estimators for elliptic partial differential equations, Math. Comp., 44 (1985), pp. 283–301.

- [222] R. E. BANK, B. D. WELFERT, AND H. YSERENTANT, *A class of iterative methods for solving mixed finite element equations*, Numer. Math., 56 (1990), pp. 645–666.
- [223] R. E. BANK AND J. XU, *The hierarchical basis multigrid method and incomplete LU decomposition*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 163–173.
- [224] ———, *A hierarchical basis multigrid method for unstructured grids*, in Fast Solvers for Flow Problems. Proceedings of the Tenth GAMM-Seminar Kiel, vol. 49 of Notes on Numerical Mathematics, Vieweg-Verlag, Braunschweig, 1995, pp. 1–13.
- [225] ———, *An algorithm for coarsening unstructured meshes*, Numer. Math., 73 (1996), pp. 1–36.
- [226] R. E. BANK AND H. YSERENTANT, *Some remarks on the hierarchical basis multigrid method*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 140–146.
- [227] F. BANNASCH, *Mehrgitterverfahren für die dreidimensionale Poissonsleichung*, PhD thesis, Institut für Angewandte Mathematik, Universität Bonn, 1983.
- [228] I. M. BARBOUR, N. E. BEHILIL, P. E. GIBBS, G. SCHIERHOLZ, AND M. TEPER, *The Lanczos method in lattice gauge theories*, in The Recursion Method and its Applications, Springer-Verlag, Berlin, 1985.
- [229] M. BARCUS, M. PERIĆ, AND G. SHEUERER, *A control volume based full multigrid procedure for the prediction of two-dimensional, laminar, incompressible flows*, in Proc. 7th GAMM Conf. on Num. Meth. in Fluid Mechanics, M. Deville, ed., vol. 20 of Notes on Num. Fluid Mechanics, Braunschweig, 1988, Vieweg.
- [230] T. BARCZYK AND R. WIT, *Inversion of the fermionic matrix and multigrid*, Acta Phys. Pol. B, 22 (1991), pp. 623–629.
- [231] D. BARKAI AND A. BRANDT, *Vectorized multigrid Poisson solver for the CDC Cyber 205*, Appl. Math. Comput., 13 (1983), pp. 215–228.
- [232] A. BARKER AND B. GERVANG, *Relaxed ILU preconditioning for the CG solution of a singular boundary value problem*, in Incomplete Decompositions (ILU) – Algorithms, Theory, and Applications, W. Hackbusch and G. Wittum, eds., vol. 41 of Notes on Numerical Fluid Mechanics, Braunschweig, 1993, Vieweg, pp. 1–11.
- [233] S. T. BARNARD AND H. D. SIMON, *A fast multilevel implementation of recursive spectral bisection*, in Proceedings of the Sixth SIAM Conference on Parallel Processing for Scientific Computing, Philadelphia, 1993, SIAM, pp. 711–718.
- [234] E. BARRAGY AND G. F. CAREY, *A parallel element-by-element solution scheme*, Int. J. Numer. Meth. Engng., 26 (1988), pp. 2367–2382.
- [235] ———, *Parallel-vector computation with high degree element-by-element methods*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1990, SIAM, pp. 358–372.
- [236] ———, *Bifurcation detection using the lanczos method and imbedded subspaces*, Impact Comput. Sci. Eng., 3 (1991), pp. 76–92.
- [237] J. W. BARRETT AND K. W. MORTON, *Approximate symmetrization and Petrov–Galerkin methods for diffusion–convection problems*, Comp. Meth. Appl. Mech. Engng., 45 (1984), pp. 97–122.
- [238] K. E. BARRETT, D. M. BUTTERFIELD, S. E. ELLIS, C. J. JUDD, AND J. H. TABOR, *Multigrid analysis of linear elastic stress problems*, in Multigrid Methods for Integral and Differential Equations, D. J. Paddon and H. Holstein, eds., vol. 3 of The Institute of Mathematics and its Applications Conference Series, Clarendon Press, Oxford, 1985, pp. 263–282.
- [239] R. BARRETT, M. BERRY, T. F. CHAN, J. DEMMEL, J. DONATO, J. J. DONGARRA, V. Eijkhout, R. Pozo, C. Romine, AND H. VAN DER VORST, *Templates for the solution of linear systems: building blocks for iterative methods*, SIAM Books, Philadelphia, 1994.
- [240] S. R. M. BARROS AND T. KAURANNE, *Parallelization of global spectral weather models*, Parallel Comput., 20 (1994), pp. 1335–1356.
- [241] E. BARSZCZ, T. F. CHAN, D. C. JESPERSEN, AND R. S. TUMINARO, *FLO52 on hypercubes: performance of a parallel code for the Euler equations on hypercubes*, J. High Speed Comput., 1 (1989), pp. 481–503.
- [242] A. BASERMANN, *Parallel block ILUT/ILDLT preconditioning for sparse eigenproblems and sparse linear systems*, Numer. Lin. Alg. Appl., 7 (2000), pp. 635–648.
- [243] C. BASLER AND W. TORNIG, *On monotone including nonlinear multigrid methods and ap-*

- pllications*, Comput., 50 (1993), pp. 51–67.
- [244] M. BASSETT, *Implementation of multigrid on a hypercube multiprocessor*, in Proceedings of the First Conference on Hypercube Multiprocessors, M. Heath, ed., Philadelphia, 1985, SIAM, pp. 211–220.
- [245] P. BASTIAN, *Locally refined solution of unsymmetric and nonlinear problems*, in Incomplete Decompositions (ILU) – Algorithms, Theory, and Applications, vol. 41 of Notes on Numerical Fluid Mechanics, Braunschweig, 1993, Vieweg, pp. 12–21.
- [246] P. BASTIAN, J. BURMEISTER, AND G. HORTON, *Implementation of a parallel multigrid method for parabolic partial differential equations*, in Parallel Algorithms for PDEs, W. Hackbusch, ed., Wiesbaden, 1990, Vieweg-Verlag, pp. 18–27.
- [247] P. BASTIAN, J. H. FERZIGER, G. HORTON, AND J. VOLKERT, *Adaptive multigrid solution of the convection-diffusion equation on the DIRMU processor*, in Robust Multi-Grid Methods, W. Hackbusch, ed., vol. 23 of Notes on Numerical Fluid Mechanics, Braunschweig, 1989, Vieweg, pp. 27–36.
- [248] P. BASTIAN AND G. HORTON, *Parallelization of robust multigrid methods: ILU factorization and frequency*, SIAM J. Sci. Stat. Comput., 12 (1991), pp. 1457–1470.
- [249] P. BASTIAN AND G. WITTUM, *Adaptive multigrid methods: The UG concept*, in Adaptive Methods – Algorithms, Theory and Applications, vol. 46 of Notes on Numerical Fluid Mechanics, Braunschweig, 1994, Vieweg, pp. 17–37.
- [250] ———, *On robust and adaptive multi-grid methods*, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 1–17.
- [251] J. R. BATES, Y. LI, A. BRANDT, S. F. MCCORMICK, AND J. RUGE, *A global shallow water numerical model based on the semi Lagrangian advection of potential vorticity*, Q. J. R. Meteorol. Soc., 121 (1996), pp. 1981–2005.
- [252] J. R. BATES, S. F. MCCORMICK, J. W. RUGE, D. S. SHOLL, AND I. YAVNEH, *A semi-Lagrangian approach to the shallow water equations*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 593–604.
- [253] R. BATTITI, E. AMALDI, AND C. KOCH, *Computing optical flow across multiple scales: an adaptive coarse to fine strategy*, Int. J. Comput. Vis., 6 (1991), pp. 133–145.
- [254] G. M. BAUDET, *Asynchronous iterative methods for multiprocessors*, J. ACM, 25 (1978), pp. 226–244.
- [255] J. R. BAUMGARTNER, *Three-dimensional treatment of convective flow in the earth's mantle*, J. Stat. Phys., 29 (1985), pp. 501–511.
- [256] A. BAYLISS, T. BELYTSCHKO, D. HANSEN, AND E. TURKEL, *Adaptive multi-domain spectral methods*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 195–203.
- [257] O. BAYSAL, K. FOULADI, AND V. R. LESSARD, *Multigrid and upwind viscous flow solver on three dimensional overlapped and embedded grids*, AIAA J., 29 (1991), pp. 903–910.
- [258] O. BAYSAL, K. FOULADI, R. W. LEUNG, AND J. S. SHEFTIC, *Interference flows past cylinder-fin-sting-cavity assemblies*, J. Aircr., 29 (1992), pp. 194–202.
- [259] O. BAYSAL AND G.-W. YEN, *Kinematic domain decomposition for boundary-motion-induced flow simulations*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 411–419.
- [260] R. BEAUWENS, *Incomplete factorizations with S/P and modified S/P consistently ordered M-factors*, in Incomplete Decompositions (ILU) – Algorithms, Theory, and Applications, W. Hackbusch and G. Wittum, eds., vol. 41 of Notes on Numerical Fluid Mechanics, Braunschweig, 1993, Vieweg, pp. 22–31.
- [261] R. BECK, P. DEUFLHARD, R. HIPTMAIR, R. H. W. HOPPE, AND B. WOHLMUTH, *Adaptive multilevel methods for edge element discretizations of Maxwell's equations*, Surveys Math. Industry, 8 (1999), pp. 271–312.
- [262] R. BECK AND R. HIPTMAIR, *Multilevel solution of the time-harmonic Maxwell equations based on edge elements*, Int. J. Num. Meth. Engr., 45 (1999), pp. 901–920.
- [263] C. BECKER, J. H. FERZIGER, M. PERIC, AND G. SCHEUERER, *Finite volume multigrid solution of the two-dimensional incompressible Navier-Stokes equations*, in Robust Multi-Grid Methods, W. Hackbusch, ed., vol. 23 of Notes on Numerical Fluid Mechanics, Braunschweig, 1989, Vieweg, pp. 37–47.
- [264] K. BECKER, *Mehrgitterverfahren zur Lösung der Helmholtz-Gleichung im Rechteck mit Neumannschen Randbedingungen*, PhD thesis, Institut für Angewandte Mathematik, Uni-

- verstitt Bonn, 1981.
- [265] ———, *Ein Mehrgitterprogramm zur Berechnung subsonischer Potentialstromungen um Tragflachenprofile*, PhD thesis, Institut fr Angewandte Mathematik, Universitt Bonn, 1985.
- [266] ———, *Ein Mehrgitterverfahren zur Losung der vollen Potentialgleichung im Falle transsonischer Stromungen*, in Rechnerarchitekturen fr die numerische Simulation auf der Basis superschneller Losungsverfahren II, U. Trottenberg and P. Wypior, eds., GMD-Studien Nr. 102, Gesellschaft fr Mathematik und Datenverarbeitung, St. Augustin, 1985, pp. 199–210.
- [267] ———, *Multigrid methods for problems from fluid dynamics – Development of a 2D transonic potential flow solver*, in Notes on Numerical Fluid Mechanics, vol. 14, Vieweg–Verlag, Braunschweig, 1986, pp. 1–13.
- [268] ———, *Multigrid acceleration of a 2D full potential flow solver*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 1–21.
- [269] K. BECKER AND U. TROTENBERG, *Fast multigrid methods and applications—a short survey and one result on a special nearly singular problem*, in Proceedings of the Third International Symposium on Numerical Methods in Engineering, P. Lascaux, ed., vol. 1, Paris, 1983, Pluralis, pp. 81–91.
- [270] R. BECKER, C. JOHNSON, AND R. RANNACHER, *Adaptive error control for multigrid finite element methods*, Computing, 55 (1995), pp. 271–288.
- [271] U. BECKER-LEMGAU AND C. MAVRIPLIS, *Spectral element simulations of laminar diffusion flames*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 673–681.
- [272] J. M. BECKERS AND F. SCHMITZ, *The junction: a tool to parallelise ocean models by a domain decomposition, to connect different kind of models and to impose open sea boundary conditions*, in Parallel Processing for Scientific Computing, SIAM Proceedings, Philadelphia, 1995, SIAM, pp. 173–174.
- [273] L. BERNAERT, D. ROOSE, R. STRUYS, AND H. DECONINCK, *A multigrid solver for the Euler equations on the iPSC/2 parallel computer*, Appl. Numer. Math., 7 (1991), pp. 379–398.
- [274] A. BEHIE AND P. A. FORSYTH, *Multi-grid solution of the pressure equation in reservoir simulation*, in Proceedings of the Sixth Annual Meeting of Reservoir Simulation, New Orleans, 1982, Society of Petroleum Engineers.
- [275] ———, *Comparison of fast iterative methods for symmetric systems*, IMA J. Numer. Anal., 3 (1983), pp. 41–63.
- [276] ———, *Multi-grid solution of the pressure equation in reservoir simulation*, Soc. Pet. Eng. J., 23 (1983), pp. 623–632.
- [277] ———, *Multi-grid solution of three-dimensional problems with discontinuous coefficients*, Appl. Math. Comput., 13 (1983), pp. 229–240.
- [278] R. BEINERT AND D. KR/”ONER, *Finite volume methods with local mesh alignment in 2-D*, in Adaptive Methods – Algorithms, Theory and Applications, vol. 46 of Notes on Numerical Fluid Mechanics, Braunschweig, 1994, Vieweg, pp. 38–53.
- [279] J. BELAK, *Harnessing the killer micros: applications from LLNL’s massively parallel computing initiative*, Theor. Chim. Acta, 84 (1993), pp. 315–323.
- [280] B. B. BELFORD AND J. H. E. KAUFMAN, *An application of approximation theory to an error estimate in linear algebra*, Math. Comp., 28 (1974), pp. 711–712.
- [281] F. B. BELGACEM AND S. C. BRENNER, *Some nonstandard finite element estimates with applications to 3D Poisson and Signorini problems*, Elect. Trans. Numer. Anal., 12 (2001), pp. 134–148.
- [282] J. B. BELL, P. COLLELA, AND H. M. GLAZ, *A second-order projection method for the incompressible Navier–Stokes equations*, J. Comput. Phys., 85 (1989), pp. 257–283.
- [283] J. B. BELL AND D. L. MARCUS, *A second-order projection method for variable-density flows*, Commun. Math. Phys., 147 (1992), pp. 371–394.
- [284] K. BELL, B. HATLESTAD, O. E. HANSTEEN, AND P. O. ARALDSSEN, *NORSAM, a programming system for the finite element method. Users manual, part 1, general description*, NTH, Trondheim, Norway, 1973.
- [285] I. BEN-ZVI, *Optimal trajectory planning for robotic manipulators: a multigrid approach*, master’s thesis, The Weizmann INstitute of Science, Rehovot, Israel, 1988.
- [286] J.-D. BENAMOU, *A domain decomposition method for control problems*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 266–273.
- [287] J.-D. BENAMOU AND Y. BRENIER, *A domain decomposition method for the polar factorization*

- of vector fields*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 231–236.
- [288] J. A. BENEK, P. G. BUNING, AND J. L. STEGER, *A 3-D Chimera grid embedding technique*, AIAA, 85-1523CP (1985).
 - [289] P. BENNER, R. BYERS, H. FASSBENDER, V. MEHRMANN, AND D. WATKINS, *Cholesky-like factorizations of skew-symmetric matrices*, Elect. Trans. Numer. Anal., 11 (2000), pp. 85–93.
 - [290] C. BENNETT AND R. SHARPLEY, *Interpolation of Operators*, Academic Press, New York, 1988.
 - [291] J. P. BENQUE, J. P. GRÉGOIRE, A. HAUGUEL, AND M. MAXANT, *Application des méthodes de décomposition aux calculs numériques en hydraulique industrielle*, in 6e Colloque International sur les méthodes de Calcul Scientifique et Technique, Versailles, 1983.
 - [292] M. W. BENSON AND P. O. FREDERICKSON, *Iterative solution of large sparse linear systems arising in certain multidimensional approximation problems*, Utilitas Mathematica, 22 (1982), pp. 127–140.
 - [293] ———, *Fast pseudo-inverse algorithms on hypercubes*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 23–33.
 - [294] M. BENZI AND M. DELONG, *Approximate Schur complement multilevel methods for general sparse systems*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 52–58.
 - [295] M. BENZI, W. JOUBERT, AND G. MATEESCU, *Numerical experiments with parallel orderings for ILU preconditioners*, Elect. Trans. Numer. Anal., 8 (1998), pp. 88–114.
 - [296] L. BERGAMASCHI, G. PINI, AND F. SARTORETTO, *Approximate inverse preconditioning in the parallel solution of sparse eigenproblems*, Numer. Lin. Alg. Appl., 7 (2000), pp. 99–116.
 - [297] M. J. BERGER, *Data structures for adaptive mesh refinement*, in Adaptive Computational Methods for Partial Differential Equations, I. Babuška, J. Chandra, and J. E. Flaherty, eds., SIAM, Philadelphia, 1984.
 - [298] ———, *Data structures for adaptive grid generation*, SIAM J. Sci. Stat. Comp., 7 (1986), pp. 904–916.
 - [299] ———, *On conservation at grid interfaces*, SIAM J. Numer. Anal., 24 (1987), pp. 967–984.
 - [300] M. J. BERGER AND S. BOKHARI, *A partitioning strategy for nonuniform problems on multiprocessors*, IEEE Trans. Comput., C-36 (1987), pp. 570–580.
 - [301] M. J. BERGER AND P. COLELLA, *Local adaptive mesh refinement for shock hydrodynamics*, J. Comput. Phys., 82 (1989), pp. 64–84.
 - [302] M. J. BERGER AND A. JAMESON, *An adaptive multigrid method for the Euler equation*, in Proceedings of the Ninth International Conference on Numerical Methods in Fluid Dynamics, Soubbaramayer and J. P. Boujot, eds., vol. 218 of Lecture Notes in Physics, Berlin, 1985, Springer-Verlag.
 - [303] ———, *Automatic adaptive grid refinement for the Euler equations*, AIAA J., 23 (1985), pp. 561–568.
 - [304] M. J. BERGER AND J. OLIGER, *An adaptive mesh refinement for hyperbolic partial differential equations*, J. Comput. Phys., 53 (1984), pp. 484–512.
 - [305] T. BERGLIND, *Multi-block Euler method using patched grids*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 285–294.
 - [306] G. BERKOOZ AND E. S. TITI, *Galerkin projections and the proper orthogonal decomposition for equivariant equations*, Phys. Lett. A, 174 (1993), pp. 94–102.
 - [307] C. BERNARDI AND Y. MADAY, *Relèvement polynomial de traces et applications*, M²AN, 24 (1990), pp. 557–611.
 - [308] ———, *Approximations spectrales de problèmes aux limites elliptiques*, vol. Mathématiques & Applications, Springer-Verlag, Paris, 1992.
 - [309] M. BERNDT, T. A. MANTEUFFEL, AND S. F. MCCORMICK, *Local error estimates and adaptive refinement for first-order system least squares (FOSLS)*, Elect. Trans. Numer. Anal., 6 (1997), pp. 35–43.
 - [310] M. BERNDT AND K. WITSCH, *Multigrid with overlapping patches*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 31–40.
 - [311] K. BERNERT, M. JUNG, AND U. RÜDE, *Multigrid tau-extrapolation for nonlinear partial differential equations*, in ICOSAHOM'95, Proceedings of the Third International Con-

- ference on Spectral and High Order Methods, A. V. Ilin and L. R. Scott, eds., Department of Mathematics, University of Houston, 1996, Houston Journal of Mathematics, pp. 543–557.
- [312] P. A. BERNHARDT AND J. U. BRACKBILL, *Solution of elliptic equations using fast Poisson solvers*, J. Comput. Phys., 53 (1983), pp. 382–394.
 - [313] H. S. BERRYMAN, J. H. SALTZ, AND J. S. SCROGGS, *Execution time support for adaptive scientific algorithms on distributed memory machines*, Concurrency, Pract. Exp., 21 (1991), pp. 137–144.
 - [314] A. BEUNSOUSSAN, J.-L. LIONS, AND R. TEMAM, *Sur les méthodes de décomposition, de décentralisation, de coordination et applications*, in Méthodes numériques en sciences physiques et économiques, J.-L. Lions and G. I. Marchuk, eds., Paris, 1974.
 - [315] J. BEY, *Analyse und Simulation eines Konjugierte-Gradienten -Verfahrens mit einem Multilevel-Präkonditionierer zur Lösung dreidimensionaler, elliptischer Randwertprobleme für massiv parallele Rechner*, PhD thesis, RWTH, Aachen, 1991.
 - [316] ———, *Tetrahedral grid refinement*, Computing, 55 (1995), pp. 355–378.
 - [317] J. BEY AND A. REUSKEN, *On the convergence of basic iterative methods for convection-diffusion equations*, Numer. Lin. Alg. Appl., 6 (1999), pp. 329–352.
 - [318] R. BHOGESWARA AND J. E. KILLOUGH, *Domain decomposition and multigrid solvers for flow simulation in porous media on distributed memory parallel processors*, J. Sci. Comput., 7 (1992), pp. 127–162.
 - [319] ———, *Parallel linear solvers for reservoir simulation: A generic approach for existing and emerging computer architectures*, in Proceedings of the SPE Symposium on Reservoir Simulation 1993, Richardson, TX, 1993, Soc of Petroleum Engineers of AIME, pp. 71–82.
 - [320] Z. BI, K. WU, C. WU, AND J. LITVA, *A new finite difference time domain algorithm for solving Maxwell's equations*, IEEE Microw. Guid. Wave Lett., (1991), pp. 382–384.
 - [321] B. BIALECKI, X.-C. CAI, M. DRYJA, AND G. FAIRWEATHER, *An additive Schwarz algorithm for piecewise Hermite bicubic orthogonal spline collocation*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 237–244.
 - [322] B. BIALECKI AND D. S. DILLERY, *Fourier analysis of Schwarz alternating methods for piecewise Hermite bicubic orthogonal spline collocation*, BIT, 33 (1993), pp. 634–646.
 - [323] B. BIALECKI AND M. DRYJA, *Preconditioned conjugate gradient multilevel methods for orthogonal spline collocation discretization of the Dirichlet problem for Poisson's equation*, in AMLI'96: Proceedings of the Conference on Algebraic Multilevel Iteration Methods with Applications, vol. 1, Nijmegen, The Netherlands, 1996, University of Nijmegen, pp. 77–89.
 - [324] G. BIRKHOFF AND A. SCHOENSTADT, *Elliptic Problem Solvers II*, Academic Press, New York, 1984.
 - [325] M. L. BITTENCOURT, C. C. DOUGLAS, AND R. A. FEIJÓO, *Non-nested multigrid methods for linear problems*, Numer. Meth. PDE, 17 (2001), pp. 313–331.
 - [326] ———, *Adaptive non-nested multigrid methods*, Eng. Comput., 19 (2002), pp. 158–176.
 - [327] P. E. BJØRSTAD, *Numerical Solution of the Biharmonic Equation*, PhD thesis, Stanford University, Stanford, CA, 1980.
 - [328] ———, *The direct solution of a generalised biharmonic equation on a disk*, in Efficient Solution of Elliptic Systems, W. Hackbusch, ed., vol. 10 of Notes on Numerical Fluid Mechanics, Braunschweig, 1984, Vieweg, pp. 1–10.
 - [329] ———, *SESAM'80: A modular finite element system for analysis of structures*, in PDE Software: Modules, Interfaces and Systems, B. Enquist and T. Smetsaas, eds., North-Holland, Amsterdam, 1984, pp. 19–27.
 - [330] ———, *A large scale, sparse, secondary storage, direct linear equation solver for structural analysis and its implementation on vector and parallel architectures*, Parallel Comput., (1987).
 - [331] ———, *Multiplicative and additive Schwarz methods: convergence in the two-domain case*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 147–159.
 - [332] P. E. BJØRSTAD, J. BRAEKHUS, AND J. COOK, *Dynamic scheduling of substructure computations in an industrial production environment*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 850–856.
 - [333] P. E. BJØRSTAD, J. BRAEKHUS, AND A. HVIDSTEN, *Parallel substructuring algorithms in structural analysis, direct and iterative methods*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A.

- Kuznetsov, G. A. Meurant, J. P\'eriaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 321–340.
- [334] P. E. BJØRSTAD, W. M. COUGHRAN, AND E. GROSS, *Parallel domain decomposition applied to coupled transport equations*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 369–380.
- [335] P. E. BJØRSTAD, M. DRYJA, AND E. VAINIKKO, *Additive Schwarz methods with no subdomain overlap and with new coarse spaces*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 141–157.
- [336] P. E. BJØRSTAD, M. DRYJA, AND E. VAINIKKO, *Robust additive Schwarz methods on unstructured grids*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 597–606.
- [337] P. E. BJØRSTAD AND A. HVIDSTEN, *Iterative methods for substructured elasticity problems in structural analysis*, in First International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. P\'eriaux, eds., Philadelphia, 1988, SIAM, pp. 301–312.
- [338] P. E. BJØRSTAD AND J. MANDEL, *Spectra of sums of orthogonal projections and applications to parallel computing*, BIT, 31 (1991), pp. 76–88.
- [339] P. E. BJØRSTAD, R. MOE, AND M. D. SKOGEN, *Parallel domain decomposition and iterative refinement algorithms*, in Parallel Algorithms for Partial Differential Equations, W. Hackbusch, ed., Braunschweig, 1991, Vieweg.
- [340] P. E. BJØRSTAD AND M. D. SKOGEN, *Domain decomposition algorithms of Schwarz type, designed for massively parallel computers*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 362–375.
- [341] P. E. BJØRSTAD AND O. B. WIDLUND, *Solving elliptic problems on regions partitioned into substructures*, in Elliptic Problem Solvers II, G. Birkhoff and A. Schoenstadt, eds., Academic Press, New York, 1984, pp. 245–256.
- [342] ———, *Iterative methods for the solution of elliptic problems on regions partitioned into substructures*, SIAM J. Numer. Anal., 23 (1986), pp. 1097–1120.
- [343] ———, *To overlap or not to overlap: A note on a domain decomposition method for elliptic problems*, SIAM J. Sci. Stat. Comput., 10 (1989), pp. 1053–1061.
- [344] K. BLACK, *Penalty method utilized for parabolic problems*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 204–213.
- [345] ———, *Spectral elements on infinite domains*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 274–282.
- [346] M. BLOSS AND R. H. W. HOPPE, *Numerical computation of the value function of optimally controlled stochastic switching processes by multi-grid techniques*, Numer. Funct. Anal. Optimiz., 10 (1989), pp. 275–304.
- [347] H. BLUM, *Asymptotic Error Expansion and Defect Correction in the Finite Element Method*, PhD thesis, Universit\"at Heidelberg, Heidelberg, 1991.
- [348] H. BLUM, Q. LIN, AND R. RANNACHER, *Asymptotic error expansions and Richardson extrapolation for linear finite elements*, Numer. Math., 49 (1986), pp. 11–37.
- [349] H. BLUM AND R. RANNACHER, *On the boundary value problem of the biharmonic operator on domains with angular corners*, Math. Meth. Appl. Sci., 2 (1980), pp. 556–581.
- [350] ———, *Extrapolation techniques for reducing the pollution effect of reentrant corners in the finite element method*, Numer. Math., 52 (1988), pp. 539–564.
- [351] Y. M. BO AND W. X. ZHANG, *Method of multilevel moments with multiplicative correction for EM problems*, in AP-S International Symposium (Digest) (IEEE Antennas and Propagation Society), vol. 2, Piscataway, NJ, 1993, IEEE, pp. 888–891.
- [352] P. BOCHEV, *Experiences with negative norm least-square methods for the Navier–Stokes equations*, Elect. Trans. Numer. Anal., 6 (1997), pp. 44–62.
- [353] P. BOCHEV, Z. CAI, T. A. MANTEUFFEL, AND S. F. MCCORMICK, *First-order system least squares for the Navier–Stokes equations*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 41–55.
- [354] A. BODE, *Ein Mehrgitter/Gleitkomma-Zusatz f\"ur den Knotenprozessor eines Multiprozes-*

- sors*, in Rechnerarchitekturen für die numerische Simulation auf der Basis superschneller Lösungsverfahren I, U. Trottenberg and P. Wypior, eds., GMD-Studien Nr. 88, St. Augustin, 1984, Gesellschaft für Mathematik und Datenverarbeitung, pp. 153–160.
- [355] J. W. BOERSTOEL, *A fast-solver algorithm for steady transonic potential-flow computations with Newton iteration and multigrid relaxation*, in GAMM-Conference on Numerical Methods in Fluid Mechanics, H. Viviand, ed., Braunschweig, 1982, Vieweg, pp. 21–41.
 - [356] ———, *A multigrid algorithm for steady transonic potential flows around aerofoils using Newton iteration*, J. Comput. Phys., 48 (1982), pp. 314–343.
 - [357] ———, *A multigrid algorithm for steady transonic potential flows around aerofoils using Newton iteration*, in Multigrid Methods, H. Lomax, ed., NASA Conference Publication 2202, Ames Research Center, Moffett Field, CA, 1982, pp. 151–172.
 - [358] ———, *Numerical modelling and fast-solver calculation of approximately normal shocks*, in Computational and Asymptotic Methods for Boundary and Interior Layers, J. J. H. Miller, ed., vol. 4 of Boole Press Conference Series, Dublin, 1982, Boole Press, pp. 151–159.
 - [359] J. W. BOERSTOEL AND A. KASSIES, *Integrating multigrid relaxation into a robust fast solver for transonic potential flows around lifting airfoils*, AIAA, 83–1885 (1983).
 - [360] J. W. BOERSTOEL, A. E. P. VELDMAN, J. VOOREN, AND A. J. WEES, *Trends in CFD for aeronautical 3-D steady applications: the Dutch situation*, in Research in Numerical Fluid Mechanics, P. Wesseling, ed., vol. 17 of Notes on Numerical Fluid Mechanics, Braunschweig, 1987, Vieweg, pp. 1–18.
 - [361] I. P. BOGLAEV AND V. V. SIROTKIN, *Computational method for a singular perturbation problem via domain decomposition and its parallel implementation*, Appl. Math. Comput., 56 (1993), pp. 71–95.
 - [362] I. P. BOGLAEV, V. V. SIROTKIN, AND J. D. LAVERS, *The computation of transient 2-D eddy current problem by domain decomposition algorithms*, Math. Comput. Model., 21 (1995), pp. 39–51.
 - [363] G. BOHME, L. RUBART, AND M. STENGER, *Vortex breakdown in shear thinning liquids: experiment and numerical simulation*, J. Non Newton. Fluid Mech., 45 (1992), pp. 1–20.
 - [364] K. BÖHMER, W. GROSS, B. SCHMITT, AND R. SCHWARZ, *Defect corrections and Hartree-Fock method*, in Defect Correction Methods: Theory and Applications, K. Böhmer and H. J. Stetter, eds., Computing Suppl. 5, Springer-Verlag, Vienna, 1984, pp. 193–209.
 - [365] K. BÖHMER, P. W. HEMKER, AND H. J. STETTER, *The defect correction approach*, in Defect Correction Methods: Theory and Applications, K. Böhmer and H. J. Stetter, eds., Computing Suppl. 5, Springer-Verlag, Vienna, 1984, pp. 1–32.
 - [366] K. BÖHMER AND H. J. STETTER, *Defect Correction Methods: Theory and Applications*, Computing Suppl. 5, Springer-Verlag, Vienna, 1984.
 - [367] D. H. BOLEY AND T. GOEHRING, *LQ-Schur projection on large sparse matrix equations*, Numer. Lin. Alg. Appl., 7 (2000), pp. 491–503.
 - [368] C. BOLLRATH, *Two multi-level algorithms for the dam problem*, in Advances in Multi-Grid Methods, D. Braess, W. Hackbusch, and U. Trottenberg, eds., vol. 11 of Notes on Numerical Fluid Mechanics, Braunschweig, 1985, Vieweg, pp. 12–23.
 - [369] ———, *Zwei Mehrgitterverfahren zur numerischen Berechnung von stationären Strömungen durch poröse Medien mit freiem Rand*, PhD thesis, Abteilung für Mathematik, Ruhr-Universität Bochum, 1985.
 - [370] J. H. BOLSTAD AND H. B. KELLER, *A multigrid continuation method for elliptic problems with turning points*, SIAM J. Sci. Stat. Comput., 7 (1986), pp. 1081–1104.
 - [371] W. BOMHOF AND H. VORST, *A parallel linear system solver for circuit simulation problems*, Numer. Lin. Alg. Appl., 7 (2000), pp. 649–665.
 - [372] L. BOMHOLT AND P. LEYLAND, *Implementation of unstructured finite element codes on different parallel computers*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North-Holland), Amsterdam, 1995, pp. 429–442.
 - [373] T. BONK, *A new algorithm for multi-dimensional adaptive numerical quadrature*, in Adaptive Methods – Algorithms, Theory and Applications, vol. 46 of Notes on Numerical Fluid Mechanics, Braunschweig, 1994, Vieweg, pp. 54–68.
 - [374] J. BORDNER AND F. SAIED, *MGLab: An interactive multigrid environment*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 57–71.
 - [375] C. BÖRGERS, *Mehrgitterverfahren für eine Mehrstellendiskreisierung der Poissongleichung und für eine zweidimensionale singulär gestörte Aufgabe*, PhD thesis, Institut für Ange-

- wandte Mathematik, Universität Bonn, 1981.
- [376] ———, *The Neumann–Dirichlet domain decomposition method with inexact solvers on the subdomains*, Numer. Math., 55 (1989), pp. 123–136.
- [377] ———, *Domain imbedding methods for the Stokes equations*, Numer. Math., 57 (1990), pp. 435–452.
- [378] C. BÖRGERS AND O. B. WIDLUND, *A domain decomposition Laplace solver for internal combustion modeling*, SIAM J. Sci. Stat. Comput., 10 (1989), pp. 211–226.
- [379] ———, *On finite element domain imbedding methods*, SIAM J. Numer. Anal., 27 (1990), pp. 963–978.
- [380] F. BORNEMANN, B. ERDMANN, AND R. KORNHUBER, *Adaptive multilevel-methods in three space dimensions*, Int. J. Numer. Methods Engng., 36 (1993), pp. 3187–3203.
- [381] F. A. BORNEMANN, *Adaptive solution of one-dimensional scalar conservation laws with convex flux*, in Adaptive Methods – Algorithms, Theory and Applications, vol. 46 of Notes on Numerical Fluid Mechanics, Braunschweig, 1994, Vieweg, pp. 69–83.
- [382] ———, *Interpolation spaces and optimal multilevel preconditioners*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 3–8.
- [383] F. A. BORNEMANN AND P. DEUFLHARD, *The cascadic multigrid method for elliptic problems*, Numer. Math., 75 (1996), pp. 135–152.
- [384] ———, *Cascadic multigrid methods*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, John Wiley & Sons, pp. 205–212.
- [385] F. A. BORNEMANN AND R. KRAUSE, *Classical and cascadic multigrid: a methodological comparison*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 64–71.
- [386] F. A. BORNEMANN AND H. YSERENTANT, *A basic norm equivalence for the theory of multi-level methods*, Numer. Math., 64 (1993), pp. 455–476.
- [387] A. BORZÌ AND A. KOUBEK, *Multi-grid method for the resolution of thermodynamic Bethe ansatz equations*, Comput. Phys. Commun., 75 (1993), pp. 118–126.
- [388] ———, *On a multi-grid algorithm for the TBA equations*, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 143–150.
- [389] A. BORZÌ, K. KUNISCH, AND M. VANMAELE, *A multigrid approach to the optimal control of solid fuel ignition problems*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 59–65.
- [390] A. BORZÌ, K. W. MORTON, E. SÜLI, AND M. VANMAELE, *A full multi-grid method for the solution of the cell vertex finite volume Cauchy-Riemann equations*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 73–86.
- [391] A. BOSSAVIT, *The Scalar Poincaré–Steklov operator and the Vector one: algebraic structures which underlie their duality*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 19–26.
- [392] E. F. F. BOTTA, K. DEKKER, Y. NOTAY, A. PLOEG, C. VUIK, F. W. WUBS, AND P. M. ZEEUW, *How fast the Laplace equation was solved in 1995*, Appl. Numer. Meth., 24 (1997), pp. 439–455.
- [393] E. F. F. BOTTA AND A. PLOEG, *Preconditioning techniques for matrices with arbitrary sparsity patterns*, (1995), pp. 989–998.
- [394] ———, *Renumbering strategies based on multi-level techniques combined with ILU-decompositions*, Zh. Vychisl. Mat. Mat. Fiz., 11 (1997), pp. 1294–1300.
- [395] E. F. F. BOTTA, A. PLOEG, AND F. W. WUBS, *A fast linear-system solver for large unstructured problems on a shared-memory parallel computer*, in AMLI'96: Proceedings of the Conference on Algebraic Multilevel Iteration Methods with Applications, vol. 1, Nijmegen, The Netherlands, 1996, University of Nijmegen, pp. 105–116.
- [396] E. F. F. BOTTA AND F. W. WUBS, *The convergence behaviour of iterative methods on severely stretched grids*, Int. J. Numer. Meth. Engng., 36 (1993), pp. 3333–3350.
- [397] ———, *Matrix renumbering ILU: an effective algebraic multilevel ILU-preconditioner for sparse matrices*, SIAM J. Matrix Anal. Appl., 20 (1999), pp. 1007–1026.
- [398] N. BOUHAMOU, Q. V. DINH, AND J. PÉRIAUX, *Basic linear parallel solvers for large CFD applications using decomposed unstructured meshes*, in Parallel Computational Fluid Dy-

- namics, Elsevier Science Publishers B.V. (North-Holland), Amsterdam, 1995, pp. 381–388.
- [399] J. X. BOUILLARD AND G. F. BERRY, *Performance of a multigrid three dimensional magnetohydrodynamic generator calculation procedure*, Int. J. Heat Mass Transf., 35 (1992), pp. 2219–2232.
- [400] M. BOULBRACHENE, P. CORTEY-DUMONT, AND J. C. MIELLOU, *Mixing finite elements and finite differences in a subdomain method*, in First International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. Périaux, eds., Philadelphia, 1988, SIAM, pp. 198–216.
- [401] C. BOUMAN AND K. SAUER, *Nonlinear multigrid methods of optimization in Bayesian tomographic image reconstruction*, Proc. SPIE - Int. Soc. Opt. Eng., 1766 (1992), pp. 296–306.
- [402] A. BOUNAIM, *A Lagrangian approach to a DDM for an optimal control problem*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 283–289.
- [403] J. F. BOURGAT, R. GLOWINSKI, AND P. LETALLEC, *Formulation variationnelle et algorithme de décomposition de domaines pour les problèmes elliptiques*, C.R. Acad. Sci. Paris, t. 306, Serie I (1988), pp. 569–572.
- [404] J. F. BOURGAT, R. GLOWINSKI, P. LETALLEC, AND M. VIDRASCU, *Variational formulation and algorithm for trace operator in domain decomposition calculations*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 3–16.
- [405] J. F. BOURGAT, P. LETALLEC, B. PERTHAME, AND Y. QIU, *Coupling Boltzmann and Euler equations without overlapping*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 377–398.
- [406] J.-F. BOURGAT, P. LETALLEC, D. TIDIRI, AND Y. QIU, *Numerical coupling of nonconservative or kinetic models with the conservative compressible Navier–Stokes equations*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 420–440.
- [407] F. BOURQUIN, *Synthèse modale d'opérateurs elliptiques du second ordre*, C.R. Acad. Sci. Paris, t. 309, Serie I (1989), pp. 919–922.
- [408] ———, *Synthèse modale et analyse numérique des multistructures élastiques*, PhD thesis, Université Pierre et Marie Curie, Paris, 1991.
- [409] F. BOURQUIN AND F. D' HENNEZEL, *Application of domain decomposition techniques to modal synthesis for eigenvalue problems*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 214–223.
- [410] F. BOURQUIN AND R. NAMAR, *Decoupling and modal synthesis of vibrating continuous systems*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 290–303.
- [411] K. P. BOWMAN AND J. HUANG, *A multigrid solver for the Helmholtz equation on a semiregular grid on the sphere*, Mon. Wea. Rev., 119 (1991), pp. 769–775.
- [412] B. J. BRAAMS, *Magnetohydrodynamic equilibrium calculation using multigrid*, in Multigrid Methods II, W. Hackbusch and U. Trottenberg, eds., Berlin, 1986, Springer-Verlag, pp. 38–51.
- [413] K. BRACKENRIDGE, *Multigrid and cyclic reduction applied to the Helmholtz equation*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 31–41.
- [414] D. BRAESS, *The contraction number of a multigrid method for solving the Poisson equation*, Numer. Math., 37 (1981), pp. 387–404.
- [415] ———, *The convergence rate of a multigrid method with Gauss–Seidel relaxation for the Poisson equation*, in Multigrid Methods, W. Hackbusch and U. Trottenberg, eds., vol. 960 of Lecture Notes in Mathematics, Berlin, 1982, Springer-Verlag, pp. 368–386.
- [416] ———, *The convergence rate of a multigrid method with Gauss–Seidel relaxation for the Poisson equation (revised)*, Math. Comp., 42 (1984), pp. 505–519.
- [417] ———, *On the combination of the multigrid method and conjugate gradients*, in Multigrid Methods II, W. Hackbusch and U. Trottenberg, eds., Berlin, 1986, Springer-Verlag, pp. 52–64.
- [418] ———, *A multigrid method for the membrane problem*, Comput. Mech., 3 (1988), pp. 321–

- [419] ———, *Towards algebraic multigrid for elliptic problems of second order*, Computing, 55 (1995), pp. 379–393.
- [420] ———, *Finite Elements. Theory, Fast Solvers and Applications in Solid Mechanics*, Cambridge University Press, Cambridge, 1997.
- [421] D. BRAESS, M. BIEBIGHÄUSER, P. GRASSBERGER, AND R. LEUVERINK, *Multi-grid methods for steady state diffusion in random media*, J. Comput. Phys., 107 (1993), pp. 118–123.
- [422] D. BRAESS AND C. BLÖMER, *A multigrid method for a parameter dependent problem in solid mechanics*, Numer. Math., 57 (1990), pp. 747–761.
- [423] D. BRAESS AND W. DAHMEN, *A cascadic multigrid algorithm for the Stokes equation*, Numer. Math., 82 (1999), pp. 179–191.
- [424] D. BRAESS, M. DRYJA, AND W. HACKBUSCH, *A multigrid method for nonconforming FE-discretisations with application to nonmatching grids*, Computing, 63 (1999), pp. 1–25.
- [425] D. BRAESS AND W. HACKBUSCH, *A new convergence proof for the multigrid method including the V cycle*, SIAM J. Numer. Anal., 20 (1983), pp. 967–975.
- [426] D. BRAESS, W. HACKBUSCH, AND U. TROTTERBERG, *Advances in Multi-Grid Methods*, vol. 11 of Notes on Numerical Fluid Mechanics, Vieweg, Braunschweig, 1984.
- [427] D. BRAESS AND P. PEISKER, *A conjugate gradient method and a multigrid algorithm for morley's finite element approximation of the biharmonic equation*, Numer. Math., 50 (1987), pp. 567–586.
- [428] D. BRAESS AND R. SARAZIN, *An efficient smoother for the Stokes problem*, Appl. Numer. Math., 23 (1997), pp. 3–20.
- [429] D. BRAESS AND R. VERFÜRTH, *Multi-grid methods for non-conforming finite element methods*, SIAM J. Numer. Anal., 27 (1990), pp. 979–986.
- [430] E. BRAKKEE AND A. SEGAL, *A parallel domain decomposition algorithm for the incompressible Navier Stokes equations*, in Proceedings of Massively Parallel Processing Applications and Development, Delft, The Netherlands, June 21–23, 1994, Amsterdam, 1994, Elsevier, pp. 743–752.
- [431] E. BRAKKEE, A. SEGAL, AND C. G. M. KASSELS, *Parallel domain decomposition algorithm for the incompressible Navier–Stokes equations*, Simul. Pract. Theory, 3 (1995), pp. 185–205.
- [432] E. BRAKKEE, C. VUIK, AND P. WESSELING, *Domain decomposition for the incompressible Navier– Stokes equations: solving subdomain problems accurately and inaccurately*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 443–451.
- [433] A. BRAMBILLA, C. CARLENZOLI, G. GAZZANIGA, P. GERVASIO, AND G. SACCHI, *Implementation of domain decomposition techniques on nCUBE2 parallel machine*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 345–351.
- [434] J. BRAMBLE, J. E. PASCIAK, AND A. VASSILEV, *Non-overlapping domain decomposition preconditioners with inexact solves*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 40–52.
- [435] J. H. BRAMBLE, *A second order finite difference analogue of the first biharmonic boundary value*, Numer. Math., 9 (1966), pp. 236–249.
- [436] ———, *Multigrid Methods*, vol. 294 of Pitman Research Notes in Mathematical Sciences, Longman Scientific & Technical, Essex, England, 1993.
- [437] J. H. BRAMBLE, R. E. EWING, R. R. PARASHKEVOV, AND J. E. PASCIAK, *Domain decomposition methods for problems with uniform local refinement in two dimensions*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 91–100.
- [438] ———, *Domain decomposition methods for problems with partial refinement*, SIAM J. Sci. Stat. Comput., 13 (1992), pp. 397–410.
- [439] J. H. BRAMBLE, R. E. EWING, J. E. PASCIAK, AND A. H. SCHATZ, *A preconditioning technique for the efficient solution of problems with local grid refinement*, Comp. Meth. Appl. Mech. Engng., 67 (1988), pp. 149–159.
- [440] J. H. BRAMBLE, D. Y. KWAK, AND J. E. PASCIAK, *Uniform convergence of multigrid V-cycle iterations for indefinite and nonsymmetric problems*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 43–59.

- [441] ———, *Uniform convergence of multigrid V-cycle iterations for indefinite and nonsymmetric problems*, SIAM J. Numer. Anal., 31 (1994), pp. 1746–1763.
- [442] J. H. BRAMBLE AND J. E. PASCIAK, *New convergence estimates for multigrid algorithms*, Math. Comp., 49 (1987), pp. 311–329.
- [443] ———, *The analysis of smoothers for multigrid algorithms*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 1, Denver, 1991, University of Colorado, pp. 153–175.
- [444] ———, *The analysis of smoothers for multigrid algorithms*, Math. Comp., 58 (1992), pp. 467–488.
- [445] ———, *New estimates for multigrid algorithms including the V-cycle*, Math. Comp., 60 (1993), pp. 447–471.
- [446] ———, *Uniform convergence estimates for multigrid V-cycle algorithms with less than full elliptic regularity*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 17–26.
- [447] J. H. BRAMBLE, J. E. PASCIAK, AND A. H. SCHATZ, *The construction of preconditioners for elliptic problems by substructuring, I*, Math. Comp., 47 (1986), pp. 103–134.
- [448] ———, *An iterative method for elliptic problems on regions partitioned into substructures*, Math. Comp., 46 (1986), pp. 361–369.
- [449] ———, *The construction of preconditioners for elliptic problems by substructuring, II*, Math. Comp., 49 (1987), pp. 1–16.
- [450] ———, *The construction of preconditioners for elliptic problems by substructuring, III*, Math. Comp., 51 (1988), pp. 415–430.
- [451] ———, *The construction of preconditioners for elliptic problems by substructuring, IV*, Math. Comp., 53 (1989), pp. 1–24.
- [452] J. H. BRAMBLE, J. E. PASCIAK, J. WANG, AND J. XU, *Convergence estimates for multigrid algorithms without regularity assumptions*, Math. Comp., 57 (1991), pp. 23–45.
- [453] ———, *Convergence estimates for product iterative methods with applications to domain decomposition*, Math. Comp., 57 (1991), pp. 1–21.
- [454] J. H. BRAMBLE, J. E. PASCIAK, AND J. XU, *The analysis of multigrid algorithms for non-symmetric and indefinite elliptic problems*, Math. Comp., 51 (1988), pp. 389–414.
- [455] ———, *Parallel multilevel preconditioners*, Math. Comp., 55 (1990), pp. 1–22.
- [456] ———, *Parallel multilevel preconditioners*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1990, SIAM, pp. 341–357.
- [457] ———, *The analysis of multigrid algorithms with nonnested spaces or noninherited quadratic forms*, Math. Comp., 56 (1991), pp. 1–34.
- [458] ———, *A multilevel preconditioner for domain decomposition boundary systems*, in Proceedings of the Tenth International Conference on Computer Methods in Applied Science and Engineering, New York, 1992, Nova Sciences.
- [459] J. H. BRAMBLE AND J. XU, *A local post-processing technique for improvising the accuracy in mixed finite element approximations*, SIAM J. Numer. Anal., 24 (1989), pp. 1267–1275.
- [460] ———, *Some estimates for a weighted l^2 projection*, Math. Comp., 56 (1991), pp. 463–476.
- [461] R. B. BRAMLEY, *Row Projection Methods for Linear Systems*, PhD thesis, University of Illinois, May 1989.
- [462] K. BRAND, *Multigrid bibliography*, in Multigrid Methods, W. Hackbusch and U. Trottenberg, eds., vol. 960 of Lecture Notes in Mathematics, Berlin, 1982, Springer-Verlag, pp. 631–650.
- [463] A. BRANDT, *Multi-level adaptive technique (MLAT) for fast numerical solution to boundary value problems*, in Proceedings of the Third International Conference on Numerical Methods in Fluid Mechanics, H. Cabannes and R. Teman, eds., vol. 18 of Lecture Notes in Physics, Berlin, 1973, Springer-Verlag, pp. 82–89.
- [464] ———, *Multi-level adaptive solutions to boundary-value problems*, Math. Comp., 31 (1977), pp. 333–390.
- [465] ———, *Multi-level adaptive techniques (MLAT) for partial differential equations: ideas and software*, in Mathematical Software III, J. R. Rice, ed., Academic Press, New York, 1977, pp. 277–318.
- [466] ———, *Multi-level adaptive finite-element methods. I. Variational problems*, in Special Topics of Applied Mathematics, J. Frehse, D. Pallaschke, and U. Trottenberg, eds., North-Holland, Amsterdam, 1979, pp. 91–128.
- [467] ———, *Multi-level adaptive techniques (MLAT) for singular-perturbation problems*, in Nu-

- merical Analysis of Singular Perturbation Problems, P. W. Hemker and J. J. H. Miller, eds., Academic Press, New York, 1979, pp. 53–142.
- [468] ———, *Multi-level adaptive computations in fluid dynamics*, AIAA J., 18 (1980), pp. 1165–1172.
- [469] ———, *Numerical stability and fast solutions to boundary value problems*, in Boundary and Interior Layers—Computational and Asymptotic Methods, J. J. H. Miller, ed., Boole Press, Dublin, 1980, pp. 29–49.
- [470] ———, *Stages in developing multigrid solutions*, in Numerical Methods for Engineering I, E. Absi, R. Glowinski, P. Lascaux, and H. Veysseire, eds., Dunod, Paris, 1980, pp. 23–45.
- [471] ———, *Multigrid solvers on parallel computers*, in Elliptic Problem Solvers, M. H. Schultz, ed., Academic Press, New York, 1981, pp. 39–83.
- [472] ———, *Guide to multigrid development*, in Multigrid Methods, W. Hackbusch and U. Trottenberg, eds., vol. 960 of Lecture Notes in Mathematics, Springer-Verlag, Berlin, 1982, pp. 220–312.
- [473] ———, *Introductory remarks on multigrid methods*, in Numerical Methods in Fluid Dynamics, K. W. Morton and M. J. Baines, eds., 1982.
- [474] ———, *Multigrid solutions to steady-state compressible Navier–Stokes equations. I.*, in Computing Methods in Applied Sciences and Engineering V, R. Glowinski and J.-L. Lions, eds., 1982, pp. 407–423.
- [475] ———, *Stages in developing multigrid solutions*, in Numerical Methods for Engineers (Proc. 2nd Int. Congr.), E. Absi, R. Glowinski, P. Lascaux, and H. Veysseire, eds., Dunod, Paris, 1982, pp. 23–43.
- [476] ———, *Local and multi-level parallel processing mill*, in Rechnerarchitekturen für die numerische Simulation auf der Basis superschneller Lösungsverfahren I, U. Trottenberg and P. Wypior, eds., GMD-Studien Nr. 88, St. Augustin, 1984, Gesellschaft für Mathematik und Datenverarbeitung, pp. 31–40.
- [477] ———, *Multigrid techniques: 1984 guide with applications to fluid dynamics*, GMD-Studien Nr. 85, Gesellschaft für Mathematik und Datenverarbeitung, St. Augustin, 1984.
- [478] ———, *Introduction—levels and scales*, in Multigrid Methods for Integral and Differential Equations, D. J. Paddon and H. Holstein, eds., 3, Oxford, 1985, Clarendon Press, pp. 1–10.
- [479] ———, *Algebraic multigrid theory: The symmetric case*, Appl. Math. Comput., 19 (1986), pp. 23–56.
- [480] ———, *Multilevel computations: Review and recent developments*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 35–62.
- [481] ———, *Multi-level algorithms for partial differential equations and large grid problems*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 1, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 21–54.
- [482] ———, *Rigorous local mode analysis of multigrid*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 1, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 55–133.
- [483] ———, *The Weizmann Institute research in multilevel computation: 1988 report*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 13–53.
- [484] ———, *Multi-level adaptive finite-element methods I: Variational problems*, in Special Topics of Applied Mathematics, North-Holland, Amsterdam, 1991, pp. 91–128.
- [485] ———, *Multilevel computations of integral transforms and particle interaction with oscillatory kernels*, Comput. Phys. Commun., 65 (1991), pp. 24–38.
- [486] ———, *Multigrid methods in lattice field computations*, Nucl. Phys. B, Proc. Suppl., 26B (1992), pp. 137–180.
- [487] ———, *Rigorous quantitative analysis of multigrid, I: Constant coefficients two-level cycle with L_2 -norm*, SIAM J. Numer. Anal., 31 (1994), pp. 1695–1730.
- [488] ———, *The Gauss Center research in multiscale scientific computation*, Elect. Trans. Numer. Anal., 6 (1997), pp. 1–34.
- [489] ———, *General highly accurate algebraic coarsening*, Elect. Trans. Numer. Anal., 10 (2000), pp. 1–20.
- [490] A. BRANDT AND C. W. CRYER, *Multigrid algorithms for the solution of linear complemen-*

tarity problems arising from free boundary problems, SIAM J. Sci. Stat. Comput., 4 (1983), pp. 655–684.

- [491] A. BRANDT, J. E. DENDY, AND H. M. RUPPEL, *The multigrid method for semi-implicit hydrodynamics codes*, J. Comput. Phys., 34 (1980), pp. 348–370.
- [492] A. BRANDT AND N. DINAR, *Multigrid solutions to elliptic flow problems*, in Numerical Methods for Partial Differential Equations, S. Parter, ed., Academic Press, New York, 1979, pp. 53–147.
- [493] A. BRANDT AND B. DISKIN, *Multigrid solvers on decomposed domains*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 135–155.
- [494] A. BRANDT AND J. DYM, *Effective boundary treatment for the biharmonic Dirichlet problem*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 97–107.
- [495] A. BRANDT, S. R. FULTON, AND G. D. TAYLOR, *Improved spectral multigrid methods for periodic elliptic problems*, J. Comput. Phys., 58 (1985), pp. 96–112.
- [496] A. BRANDT, M. GALUN, AND D. RON, *Optimal multigrid algorithms for calculating thermodynamic limits*, J. Stat. Phys., 74 (1994), pp. 313–348.
- [497] A. BRANDT AND J. GREENWALD, *Parabolic Multigrid Revisited*, International Series of Numerical Mathematics, Birkhäuser, Basel, 1991.
- [498] A. BRANDT, W. JOPPICH, J. LINDEN, G. LONSDALE, AND A. SCHULLER, *Multigrid Course*, GMD-690, Gesellschaft für Mathematik und Datenverarbeitung, St. Augustin, 1992.
- [499] A. BRANDT AND A. LANZA, *Multigrid in general relativity I: Schwarzschild space time*, Class. Quantum Gravity, 5 (1988), pp. 713–732.
- [500] A. BRANDT AND I. LIVSHITS, *Wave-Ray multigrid method for standing wave equations*, Elect. Trans. Numer. Anal., 6 (1997), pp. 162–181.
- [501] A. BRANDT AND A. A. LUBRECHT, *Multilevel matrix multiplication and fast solution of integral equations*, J. Comp. Phys., 90 (1990), pp. 348–370.
- [502] A. BRANDT, S. F. MCCORMICK, AND J. W. RUGE, *Multigrid methods for differential eigenproblems*, SIAM J. Sci. Stat. Comput., 4 (1983), pp. 244–260.
- [503] ———, *Algebraic multigrid (AMG) for sparse matrix equations*, in Sparsity and Its Applications, D. J. Evans, ed., Cambridge University Press, Cambridge, 1984.
- [504] A. BRANDT, S. F. MCCORMICK, AND G. WADE, *Multilevel parameter estimation*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 2, Denver, 1991, University of Colorado, pp. 283–296.
- [505] A. BRANDT AND V. MIKULINSKY, *On recombining iterants in multigrid algorithms and problems with small islands*, SIAM J. Sci. Comput., 16 (1995), pp. 20–28.
- [506] A. BRANDT AND D. OPHIR, *Gridpack: Toward unification of general grid programming*, in IFIP Conference on PDE software, B. Enquist and T. Smetsaas, eds., Amsterdam, 1983, North-Holland.
- [507] A. BRANDT AND S. TA'ASAN, *Multigrid solutions to quasi-elliptic schemes*, in Progress and Supercomputing in Computational Fluid Dynamics, E. M. Murmann and S. S. Abarbanel, eds., Birkhäuser Verlag, Boston, 1985, pp. 235–255.
- [508] ———, *Multigrid methods for nearly singular and slightly indefinite problems*, in Multigrid Methods II, W. Hackbusch and U. Trottenberg, eds., Berlin, 1986, Springer-Verlag, pp. 99–121.
- [509] A. BRANDT AND C. H. VENNER, *Multilevel evaluation of integral transforms on adaptive grids*, in Multigrid Methods V, vol. 3 of Lecture Notes in Computational Science and Engineering, Berlin, 1998, Springer, pp. 21–44.
- [510] A. BRANDT AND I. YAVNEH, *Improved coarse-grid correction for high-Reynolds flows*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 1, Denver, 1991, University of Colorado, pp. 127–149.
- [511] ———, *Inadequacy of first-order upwind difference schemes for some recirculating flows*, J. Comput. Phys., 93 (1991), pp. 128–143.
- [512] ———, *On multigrid solution of high-Reynolds incompressible entering flows*, J. Comput. Phys., 101 (1992), pp. 151–164.
- [513] ———, *Accelerating multigrid convergence and high-Reynolds recirculating flows*, SIAM J. Sci. Comput., 14 (1993), pp. 607–626.
- [514] A. BRANDT AND L. Y. ZASLAVSKY, *Multilevel algorithm for atmospheric assimilation*, in

- Seventh Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 87–96.
- [515] M. BREDIF, *Une méthode d'éléments finis multigrille pour le calcul d'écoulements potentiels transsoniques*, in Proceedings of the Third International Symposium on Numerical Methods in Engineering, P. Lascaux, ed., vol. 1, Paris, 1983, Pluralis, pp. 247–254.
 - [516] S. C. BRENNER, *Multigrid Methods for Nonconforming Finite Elements*, PhD thesis, University of Michigan, Ann Arbor, MI, 1988.
 - [517] ———, *Multigrid methods for nonconforming finite elements*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 54–65.
 - [518] ———, *Multigrid methods for nonconforming finite elements*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 1, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 135–149.
 - [519] ———, *An optimal order multigrid for P1 nonconforming finite elements*, Math. Comp., 52 (1989), pp. 1–15.
 - [520] ———, *An optimal order nonconforming multigrid method for the biharmonic equation*, SIAM J. Numer. Anal., 26 (1989), pp. 1124–1138.
 - [521] ———, *A nonconforming multigrid method for the stationary Stokes equations*, Math. Comp., 55 (1990), pp. 411–437.
 - [522] ———, *Multigrid algorithm for the lowest-order Raviart-Thomas mixed triangular finite element method*, SIAM J. Numer. Anal., 29 (1992), pp. 647–678.
 - [523] ———, *A nonconforming mixed multigrid method for the pure displacement problem in planar linear elasticity*, SIAM J. Numer. Anal., 30 (1993), pp. 116–135.
 - [524] ———, *A nonconforming mixed multigrid method for the pure traction problem in planar linear elasticity*, Math. Comp., 63 (1994), pp. 435–460 and S1–S5.
 - [525] ———, *Two-level additive Schwarz preconditioners for nonconforming finite elements*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 9–14.
 - [526] ———, *A two-level additive schwarz preconditioner for the stationary Stokes equations*, Adv. Comput. Math., 4 (1995), pp. 111–126.
 - [527] ———, *Multigrid methods for parameter dependent problems*, Modél. Math. Anal. Numér., 30 (1996), pp. 265–297.
 - [528] ———, *Preconditioning complicated finite elements by simple finite elements*, SIAM J. Sci. Comput., 17 (1996), pp. 1269–1274.
 - [529] ———, *A two-level additive Schwarz preconditioner for nonconforming plate elements*, Numer. Math., 72 (1996), pp. 419–447.
 - [530] ———, *Two-level additive Schwarz preconditioners for nonconforming finite element methods*, Math. Comp., 65 (1996), pp. 897–921.
 - [531] ———, *Two-level additive Schwarz preconditioners for plate elements*, Wuhan U. J. Nat. Sci., 1 (1996), pp. 658–667.
 - [532] S. C. BRENNER AND L. R. SCOTT, *The Mathematical Theory of Finite Element Methods*, Texts in Applied Mathematics, Springer-Verlag, New York, 1994.
 - [533] S. C. BRENNER AND L. Y. SUNG, *Linear finite element methods for planar linear elasticity*, Math. Comp., 59 (1992), pp. 321–338.
 - [534] ———, *Multigrid methods for the computation of singular solutions and stress intensity factors II. Crack singularities*, BIT, 37 (1997), pp. 623–643.
 - [535] M. BREUER AND D. HANEL, *A dual time stepping method for 3-D, viscous, incompressible vortex flows*, Comput. Fluids, 22 (1993), pp. 467–484.
 - [536] C. BREZINSKI AND M. REDIVO ZAGLIA, *Look-ahead in Bi-CGSTAB and other product-type methods for linear systems*, BIT, 35 (1995), pp. 169–201.
 - [537] F. BREZZI, *On the existence, uniqueness and approximation of saddle point problems arising from Lagrangian multipliers*, RAIRO Anal. Numer., 2 (1974), pp. 129–151.
 - [538] F. BREZZI, C. C. DOUGLAS, AND L. D. MARINI, *A parallel domain reduction method*, Numer. Meth. for PDE, 5 (1989), pp. 195–202.
 - [539] F. BREZZI, L. P. FRANCA, D. MARINI, AND A. RUSSO, *Stabilization techniques for domain decomposition methods with non-matching grids*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 1–11.

- [540] F. BREZZI AND J. PITÁRANTA, *On the stabilization of finite element approximations of the Stokes equations*, in Efficient Solution of Elliptic Systems, W. Hackbusch, ed., vol. 10 of Notes on Numerical Fluid Mechanics, Braunschweig, 1984, Vieweg, pp. 11–19.
- [541] F. BREZZI AND L. D. MARINI, *A three-fold domain decomposition method*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 27–34.
- [542] F. BREZZI, L. D. MARINI, AND P. PIETRA, *Numerical simulation of semiconductor devices*, Comp. Meth. Appl. Mech. Engng., 75 (1989), pp. 493–513.
- [543] L. BRIEGER AND G. LECCA, *Parallel multigrid preconditioning for finite element models of groundwater flow*, in International Conference on Computational Methods in Water Resources, vol. 1, Southampton, 1996, Computational Mechanics Publishing, pp. 505–513.
- [544] W. L. BRIGGS, *A Multigrid Tutorial*, SIAM Books, Philadelphia, 1987. First edition.
- [545] W. L. BRIGGS, L. HART, S. F. MCCORMICK, AND D. QUINLAN, *Multigrid methods on a hypercube*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 63–83.
- [546] W. L. BRIGGS AND V. E. HENSON, *Fft as a multigrid algorithm*, SIAM Review, 32 (1990), pp. 252–261.
- [547] ———, *Wavelets and multigrid*, SIAM J. Sci. Comput., 14 (1993), pp. 506–510.
- [548] W. L. BRIGGS, V. E. HENSON, AND S. F. MCCORMICK, *A Multigrid Tutorial*, SIAM Books, Philadelphia, 2000. Second edition.
- [549] M. O. BRISTEAU, E. J. DEAN, R. GLOWINSKI, V. KWAK, AND J. PÉRIAUX, *Exact controllability and domain decomposition methods with non-matching grids for the computation of scattering waves*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 291–308.
- [550] M. O. BRISTEAU, V. GIRAULT, R. GLOWINSKI, T. W. PAN, J. PÉRIAUX, AND Y. XIANG, *On a fictitious domain method for flow and wave problems*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 361–386.
- [551] M. O. BRISTEAU, R. GLOWINSKI, AND J. PÉRIAUX, *Numerical methods for the Navier–Stokes equations*, Computer Physics Reports, 6 (1987), pp. 73–187.
- [552] ———, *Acceleration procedures for the numerical simulation of compressible and incompressible viscous flows*, in Advances in Computational Nonlinear Mechanics, J. S. Dolsinis, ed., Springer–Verlag, Vienna, 1989, pp. 197–243.
- [553] ———, *On the numerical solution of the Helmholtz equations at large wave numbers using exact controllability methods. Application to scattering*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 399–419.
- [554] M. O. BRISTEAU, R. GLOWINSKI, J. PÉRIAUX, P. PERRIER, O. PIRONNEAU, AND G. POIRIER, *On the numerical solution of nonlinear problems in fluid dynamics by least squares and finite element methods (II)*, Comp. Meth. Appl. Mech. Engng., 51 (1985), pp. 363–394.
- [555] L. BROCHARD, *Domain decomposition and relaxation methods*, in Parallel Algorithms and Architectures, M. Cosnard, ed., Elsevier, Amsterdam, 1986, pp. 61–72.
- [556] ———, *Efficiency of multicolor domain decomposition on distributed memory systems*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 249–259.
- [557] J. BROEZE, B. GEURTS, H. KUERTEN, AND M. STRENG, *Multigrid acceleration of time-accurate DNS of compressible turbulent flow*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 109–121.
- [558] F. E. BROWDER, *On some approximation methods for solutions of the Dirichlet problem for linear elliptic equations of arbitrary order*, J. Math. Mech., 7 (1958), pp. 69–80.
- [559] R. C. BROWER, K. MORIARTY, E. MYERS, AND C. REBBI, *The multigrid method for fermion calculations in quantum chromodynamics*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 85–100.
- [560] R. C. BROWER, K. MORIARTY, C. REBBI, AND E. VICARI, *Variational multigrid for non*

- abelian gauge theory*, Nucl. Phys., Proc. Suppl., 20 (1991), pp. 89–93.
- [561] R. C. BROWER, P. TAMAYO, AND B. YORK, *A parallel multigrid algorithm for percolation clusters*, J. Stat. Phys., 63 (1991), pp. 73–88.
- [562] D. BROWN, J. H. R. CLARKE, M. OKUDA, AND T. YAMAZAKI, *A domain decomposition parallelization strategy for molecular dynamics simulations on distributed memory machines*, Comput. Phys. Commun., 74 (1993), pp. 67–80.
- [563] ———, *A domain decomposition parallel processing algorithm for molecular dynamics simulations of polymers*, Comput. Phys. Commun., 83 (1994), pp. 1–13.
- [564] D. L. BROWN, R. C. Y. CHIN, G. W. HEDSTROM, AND T. A. MANTEUFFEL, *Layer tracking, asymptotics, and domain decomposition*, in Proceedings of the ICASE Workshop on Heterogeneous Domain Decomposition, NASA Langley Research Center, 1991, ICASE.
- [565] D. L. BROWN, L. G. M. REYNA, AND L. GUILLERMO, *A two-dimensional mesh refinement method for problems with one-dimensional singularities*, SIAM J. Sci. Stat. Comp., 6 (1985), pp. 515–531.
- [566] J. J. BROWN, *A multigrid mesh-embedding technique for three-dimensional transonic potential flow analysis*, in Multigrid Methods, H. Lomax, ed., NASA Conference Publication 2202, Ames Research Center, Moffett Field, CA, 1982, pp. 131–150.
- [567] ———, *A multigrid mesh-embedding technique for three-dimensional transonic potential flow analysis*, in Multigrid Methods, H. Lomax, ed., NASA Conference Publication 2202, Ames Research Center, Moffett Field, CA, 1982, pp. 131–149.
- [568] J. L. BROWN, *An embedded-mesh potential flow analysis*, AIAA J., 22 (1984), pp. 174–178.
- [569] P. BROWN AND Y. SAAD, *Hybrid Krylov methods for nonlinear systems of equations*, SIAM J. Sci. Stat. Comput., 11 (1990), pp. 450–481.
- [570] R. BRU, V. MIGALLON, J. PENADES, AND D. B. SZYLD, *Parallel, synchronous and asynchronous two-stage multisplitting methods*, Electr. Trans. Numer. Anal., 3 (1995), pp. 24–38.
- [571] A. M. BRUASET, H. P. LANGTANGEN, AND G. W. ZUMBUSCH, *Domain decomposition and multilevel methods in Diffpack*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 655–662.
- [572] A. M. BRUASET AND A. TVEITO, *A numerical study of optimized sparse preconditioners*, BIT, 34 (1994), pp. 177–204.
- [573] M. BRUCOLI, A. D. ROMA, M. L. SCALA, AND M. TROVATO, *Parallel in time method based on shifted Picard iterations for power system transient stability analysis*, Eur. Trans. Electr. Power Eng., 4 (1994), pp. 525–532.
- [574] U. BUCKLE AND M. PERIĆ, *Numerical simulation of a buoyant and thermo capillary convection in a square cavity*, Numer. Heat Transf. Appl., 21 (1992), pp. 121–141.
- [575] H.-J. BUNGARTZ, *An adaptive Poisson solver using hierarchical bases and sparse grids*, in Proceedings of the IMACS International Symposium on Iterative Methods in Linear Algebra, Brussels, April, 1991, Amsterdam, 1992, Elsevier.
- [576] ———, *Dünne Gitter und deren Anwendung bei der adaptiven Lösung der dreidimensionalen Poisson-Gleichung*, PhD thesis, Institut für Informatik, TU München, 1992.
- [577] H.-J. BUNGARTZ, *A multigrid algorithm for higher order finite elements on sparse grids*, Electr. Trans. Numer. Anal., 6 (1997), pp. 63–77.
- [578] H.-J. BUNGARTZ AND T. DORNSEIFER, *Sparse grids: recent developments for elliptic partial differential equations*, in Multigrid Methods V, vol. 3 of Lecture Notes in Computational Science and Engineering, Berlin, 1998, Springer, pp. 45–70.
- [579] H.-J. BUNGARTZ, M. GRIEBEL, D. RÖSCHKE, AND C. ZENGER, *A proof of convergence for the combination technique for the Laplace equation using tools of symbolic computation*, in IMACS Symposium on Symbolic Computation, Lille, June 1993, IMACS/Université des Sciences et Technologies de Lille, Villeneuve d'Ascq, 1993, IMACS.
- [580] ———, *Pointwise convergence of the combination technique for Laplace's equation*, E. W. J. Numer. Math., 1 (1994), pp. 21–45.
- [581] ———, *Two proofs of convergence for the combination technique for the efficient solution of sparse grid problems*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 15–20.
- [582] ———, *A proof of convergence for the combination technique for the Laplace equation using tools of symbolic computation*, Math. Comput. Simul., 42 (1996), pp. 595–605.
- [583] H.-J. BUNGARTZ, M. GRIEBEL, AND U. RÜDE, *Extrapolation, combination and sparse grid techniques for elliptic boundary value problems*, in International Conference on Spectral and High Order Methods, ICOSAHOM 92, Amsterdam, 1992, Elsevier.

- [584] ———, *Extrapolation, combination and sparse grid techniques for elliptic boundary value problems*, Comput. Meth. Appl. Mech. Eng., 116 (1994), pp. 243–252.
- [585] H.-J. BUNGARTZ, M. GRIEBEL, AND C. ZENGER, *Einführung in die Computergraphik: Grundlagen, Geometrische Modellierung Algorithmen*, Vieweg-Verlag, Braunschweig, 1996.
- [586] J. BURMEISTER, *Paralleles Lösen diskreter parabolischer Probleme mit Mehrgittertechniken*, PhD thesis, Universitat Kiel, Kiel, 1985.
- [587] K. BURRAGE, Z. JACKIEWICZ, S. P. NORSETT, AND R. A. RENAUT, *Preconditioning waveform relaxation iterations for differential systems*, BIT, 36 (1996), pp. 54–76.
- [588] A. B. BURSHTEJN, *A semi-lagrangian scheme utilizing the multigrid method*, Meteorologiya i Gidrologiya, 5 (1994), pp. 21–31.
- [589] R. BUSCHMANN, *Joint multigrid estimation of 2D motion and object boundaries using boundary patterns*, Proc. SPIE - Int. Soc. Opt. Eng., 2094 (1993), pp. 106–118.
- [590] B. L. BUZBEE, *A fast Poisson solver amenable to parallel computation*, IEEE Trans. Comput., C-22 (1973), pp. 793–796.
- [591] C. BYUN AND G. P. GURUSWAMY, *Wing-body aeroelasticity using finite-difference fluid/finite-element structural equations on parallel computers*, in Collection of Technical Papers - Proceedings of the AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, vol. 3, New York, NY, 1994, AIAA, pp. 1356–1365.
- [592] J. CAHOUET, *On some difficulties occurring in the simulation of incompressible fluid flows by domain decomposition methods*, in First International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. P閞iaux, eds., Philadelphia, 1988, SIAM, pp. 313–332.
- [593] J. CAHOUET AND J. P. CHABARD, *Multi-domains and multi-solvers finite element approach for the Stokes problem*, in Innovative Numerical Methods in Engineering, R. P. Shaw, J. P閏iaux, A. Chaudoet, J. Wu, C. Marino, and C. A. Brebbia, eds., Springer-Verlag, Berlin, 1986, pp. 317–322.
- [594] W. CAI, *Domain decomposition and computation of two dimensional detonation waves*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 459–464.
- [595] W. CAI, Z.-C. SHI, C.-W. SHU, AND J. XU, *Numerical Methods in Applied Sciences*, Science Press New York, Ltd., New York, 1996.
- [596] X.-C. CAI, *An optimal two-level overlapping domain decomposition method for elliptic problems in two and three dimensions*, SIAM J. Sci. Stat. Comput., 14 (1989), pp. 239–247.
- [597] ———, *Some Domain Decomposition Algorithms for Nonselfadjoint Elliptic and Parabolic Partial Differential Equations*, PhD thesis, Courant Institute of Mathematical Sciences, September 1989.
- [598] ———, *An additive Schwarz algorithm for nonsselfadjoint elliptic equations*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. P閏iaux, and O. B. Widlund, eds., 1990, pp. 232–244.
- [599] ———, *Additive Schwarz algorithms for parabolic convection-diffusion equations*, Numer. Math., 60 (1991), pp. 41–61.
- [600] X.-C. CAI AND M. DRYJA, *Domain decomposition methods for monotone nonlinear elliptic problems*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 21–27.
- [601] X.-C. CAI, C. FARHAT, AND M. SARKIS, *Schwarz methods for the unsteady compressible Navier–Stokes equations on unstructured meshes*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 453–460.
- [602] X.-C. CAI, C. FARHAT, AND M. SARKIS, *Variable-degree Schwarz methods for unsteady compressible flows*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 682–689.
- [603] X.-C. CAI, W. D. GROPP, AND D. E. KEYES, *A comparison of some domain decomposition algorithms for nonsymmetric elliptic problems*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 224–235.
- [604] ———, *Convergence rate estimate for a domain decomposition method*, Numer. Math., 61

- (1992), pp. 153–169.
- [605] X.-C. CAI, W. D. GROPP, D. E. KEYES, AND M. D. TIDRIRI, *Parallel implicit methods for aerodynamics*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 465–470.
- [606] X.-C. CAI, D. E. KEYES, AND V. VEKATAKRISHNAN, *Newton-Krylov-Schwarz: an implicit solver for CFD*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 387–402.
- [607] X.-C. CAI AND O. B. WIDLUND, *Domain decomposition algorithms for indefinite elliptic problems*, SIAM J. Sci. Stat. Comput., 13 (1992).
- [608] ———, *Multiplicative Schwarz algorithms for some nonsymmetric and indefinite problems*, SIAM J. Numer. Anal., 30 (1993), pp. 936–952.
- [609] ———, *Multiplicative Schwarz algorithms for some nonsymmetric and indefinite problems*, SIAM J. Numer. Anal., 30 (1993), pp. 936–952.
- [610] X.-C. CAI AND J. XU, *A preconditioned GMRES method for nonsymmetric or indefinite problems*, Math. Comp., 59 (1992), pp. 311–319.
- [611] Y. CAI AND I. M. NAVON, *Parallel domain-decomposed preconditioners in finite element shallow water flow modeling*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 471–476.
- [612] Z. CAI, C. I. GOLDSTEIN, AND J. E. PASCIAK, *Multilevel iteration for mixed finite element systems with penalty*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 1, Denver, 1991, University of Colorado, pp. 177–195.
- [613] ———, *Multilevel iteration for mixed finite element systems with penalty*, SIAM J. Sci. Comput., 14 (1993), pp. 1072–1088.
- [614] Z. CAI, R. D. LAZAROW, T. A. MANTEUFFEL, AND S. F. MCCORMICK, *First-order system least squares for second-order partial differential equations: Part i*, SIAM J. Numer. Anal., 31 (1994), pp. 1785–1802.
- [615] Z. CAI, J. MANDEL, AND S. F. MCCORMICK, *The finite volume element method for diffusion equations on general triangulations*, SIAM J. Numer. Anal., 28 (1991), pp. 392–402.
- [616] Z. CAI, T. A. MANTEUFFEL, AND S. F. MCCORMICK, *First-order system least squares for velocity-vorticity-pressure form of the Stokes equations*, Elect. Trans. Numer. Anal., 3 (1995), pp. 150–159.
- [617] ———, *First-order system least squares for the Stokes equations, with applications to linear elasticity*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 133–145.
- [618] ———, *First-order system least squares for velocity-vorticity-pressure form of the Stokes equations, with applications to linear elasticity*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 123–132.
- [619] Z. CAI AND S. F. MCCORMICK, *Computational complexity of the schwarz alternating procedure*, Int. J. High Speed Comput., 1 (1989), pp. 1–28.
- [620] ———, *On the accuracy of the finite volume element method for diffusion equations on composite grids*, SIAM J. Numer. Anal., 27 (1990), pp. 636–655.
- [621] Z. CAI, R. R. PARASHKEVOV, T. F. RUSSELL, AND X. YE, *Overlapping domain decomposition for a mixed finite element method in three dimensions*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 188–196.
- [622] J. P. CALTAGIRONE AND K. K. ABD P. ANGOT, *On a local multigrid mesh refinement method for solving Navier Stokes equations*, C.R. Acad. Sci. II, Mec. Phys. Chim. Astron., 320 (1995), pp. 295–302.
- [623] R. CAMARERO AND M. REGGIO, *Multigrid scheme for three-dimensional body-fitted coordinates in turbomachine applications*, J. Fluids Engng. Trans. ASME, 105 (83), pp. 76–82.
- [624] R. CAMARERO AND M. YOUNIS, *Efficient generation of body-fitted coordinates for cascades using multigrid*, AIAA J., 18 (1980), pp. 487–488.
- [625] L. CAMBIER, W. GHAZZI, J. P. VEUILLOT, AND H. VIVIAND, *Une approche par domaines pour le calcul d'écoulements compressibles*, in Computer Methods in Applied Sciences and Engineering V, R. Glowinski and J.-L. Lions, eds., North-Holland, Amsterdam,

- 1982, pp. 423–446.
- [626] ———, *A multi-domain approach for the computation of viscous*, in Recent Advances in Numerical Methods in Fluids, vol. 3, Pineridge, Swansea, 1984.
- [627] F. CAMILLI, M. FALCONE, P. LANUCARA, AND A. SEGHINI, *A domain decomposition method for Bellman equations*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 477–483.
- [628] W. J. CAMP AND S. J. PLIMPTON, *Mimd massively parallel methods for engineering and science problems*, in High Performance Computing Symposium 1993. Grand Challenges in Computer Simulation. Proceedings of the 1993 Simulation Multiconference on the High Performance Computing Symposium 1993, 1993, pp. 127–142.
- [629] S. L. CAMPBELL, I. C. F. IPSEN, C. T. KELLEY, AND C. D. MEYER, *GMRES and the minimizing polynomial*, BIT, 36 (1996), pp. 664–675.
- [630] D. CANRIGHT AND V. E. HENSON, *Towards an FVE-FAC method for determining thermocapillary effects on weld pool shape*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 147–166.
- [631] J. CANU AND H. RITZDORF, *Adaptive, block-structured multigrid on local memory machines*, in Adaptive Methods – Algorithms, Theory and Applications, vol. 46 of Notes on Numerical Fluid Mechanics, Braunschweig, 1994, Vieweg, pp. 84–98.
- [632] C. CANUTO AND D. FUNARO, *The Schwarz algorithm for spectral methods*, SIAM J. Numer. Anal., 25 (1988), pp. 24–40.
- [633] C. CANUTO, M. Y. HUSSAINI, A. QUARTERONI, AND T. A. ZANG, *Spectral Methods in Fluid Dynamics*, Springer-Verlag, New York, 1987.
- [634] C. CANUTO AND A. RUSSO, *Self-adaptive coupling of mathematical models and/or numerical methods*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 35–44.
- [635] S. S. CAPIZZANO AND C. T. POSSIO, *High-order finite difference schemes and Toeplitz based preconditioners for elliptic problems*, Elect. Trans. Numer. Anal., 11 (2000), pp. 55–84.
- [636] G. F. CAREY, *Parallelism in finite element modelling*, CANM, 2 (1986), pp. 281–287.
- [637] G. F. CAREY AND B. JIANG, *Element-by-element preconditioned conjugate gradient algorithm for compressible flow*, in Innovative Methods for Nonlinear Problems, W. K. Liu, T. Belytschko, and K. C. Park, eds., Pineridge Press, Swansea, UK, 1984, pp. 41–49.
- [638] G. F. CAREY AND H. KOHLI, *Shape optimization using adaptive grids and multigrid solution*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 1, Denver, 1991, University of Colorado, pp. 91–100.
- [639] G. F. CAREY, R. McLAY, M. SHARMA, AND E. BARAGGY, *Element-by-element vector and parallel computation*, CANM, 4 (1988), pp. 299–307.
- [640] G. F. CAREY AND A. PARDHANANI, *Multigrid solution of convection-diffusion problems*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 1, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 151–163.
- [641] C. CARLENZOLI, A. QUARTERONI, AND A. VALLI, *Spectral domain decomposition methods for compressible Navier-Stokes equations*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 441–450.
- [642] B. CARPENTIERI, I. S. DUFF, AND L. GIRAUD, *Sparse pattern selection strategies for robust Frobenius norm minimization preconditioners in electromagnetism*, Numer. Lin. Alg. Appl., 7 (2000), pp. 667–685.
- [643] G. CARRÉ, G. CARTE, H. GUILLARD, AND S. LANTERI, *Multigrid strateegies for CFD problems on non-structured meshes*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 1–10.
- [644] P. M. CARTER, *Computational Methods for the Shape from Shading Problem*, PhD thesis, University of British Columbia, Vancouver, B.C. Canada, 1993.
- [645] L. M. CARVALHO AND L. GIRAUD, *Additive Schwarz for the Schur complement method*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 304–310.
- [646] L. M. CARVALHO, L. GIRAUD, AND G. A. MEURANT, *Local preconditioners for two-level non-*

overlapping domain decomposition methods, Numer. Lin. Alg. Appl., 8 (2001), pp. 207–227.

- [647] M. CASARIN, *Quasi-optimal Schwarz methods for the conforming spectral element discretization*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 167–182.
- [648] M. A. CASARIN, *Schwarz preconditioners for the spectral element Stokes and Navier–Stokes discretizations*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 72–79.
- [649] M. A. CASARIN AND O. B. WIDLUND, *A preconditioner for the mortar finite element method*, Elect. Trans. Numer. Anal., 4 (1996), pp. 75–88.
- [650] L. A. CATALANO, P. DE PALMA, M. NAPOLITANO, AND G. PASCAZIO, *A multidimensional upwind solution adaptive multigrid solver for inviscid cascades*, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 151–162.
- [651] L. A. CATALANO, M. NAPOLITANO, AND H. DECONINCK, *Optimal multistage schemes for multigrid smoothing of two-dimensional advection operators*, Comm. Appl. Num. Methods, 8 (1992), pp. 785–795.
- [652] L. A. CATALANO, P. D. PALMA, AND M. NAPOLITANO, *Explicit multigrid smoothing for multidimensional upwinding of the Euler equations*, in Notes on Numerical Fluid Mechanics, vol. 35, Vieweg, Braunschweig, 1992, pp. 69–78.
- [653] D. A. CAUGHEY, *Multi-grid calculation of three-dimensional transonic potential flows*, Appl. Math. Comput., 13 (1983), pp. 241–260.
- [654] ———, *Implicit multigrid techniques for compressible flows*, Comput. Fluids, 22 (1993), pp. 117–124.
- [655] D. A. CAUGHEY AND R. K. IYER, *Diagonal implicit multigrid calculation of inlet flowfields*, AIAA J., 27 (1988), pp. 110–112.
- [656] K. J. CAVANAUGH AND V. E. HENSON, *A multilevel cost-space approach to solving the balance long transportation problem*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 61–75.
- [657] J. C. CAVENDISH, *Automatic triangulation of arbitrary planar domains for the finite element method*, Int. J. Numer. Meth. Engng., 8 (1974), pp. 679–696.
- [658] R. M. A. CHALABI AND P. J. TURINSKY, *Application of multigrid method to solving the NEM form of multigroup neutron diffusion equation*, Trans. Am. Nucl. Soc., 71 (1994), pp. 259–261.
- [659] L. CHAMPANEY, J.-Y. COGNARD, D. DUREISSEIX, AND P. LADEVÈZE, *3D structures assembly analysis with a modular approach suited to parallel computations*, in 28th International Symposium on Automotive Technology and Automation, Stuttgart, 1995, pp. 285–292.
- [660] L. CHAMPANEY, J.-Y. COGNARD, D. DUREISSEIX, AND P. LADEVÈZE, *Numerical experiments of parallel strategies in structural non-linear analysis*, Calculateurs Parallèles, 8 (1996), pp. 245–249.
- [661] ———, *Large scale applications on parallel computers of a mixed domain decomposition method*, Computational Mechanics, 19 (1997), pp. 253–263.
- [662] T. F. CHAN, *Analysis of preconditioners for domain decomposition*, SIAM J. Numer. Anal., 24 (1987), pp. 382–390.
- [663] ———, *Analysis of a parallel multigrid algorithm*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 1, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 165–180.
- [664] ———, *Boundary probe domain decomposition preconditioners for fourth order problems*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 160–167.
- [665] ———, *Domain decomposition algorithms and computational fluid dynamics*, in Vector and Parallel Computing: issues in applied research and development, Ellis Horwood Ltd. (John Wiley & Sons), Chichester, 1989, pp. 65–82.
- [666] ———, *Hierarchical algorithms and architectures for parallel scientific computing*, in Proceedings of the ACM International Conference on Supercomputing, Amsterdam, The Netherlands, New York, 1990, ACM, pp. 318–329.
- [667] ———, *Fourier analysis of relaxed incomplete factorization preconditioners*, SIAM J. Sci. Stat. Comp., 12 (1991), pp. 668–680.
- [668] T. F. CHAN, E. GALLOPOULOS, V. SIMONCINI, T. SZETO, AND C. TONG, *QMRCGSTAB: A*

- quasi-minimal residual variant of the Bi-CGSTAB algorithm for nonsymmetric systems*, SIAM J. Sci. Comput., 15 (1993), pp. 338–347.
- [669] T. F. CHAN, R. GLOWINSKI, J. PÉRIAUX, AND O. B. WIDLUND, *Domain Decomposition Methods*, SIAM, Philadelphia, 1989.
- [670] ———, *Third International Symposium on Domain Decomposition Methods for Partial Differential Equations*, SIAM, Philadelphia, 1990.
- [671] T. F. CHAN, S. GO, AND J. ZOU, *Multilevel domain decomposition and multigrid methods for unstructured meshes: algorithms and theory*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 159–176.
- [672] T. F. CHAN AND D. GOOVAERTS, *A note on the efficiency of domain decomposed incomplete factorizations*, SIAM J. Sci. Stat. Comp., 11 (1990), pp. 794–803.
- [673] ———, *On the relationship between overlapping and nonoverlapping domain decomposition methods*, SIAM J. Matrix Anal. Appl., 13 (1992), pp. 663–670.
- [674] T. F. CHAN, T. HOU, AND P. L. LIONS, *Geometry-independent convergence results for domain decomposition algorithms*, SIAM J. Numer. Anal., 28 (1991), pp. 378–391.
- [675] T. F. CHAN AND K. R. JACKSON, *The use of iterative linear equation solvers in codes for systems of stiff IVPs for ODEs*, SIAM J. Sci. Stat. Comput., 7 (1986), pp. 378–417.
- [676] T. F. CHAN AND H. B. KELLER, *Arc-length continuation and multi-grid techniques for nonlinear elliptic eigenvalue problems*, SIAM J. Sci. Stat. Comput., 3 (1982), pp. 173–194.
- [677] T. F. CHAN AND D. E. KEYES, *Interface preconditionings for domain-decomposed convection-diffusion operators*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Péliaux, and O. B. Widlund, eds., Philadelphia, 1990, SIAM, pp. 245–262.
- [678] T. F. CHAN, C. C. J. KUO, AND C. TONG, *Parallel elliptic preconditioners: Fourier analysis and performance on the Connection Machine*, Comput. Phys. Commun., 53 (1989), pp. 237–252.
- [679] T. F. CHAN AND T. P. MATHEW, *An application of the probing technique to the vertex space method in domain decomposition*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Péliaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 101–111.
- [680] ———, *The interface probing technique in domain decomposition*, SIAM J. Matrix Anal. Appl., 13 (1992), pp. 212–238.
- [681] ———, *Domain Decomposition Algorithms*, vol. 3 of Acta Numerica, Cambridge University Press, Cambridge, 1994, pp. 61–143.
- [682] ———, *Domain decomposition preconditioners for convection diffusion problems*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 157–175.
- [683] T. F. CHAN, T. P. MATHEW, AND J.-P. SHAO, *Fourier and probe variants of the vertex space domain decomposition algorithm*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 236–249.
- [684] T. F. CHAN AND D. C. RESASCO, *Analysis of domain decomposition preconditioners on irregular regions*, in Proceedings of the Sixth IMACS Int'l Symp. on Computer Methods for Partial Differential Equations, R. Vichnevetski and R. Stepleman, eds., New York, 1987, IMACS.
- [685] ———, *A domain-decomposed fast Poisson solver on a rectangle*, SIAM J. Sci. Stat. Comput., 8 (1987), pp. 14–26.
- [686] ———, *Hypercube implementation of domain decomposed fast Poisson solvers*, in Proceedings of the Second Conference on Hypercube Multiprocessors, M. Heath, ed., Philadelphia, 1987, SIAM Books.
- [687] ———, *A framework for the analysis and construction of domain decomposition preconditioners*, in First International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. Péliaux, eds., Philadelphia, 1988, SIAM, pp. 217–230.
- [688] T. F. CHAN AND Y. SAAD, *Multigrid algorithms on the hypercube multiprocessor*, IEEE Trans. Comput., C-35 (1986), pp. 969–977.

- [689] T. F. CHAN AND R. SCHREIBER, *Parallel networks for multi-grid algorithms: architecture and complexity*, SIAM J. Sci. Stat. Comput., 6 (1985), pp. 698–711.
- [690] T. F. CHAN AND J. P. SHAO, *Parallel complexity of domain decomposition methods and optimal coarse grid size*, Parallel Comput., 21 (1995), pp. 1033–1049.
- [691] T. F. CHAN AND I. SHARPOV, *Subspace correction multilevel methods for elliptic eigenvalue problems*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 311–317.
- [692] T. F. CHAN AND B. F. SMITH, *Domain decomposition and multigrid algorithms for elliptic problems on unstructured meshes*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 175–189.
- [693] ———, *Domain decomposition and multigrid algorithms for elliptic problems on unstructured meshes*, Elect. Trans. Numer. Anal., 2 (1994), pp. 171–182.
- [694] T. F. CHAN, W. P. TANG, AND W. L. WAN, *Wavelet sparse approximate inverse preconditioners*, BIT, 37 (1997), pp. 644–660.
- [695] T. F. CHAN AND R. S. TUMINARO, *Design and implementation of parallel multigrid algorithms*, in Proceedings of the Third Copper Mountain Conference on Multigrid Methods, S. F. McCormick, ed., New York, 1987, Marcel Dekker, pp. 101–115.
- [696] ———, *Multigrid algorithms on hypercube processors*, in Proceedings of the Second Conference on Hypercube Multiprocessors, M. Heath, ed., Philadelphia, 1987, SIAM, pp. 730–737.
- [697] ———, *A survey of parallel multigrid algorithms*, in Proceedings of the Symposium on Parallel Computations and their Impact on Mechanics, New York, 1987, ASME.
- [698] ———, *Analysis of a parallel multigrid algorithm*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 66–86.
- [699] T. F. CHAN AND P. VANEK, *Detection of strong coupling in algebraic multigrid solvers*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 11–23.
- [700] D. CHANG, *On convergence of the parallel Schwarz algorithm with pseudo-boundary and the parallel multisplitting interactive method*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 251–258.
- [701] K. W. CHANG AND F. A. HOWES, *Nonlinear Singular Perturbation Phenomena: Theory and Applications*, Springer-Verlag, New York, 1984.
- [702] L. CHANG, T. F. VONRY, AND C. CUSANO, *An efficient, robust, multi-level computational algorithm for elastohydrodynamic lubrication*, J. Tribol., 111 (1989), pp. 193–199.
- [703] Q.-S. CHANG, *Using a predictor-corrector scheme to computer Navier–Stokes equations in three-dimensional spherical coordinates*, J. Comput. Math., 6 (1988), pp. 307–317.
- [704] I. CHARPENTIER, F. D. VUYST, AND Y. MADAY, *The overlapping component mode synthesis method: the shifted eigenmodes strategy and the case of selfadjoint operators with discontinuous coefficients*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 583–596.
- [705] P. CHARRIER, J. ROMAN, AND P. VEZOLLE, *Implementation of a symmetric boundary element method on distributed memory computers for 3D Maxwell equations*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North-Holland), Amsterdam, 1995, pp. 505–512.
- [706] M. S. CHARRON AND M. C. MARCHE, *Une génération interactive des données pour appliquer la méthode des éléments finis*, Canad. J. Ci. Engng., 11 (1984).
- [707] T. CHARVET, F. HAUVILLE, AND S. HUBERSON, *Linear/nonlinear decomposition of unsteady flow*, C. R. Acad. Sci. II, Mec. Phys. Chim. Astron., 318 (1994), pp. 1019–1026.
- [708] F. CHATELIN, *Simultaneous Newton's iteration for the eigenproblem*, in Defect Correction Methods: Theory and Applications, K. Böhmer and H. J. Stetter, eds., Computing Suppl. 5, Springer-Verlag, Vienna, 1984, pp. 67–74.
- [709] F. CHATELIN AND R. LEBBAR, *Superconvergence results for the iterated projection method applied to Fredholm integral equations of the second kind and the corresponding Eigenvalue problems*, J. Int. Eqns., 6 (1984), pp. 71–91.
- [710] F. CHATELIN AND W. L. MIRANKER, *Acceleration by aggregation of successive approximation methods*, J. Lin. Alg. Applic., 24 (1980), pp. 17–47.
- [711] ———, *Acceleration by aggregation of successive approximation methods*, J. Lin. Alg. Applic.,

- 43 (1982), pp. 17–47.
- [712] D. CHAZAN AND W. L. MIRANKER, *Chaotic relaxation*, J. Lin. Alg. Applic., 2 (1969), pp. 199–222.
- [713] J. G. CHEFTER, C. K. CHU, AND D. E. KEYES, *Domain decomposition for the shallow water equations*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 485–490.
- [714] H. C. CHEN, *The SAS Domain Decomposition Method for Structural Analysis*, PhD thesis, Univ. of Illinois at Urbana–Champaign, Urbana, Illinois, 1988.
- [715] H. C. CHEN AND A. F. HE, *Vectorization and parallelization of the finite strip method for dynamic Mindlin plate problems*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 77–91.
- [716] H. C. CHEN AND V. C. PATEL, *Laminar flow at the trailing edge of a flat plate*, AIAA J., 25 (1987), pp. 920–928.
- [717] H. C. CHEN AND A. H. SAMEH, *A matrix decomposition method for orthotropic elasticity problems*, SIAM J. Matrix Anal. Appl., 10 (1989), pp. 39–64.
- [718] H. M. CHEN AND F. C. BERRY, *Parallel load-flow algorithm using a decomposition method for space-based power systems*, IEEE Trans. Aero. Electron. Sys., 29 (1993), pp. 1024–1030.
- [719] K. CHEN, *Efficient iterative solution of linear systems from discretizing singular integral equations*, Elect. Trans. Numer. Anal., 2 (1994), pp. 76–91.
- [720] ———, *Preconditioning of two-dimensional singular integral equations*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 390–396.
- [721] ———, *Solution of singular boundary element equations based on domain splitting*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 43–50.
- [722] L. T. CHEN, K. C. YU, AND T. Q. DANG, *Transonic computational method for an aft-mounted nacelle/pylon with power effect*, J. Aircr., 27 (1990), pp. 878–885.
- [723] M. CHEN AND R. TEMAM, *Incremental unknowns for solving partial differential equations*, Numer. Math., 59 (1991), pp. 255–271.
- [724] ———, *Nonlinear Galerkin method in the finite difference case and wavelet like incremental unknowns*, Numer. Math., 64 (1993), pp. 271–294.
- [725] Z. CHEN, *The convergence on the multigrid algorithm for Navier-Stokes equations*, J. Comput. Math., 5 (1987), pp. 227–237.
- [726] ———, *Analysis of mixed methods using conforming and nonconforming finite element methods*, RAIRO, Math. Mod. Num. Anal., 27 (1993), pp. 9–34.
- [727] ———, *Projection finite element methods for semiconductor device equations*, Comput. Math. Appl., 25 (1993), pp. 81–88.
- [728] ———, *The analysis of intergrid transfer operators and multigrid methods for nonconforming finite elements*, Elect. Trans. Numer. Anal., 6 (1997), pp. 78–96.
- [729] Z. CHEN AND R. E. EWING, *Recent development of multigrid algorithms for mixed and nonconforming methods for second order elliptic problems*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 183–197.
- [730] ———, *Domain decomposition methods and multilevel preconditioners for nonconforming and mixed methods for partial differential problems*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 213–220.
- [731] H.-P. CHENG AND G.-T. YEH, *Study using the multigrid method to solve the Richard's equation with finite element discretization*, in International Conference on Computational Methods in Water Resources, vol. 1, Southampton, 1996, Computational Mechanics Publishing, pp. 543–549.
- [732] I.-L. CHERN, J. GLIMM, O. MCBRYAN, B. PLOHR, AND S. YANIV, *Front tracking for gas dynamics*, J. Comput. Phys., 62 (1986), pp. 83–110.
- [733] G. CHESSIRE AND W. D. HENSHAW, *Composite overlapping meshes for the solution of partial differential equations*, J. Comput. Phys., 90 (1990), pp. 1–64.
- [734] G. CHESSIRE AND A. JAMESON, *FLO87 on the iPSC/2: A parallel multigrid solver for the*

- Euler equations*, in Proceedings of the Fourth Conference on Hypercubes, Concurrent Computers and Applications, Golden Gate Enterprises, 1990, pp. 957–966.
- [735] K. Y. CHIEN, *Prediction of channel and boundary-layer flows with a low-Reynolds-number turbulence model*, AIAA J., 20 (1982), pp. 33–38.
- [736] E. D. CHIKLIWALA AND Y. C. YORTSOS, *Application of orthogonal mapping to some two-dimensional domains*, J. Comput. Phys., 57 (1985), pp. 391–402.
- [737] R. V. CHIMA AND G. M. JOHNSON, *Efficient solution of the Euler and Navier-Stokes equations with a vectorized multi-grid algorithm*, AIAA, 83-1893 (1983).
- [738] ———, *Efficient solution of the Euler and Navier-Stokes equations with a vectorized multiple-grid algorithm*, AIAA J., 23 (1985), pp. 23–32.
- [739] R. V. CHIMA, E. TURKEL, AND S. SCHAFER, *Comparison of three explicit multigrid methods for the Euler and Navier-Stokes equations*, AIAA, 87-0602 (1987).
- [740] R. C. Y. CHIN AND G. W. HEDSTROM, *Domain decomposition: an instrument of asymptotic-numerical methods*, in Asymptotic analysis and the numerical solution of partial differential equations, Amsterdam, 1991, Marcel-Dekker, pp. 33–54.
- [741] R. C. Y. CHIN, G. W. HEDSTROM, AND F. A. HOWES, *Considerations on solving problems with multiple scales*, in Multiple Time Scales, Academic Press, Orlando, Florida, 1985, pp. 1–27.
- [742] R. C. Y. CHIN, G. W. HEDSTROM, J. R. McGRAW, AND F. A. HOWES, *Parallel computation of multiple-scale problems*, in New Computing Environments: Parallel, Vector, and Systolic, A. Wouk, ed., SIAM, Philadelphia, 1986, pp. 136–153.
- [743] R. C. Y. CHIN, G. W. HEDSTROM, J. S. SCROGGS, AND D. C. SORENSEN, *Parallel computation of a domain decomposition method*, Adv. Comp. Meth. Partial Dif. Eq., 6 (1987), pp. 375–381.
- [744] R. C. Y. CHIN AND R. KRASNY, *A hybrid asymptotic-finite element method for stiff two-point boundary value problems*, SIAM J. Sci. Stat. Comput., 4 (1983), pp. 229–243.
- [745] R. C. Y. CHIN AND W.-M. LIU, *Domain decomposition method and slow passage through a Hopf bifurcation*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 250–257.
- [746] M. H. CHOU, *An efficient scheme for unsteady flow past an object with boundary conformal to a circle*, SIAM J. Sci. Stat. Comput., 13 (1992), pp. 860–873.
- [747] C. S. CHOW AND J. N. TSITSIKLIS, *An optimal one-way multigrid algorithm for discrete-time stochastic control*, IEEE Trans. Autom. Control, 36 (1991), pp. 898–914.
- [748] E. CHOW, A. J. CLEARY, AND R. D. FALGOUT, *Design of the hypre preconditioner library*, in Proceedings of the SIAM Workshop on Object Oriented Methods for Inter-operable Scientific and Engineering Computing, vol. 99 of Proceedings in Applied Mathematics, Philadelphia, 1998, SIAM Books.
- [749] N. P. CHRISOCHOIDES, *On the Mapping of PDE Computations to Distributed Memory Machines*, PhD thesis, Purdue University, 1991.
- [750] N. P. CHRISOCHOIDES, G. FOX, AND J. THOMPSON, *MENUS-PGG: A mapping environment for unstructured numerical parallel grid generation*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 381–386.
- [751] N. P. CHRISOCHOIDES, C. E. HOUSTIS, E. N. HOUSTIS, S. K. KORTESIS, AND J. R. RICE, *Automatic load balanced partitioning strategies for PDE computations*, in Proceedings of International Conference on Supercomputing, E. N. Houstis and D. Gannon, eds., New York, 1989, ACM Publications, pp. 99–107.
- [752] N. P. CHRISOCHOIDES, C. E. HOUSTIS, E. N. HOUSTIS, P. N. PAPACHIOU, AND S. K. KORTESIS, *Domain decomposer: a software tool for mapping PDE computations to parallel architectures*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 341–357.
- [753] C. CHRISTARA AND B. F. SMITH, *Multigrid and multilevel methods for quadratic spline collocation*, BIT, 37 (1997), pp. 781–803.
- [754] Z. D. CHRISTIDIS, *Parallel computing at IBM research on geophysical applications*, in Proceedings of the Fifth ECMWF Workshop on the Use of Parallel Processors in Meteorology. Parallel Supercomputing in Atmospheric Science, G. R. Hoffman and T. Kauranne, eds., Singapore, 1993, World Scientific, pp. 44–59.
- [755] A. CHRONOPoulos AND D. KINCAID, *On the Odir iterative method for nonsymmetric indefinite linear systems*, Numer. Lin. Alg. Appl., 8 (2001), pp. 71–82.

- [756] D. CHU AND X. HU, *Domain decomposition algorithms for a generalized Stokes problem*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 461–467.
- [757] P. G. CIARLET, *The Finite Element Method for Elliptic Problems*, North-Holland, Amsterdam, New York, 1978.
- [758] P. G. CIARLET, JR., *Etude de préconditionnements parallèles pour la résolution d'équations aux dérivées partielles elliptiques. Une décomposition de l'espace $L^2(\Omega)$* , PhD thesis, University of Paris, Paris, 1992.
- [759] P. G. CIARLET, JR., *A comparison of three iterative algorithms based on domain decomposition methods*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 387–393.
- [760] ———, *Implementation of a domain decomposition method well suited for (massively) parallel architectures*, Int. J. High Speed Comput., 6 (1994), pp. P157–182.
- [761] P. G. CIARLET JR., F. LAMOUR, AND B. F. SMITH, *On the influence of partitioning schemes on the efficiency of overlapping domain decomposition methods*, in Proceedings of the 5th Symposium on the Frontiers of Massively Parallel Computation. Frontiers of Massively Parallel Computation 1995, Los Alamitos, CA, 1995, IEEE, pp. 375–383.
- [762] P. G. CIARLET, JR. AND G. A. MEURANT, *A class of domain decomposition preconditioners for massively parallel computers*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 353–359.
- [763] M.-C. CICCOLI, J. A. DESIDERI, AND J. PÉRIAUX, *Introduction of domain decomposition techniques in time-dependent flow problems*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 433–439.
- [764] M.-C. CICCOLI AND R. L. TROTTA, *Multidomain finite elements and finite volumes for advection-diffusion equations*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 540–547.
- [765] P. E. CIESIELSKI, S. R. FULTON, AND W. H. SCHUBERT, *Multigrid solution of an elliptic boundary value problem from tropical cyclone theory*, Mon. Wea. Rev., 114 (1986), pp. 797–807.
- [766] P. CIGNONI, D. LAFORENZA, R. PEREGO, R. SCOPIGNO, AND C. MONTANI, *Evaluation of parallelization strategies for an incremental Delaunay triangulator in E**3*, Concurrency, Pract. Exp., 7 (1995), pp. 61–80.
- [767] J. CIHLAR AND P. ANGOT, *Numerical solution of Navier-Stokes systems*, Numer. Lin. Alg. Appl., 6 (1999), pp. 17–27.
- [768] M. CIMENT, *Stable difference schemes with uneven mesh spacings*, Math. Comp., 25 (1971), pp. 219–227.
- [769] A. R. CLARE AND D. P. STEVENS, *Implementing finite difference ocean circulation models on MIMD, distributed memory computers*, Future Gen. Comput. Sys., 9 (1993), pp. 11–18.
- [770] T. L. CLARK AND W. D. HALL, *Mulit-domain simulations of the time dependent Navier-Stokes equattns: benchmark error analysis of some nesting procedures*, J. Comput. Phys., 92 (1989), pp. 456–481.
- [771] T. W. CLARK, R. v. HANXLEDEN, J. A. MCCAMMON, AND L. R. SCOTT, *Parallelizing molecular dynamics using spatial decomposition*, in Proceedings of the Scalable High-Performance Computing Conference, IEEE Computer Soc. Press, 1994, pp. 95–102.
- [772] R. W. CLAUS AND S. P. VANKA, *Multigrid calculations of a jet in crossflow*, J. Propul. Power, 8 (1992), pp. 425–431.
- [773] S. S. CLIFT AND W.-P. TANG, *Weighted graph based ordering techniques for preconditioned conjugate gradient methods*, BIT, 35 (1995), pp. 30–47.
- [774] K. H. COATS AND A. D. MODINE, *A consistent method for calculating transmissibilities in nine-point difference equations*, SPE paper, 12248 (1983).
- [775] K. H. COATS AND A. B. RAMESH, *Effects of grid type and difference scheme on pattern steamflood simulation results*, SPE paper, 11079 (1982).
- [776] P. COELHO, J. C. F. PEREIRA, AND M. G. CARVALHO, *Calculation of laminar recirculation flows using a local non-staggered grid refinement system*, Int. J. Numer. Meth. Fluids, 12 (1991), pp. 535–557.

- [777] J.-Y. COGNARD, D. DUREISSEIX, P. LADEVÈZE, AND P. LORONG, *Expérimentation d'une approche parallèle en calcul de structures*, Rev. Europ. Éléments Finis, 5 (1996), pp. 197–220.
- [778] C. R. COLLINS, *Computations of twinning in shape-memory materials*, in Proceedings of SPIE – The International Society for Optical Engineering, vol. 1919, Bellingham, WA, 1993, Society of Photo-Optical Instrumentation Engineers, pp. 30–37.
- [779] P. CONCUS, G. H. GOLUB, AND G. A. MEURANT, *Block preconditioning for the conjugate gradient method*, SIAM J. Sci. Stat. Comput., 6 (1985), pp. 220–252.
- [780] P. CONCUS, G. H. GOLUB, AND D. P. O'LEARY, *A generalized conjugate gradient method for the numerical solution of elliptic PDE*, in Sparse Matrix Computations, J. R. Bunch and D. J. Rose, eds., Academic Press, New York, 1976, pp. 309–332.
- [781] S. D. CONNELL AND D. G. HOLMES, *Three dimensional unstructured adaptive multigrid scheme for the Euler equations*, AIAA J., 32 (1994), pp. 1626–1632.
- [782] P. CONRADI AND D. SCHRÖDER, *Concepts for a dimension independent application of multi-grid algorithms to semiconductor device simulation*, in Robust Multi-Grid Methods, W. Hackbusch, ed., vol. 23 of Notes on Numerical Fluid Mechanics, Braunschweig, 1989, Vieweg, pp. 48–57.
- [783] G. B. COOK, M. W. CHOPTUIK, M. R. DUBAL, S. KLASKY, R. A. MATZNER, AND S. R. OLIVEIRA, *Three dimensional initial data for the collision of two black holes*, Phys. Rev. D, Part. Fields Gravit. Cosmol., 47 (1993), pp. 1471–1490.
- [784] R. K. COOMER, *Parallel Iterative Methods in Semiconductor Device Modelling*, PhD thesis, University of Bath, Bath, 1994.
- [785] R. K. COOMER AND I. G. GRAHAM, *Domain decomposition methods for device modelling*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 491–496.
- [786] G. COOPERMAN, *Practical task-oriented parallelism for Gaussian elimination in distributed memory*, Lin. Alg. Appl., 275 (1998), pp. 107–120.
- [787] M. COSTABEL, *Symmetric methods for the coupling of finite elements and boundary elements*, in Boundary Elements IX, C. A. Brebbia, W. L. Wendland, and G. Kuhn, eds., vol. 1, Springer-Verlag, 1987, pp. 411–420.
- [788] ———, *Boundary integral operators on Lipschitz domains: Elementary results*, SIAM J. Math. Anal., 19 (1988), pp. 613–626.
- [789] A. COSTINER AND S. TA'ASAN, *Adaptive multigrid techniques for large scale eigenvalue problems: solutions of the Schrödinger problem in two and three dimensions*, Phys. Rev. E, Stat. Phys. Plasmas Fluids Relat. Interdiscip. Top., 51 (1995), pp. 3704–3717.
- [790] R. W. COTTLE, *Manifestations of the Schur complement*, J. Lin. Alg. Applic., 8 (1974), pp. 189–211.
- [791] V. COUAILLER AND R. PEYRET, *Theoretical and numerical study of Ni's multigrid method*, Rech. Aéospace, (1985), pp. 9–24.
- [792] O. COULAUD, D. FUNARO, AND O. KAVIAN, *Laguerre spectral approximation of elliptic problems in exterior domains*, in Proceedings of the ICOSAHOM, Como, June 26/29, 1989, Amsterdam, 1989, North-Holland, pp. 451–458.
- [793] F. COULOMB, *Domain decomposition and mixed finite elements for the neutron diffusion equation*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 295–313.
- [794] ———, *Domain decomposition and associate Block-Jacobi method for the diffusion equation*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1990, SIAM, pp. 410–427.
- [795] L. C. COWSAR, *Domain decomposition methods for nonconforming finite element spaces of LaGrange-type*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 93–109.
- [796] L. C. COWSAR, A. WEISER, AND M. F. WHEELER, *Parallel multigrid and domain decomposition algorithms for elliptic equations*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 376–385.
- [797] L. C. COWSAR AND M. F. WHEELER, *Parallel domain decomposition method for mixed finite elements for elliptic partial differential equations*, in Fourth International Symposium

- on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Péliau, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 358–372.
- [798] A. W. CRAIG AND O. C. ZIENKIEWICZ, *A multigrid algorithm using a hierarchical finite element basis*, in Multigrid Methods for Integral and Differential Equations, D. J. Paddon and H. Holstein, eds., The Institute of Mathematics and its Applications Conference Series 3, Clarendon Press, Oxford, 1985, pp. 301–312.
- [799] P. E. CRANDALL AND M. J. QUINN, *Three dimensional grid partitioning for network parallel processing*, in 22nd Annual 1994 ACM Computer Science Conference. Scaling Up: Meeting the Challenge of Complexity in Real World Computing Applications. Proceedings, 1994, pp. 210–217.
- [800] ———, *Non-uniform 2-D grid partitioning for heterogeneous parallel architectures*, in IEEE Symposium on Parallel and Distributed Processing, Los Alamitos, CA, 1995, IEEE, pp. 428–435.
- [801] A. CRISTOFOLINI AND C. C. A. BORghi, *Difference method for the solution of the electrodynamic problem in a magnetohydrodynamic field*, IEEE Trans. Magn., 31 (1995), pp. 1749–1752.
- [802] L. CRIVELLI AND C. FARHAT, *Implicit transient finite element structural computations on MIMD systems: FETI v.s. direct solvers*, in 34th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference. Collection of Technical Papers – AIAA/ASME Structures, Structural Dynamics and Materials Conference, vol. 1, Washington, DC, 1993, AIAA, pp. 118–130.
- [803] J.-M. CROS AND F. LÉNÉ, *Parallel iterative methods for large-scale eigenvalue problems in structural dynamics*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 318–325.
- [804] M. CROUZEIX AND P.-A. RAVIART, *Confirming and nonconforming finite element methods for solving the stationary Stokes equations I*, RAIRO Anal. Numer., 7 (1973), pp. 33–76.
- [805] P. I. CRUMPTON, G. J. SHAW, AND A. F. WARE, *Discretisation and multigrid solution of elliptic equations with mixed derivative terms and strongly discontinuous coefficients*, J. Comput. Phys., 116 (1995), pp. 343–358.
- [806] A. M. CUFFE, C.-H. LAI, AND K. A. PERICLEOUS, *Adaptive zonal recognition for viscous/inviscid coupling*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 690–697.
- [807] M. C. CURRAN, *An iterative finite-element collocation method for parabolic problems using domain decomposition*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 245–253.
- [808] C. CUVELIER, *On the computation of free boundaries*, in Research in Numerical Fluid Mechanics, P. Wesseling, ed., vol. 17 of Notes on Numerical Fluid Mechanics, Braunschweig, 1987, Vieweg, pp. 18–29.
- [809] M. CZAJKOWSKI, *Solution of an initial control problem for the shallow water equations by a multi-grid method*, in 5th European Multigrid Conference Special Topics and Applications, University of Stuttgart, Stuttgart, 1998, pp. 5–17.
- [810] D. DABDUB AND J. H. SEINFELD, *Air quality modeling on massively parallel computers*, Atmospheric Environment, 28 (1994), pp. 1679–1687.
- [811] L. DAGUM, *Automatic partitioning of unstructured grids into connected components*, in Proceedings of the Supercomputing Conference 1993, Los Alamitos, 1993, IEEE, Computer Society Press, pp. 94–101.
- [812] H. K. DAHLE, T. O. W. JOHANSEN, T. BOTNEN, AND X.-C. TAI, *A characteristic domain decomposition method for modeling flow in a coastal aquifer*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 698–707.
- [813] S. DAHLKE, R. HOCHMUTH, AND K. URBAN, *Convergent adaptive wavelet methods for the Stokes problem*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 66–72.
- [814] S. DAHLKE AND A. KUNOTH, *Biorthonal wavelets and multigrid*, in Adaptive Methods – Algorithms, Theory and Applications, vol. 46 of Notes on Numerical Fluid Mechanics, Braunschweig, 1994, Vieweg, pp. 99–119.
- [815] G. DAHLQUIST, *Error analysis for a class of methods for stiff non-linear initial value problems*, in Lecture Notes in Mathematics, vol. 506, Springer-Verlag, New York, 1975, pp. 60–74.
- [816] ———, *A ‘multigrid’ extension of the FFT for the numerical inversion of Fourier and*

- Laplace transforms*, BIT, 33 (1993), pp. 85–112.
- [817] W. DAHMEN AND L. ELSNER, *Algebraic multigrid methods and the Schur complement*, in Robust Multi-Grid Methods, W. Hackbusch, ed., vol. 23 of Notes on Numerical Fluid Mechanics, Braunschweig, 1989, Vieweg, pp. 58–68.
 - [818] W. DAHMEN AND A. KUNOTH, *Multilevel preconditioning*, Numer. Math., 63 (1992), pp. 315–344.
 - [819] W. DAHMEN, A. KUNOTH, AND K. URBAN, *A wavelet Galerkin method for the Stokes equations*, Computing, 56 (1996), pp. 259–302.
 - [820] P. G. DANIELS AND P. P. WANG, *Numerical study of thermal convection in tall laterally heated*, Int. J. Heat Mass Transf., 37 (1994), pp. 375–386.
 - [821] J. H. DARR AND S. P. VANKA, *Separated flow in a driven trapezoidal cavity*, Phys. Fluids A, Fluid Dyn., 3 (1991), pp. 385–392.
 - [822] R. DAS, D. J. MAVRIPLIS, J. H. SALTZ, S. GUPTA, AND R. PONNUSAMY, *Design and implementation of a parallel unstructured Euler solver using software primitives*, AIAA J., 32 (1994), pp. 489–496.
 - [823] I. DAUBECHIES, *Ten Lectures on Wavelets*, vol. 61 of CBMS–NSF Regional Conference Series in Applied Mathematics, SIAM Books, Philadelphia, 1992.
 - [824] R. DAUTRAY AND J.-L. LIONS, *Analyse mathématique et calcul numérique pour les sciences et techniques*, Masson, Paris, 1985.
 - [825] M. B. DAVIS AND G. F. CAREY, *Iterative solution of the stream function vorticity equations using a multigrid solver with finite elements*, Comm. Numer. Meth. Engrg., 9 (1993), pp. 587–594.
 - [826] ———, *Parallel element by element spectral multilevel techniques for finite elements*, in Parallel Processing for Scientific Computing, SIAM Proceedings, Philadelphia, 1995, SIAM, pp. 393–394.
 - [827] ———, *A parallel multilevel spectral element scheme*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 213–225.
 - [828] P. J. DAVIS AND P. RABINOWITZ, *Methods of Numerical Integration*, Academic Press, London, New York, 1984.
 - [829] R. L. DAVIS, *The prediction of compressible laminar viscous flows using a time marching control-volume and multi grid technique*, AIAA, 83–1896 (1983).
 - [830] K. DAVSTAD, *A multigrid conjugate residual method for the numerical solution of the Hartree Fock equation for diatomic molecules*, J. Comput. Phys., 99 (1992), pp. 33–38.
 - [831] A. S. DAWOOD AND P. J. BURNS, *Steady three dimensional convective heat transfer in a porous box via multigrid*, Numer. Heat Transf. A, Appl., 22 (1992), pp. 167–198.
 - [832] C. N. DAWSON, *The performance of an explicit/implicit domain decomposition procedure for parabolic equations on an Intel hypercube*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 386–393.
 - [833] C. N. DAWSON AND Q. DU, *A domain decomposition method for parabolic equations based on finite elements*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 255–263.
 - [834] C. N. DAWSON AND T. F. DUPONT, *Explicit/implicit, conservative domain decomposition procedures for parabolic problems based on block-centered finite differences*, SIAM J. Numer. Anal., 31 (1994), pp. 1045–1061.
 - [835] ———, *Noniterative domain decomposition for second order hyperbolic problems*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 45–52.
 - [836] C. N. DAWSON AND M. F. WHEELER, *Two-grid methods for mixed finite element approximations of nonlinear parabolic equations*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 191–203.
 - [837] P. M. DE ZEEUW, *Matrix-dependent prolongations and restrictions in a blackbox multigrid solver*, J. Comput. Appl. Math., 33 (1990), pp. 1–27.
 - [838] ———, *Nonlinear multigrid applied to a one-dimensional stationary semiconductor model*, SIAM J. Sci. Stat. Comput., 13 (1992), pp. 512–530.
 - [839] ———, *Chapter 14: Multigrid and advection*, in Numerical Methods for Advection-Diffusion

- Problems, C. Vreugdenhil and B. Koren, eds., vol. 45 of Notes on Numerical Fluid Mechanics, Vieweg, Braunschweig, 1993, pp. 335–351.
- [840] ———, *Incomplete line LU as smoother and as preconditioner*, in Incomplete Decompositions (ILU) – Algorithms, Theory, and Applications, W. Hackbusch and G. Wittum, eds., vol. 41 of Notes on Numerical Fluid Mechanics, Vieweg, Braunschweig, 1993, pp. 215–224.
- [841] ———, *Development of semi-coarsening techniques*, Appl. Numer. Math., 19 (1996), pp. 433–465.
- [842] P. M. DE ZEEUW AND E. J. VAN ASSELT, *The convergence rate of multi-level algorithms applied to convection-diffusion equations*, SIAM J. Sci. Stat. Comput., 6 (1985), pp. 492–503.
- [843] E. J. DEAN, Q. V. DINH, R. GLOWINSKI, J. HE, T. W. PAND, AND J. PÉRIAUX, *Least squares/domain imbedding methods for Neumann problems: applications to fluid dynamics*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 451–475.
- [844] E. J. DEAN AND R. GLOWINSKI, *Domain decompositions of wave problems using a mixed finite element method*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 326–333.
- [845] F. DEBAE, Y. JIANG, J. M. MARCHAL, AND P. HENRIKSEN, *A parallel version of Polyflow*, in Proceedings of International Conference on High Performance Computing and Networking. HPCN '95 Milan, Italy, May 3–5, 1995, Berlin, 1995, Springer-Verlag, pp. 826–830.
- [846] V. DEBEDA, J. P. CALTAGIRONE, AND P. WATREMEZ, *Local multigrid refinement method for natural convection in fissured porous media*, Numer. Heat Transf. B, Fundam., 28 (1995), pp. 455–467.
- [847] T. DEBONI, J. FEO, G. RODRIGUE, AND J. MULLER, *Implementation and performance of a domain decomposition algorithm in Sisal*, in Proceedings of the Twenty Seventh Hawaii International Conference on System Sciences. Vol.II: Software Technology, 1994, pp. 605–614.
- [848] B. DEBUS, *Ansatz spezieller Mehrgitterkomponenten für ein zweidimensionales, singulär gestörtes Modellproblem: Grobgitter—und Glättungsoperatoren*, PhD thesis, Institut für Angewandte Mathematik, Universität Bonn, 1985.
- [849] K. DECKER, *Gauge-invariant coarse-to-fine transformations for multigrid Monte-Carlo algorithms in pure lattice gauge theories*, Phys. Lett. B, 210 (1988), pp. 207–210.
- [850] ———, *Numerical investigation of a coarse-to-fine transformation for multigrid Monte-Carlo updating*, Comput. Phys. Comm., 54 (1989), pp. 1–11.
- [851] N. H. DECKER, *The Fourier Analysis of Multigrid-Type Iterative Methods*, PhD thesis, University of Wisconsin, Madison, WI, 1987.
- [852] ———, *Note on the parallel efficiency of the frederickson mcbryan multigrid algorithm*, SIAM J. Sci. Stat. Comput., 12 (1991), pp. 208–220.
- [853] N. H. DECKER, J. MANDEL, AND S. V. PARTER, *On the role of regularity in multigrid methods*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 143–156.
- [854] N. H. DECKER AND J. R. ROSENDALE, *Operator induced multigrid algorithms using semirefinement*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 87–105.
- [855] H. DECONINCK, P. W. HEMKER, AND B. KOREN, *New trends in the solution of the Navier-Stokes equations for compressible flows*, in Proceedings of the Aerodays 93, 2nd European Communities Aeronautics RTD Conference, Naples, 1993, H. J. Allgeier, ed., Luxembourg, 1993, Commission of the European Communities, pp. 109–116.
- [856] H. DECONINCK AND C. HIRSCH, *A multigrid finite element method for the transonic potential equation*, in Multigrid Methods, W. Hackbusch and U. Trottenberg, eds., vol. 960 of Lecture Notes in Mathematics, Berlin, 1982, Springer-Verlag, pp. 387–409.
- [857] ———, *A multigrid method for the transonic full potential equation discretized with finite elements on an arbitrary body fitted mesh*, J. Comput. Phys., 48 (1982), pp. 344–365.
- [858] ———, *A multigrid method for the transonic full potential equation discretized with finite elements on an arbitrary body fitted mesh*, in Multigrid Methods, H. Lomax, ed., NASA Conference Publication 2202, Ames Research Center, Moffett Field, CA, 1982, pp. 61–82.
- [859] F. DEFAUX, I. MOCCAGATTA, B. ROUCHOUZE, T. EBRAHIMI, AND M. KUNT, *Motion compen-*

- sated generic coding of video based on a multiresolution data structure, Optical Engng., 32 (1993), pp. 1559–1570.
- [860] A. T. DEGANI AND G. C. FOX, Parallel multigrid computation of the unsteady incompressible Navier Stokes equations, J. Comput. Phys., 128 (1996), pp. 223–236.
- [861] D. DEGANI AND L. B. SCHIFF, Computation of supersonic viscous flows around pointed bodies at large incidence, AIAA, 83–0034 (1983).
- [862] H. DEGERSEM, S. VANDEWALLE, AND K. HAMEYER, A finite-element/equivalent-circuit two-level method for magnetic field simulations, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 73–79.
- [863] J. DEKEYSER AND D. ROOSE, A software tool for load balanced adaptive multiple grids on distributed memory computers, in Proceedings of the Sixth Distributed Memory Computing Conference, Los Alamitos, CA, 1991, IEEE Computer Society Press, pp. 122–128.
- [864] ———, Incremental mapping for solution-adaptive multigrid hierarchies, in Proceedings of the Scalable High Performance Computing Conference '92, Los Alamitos, CA, 1992, IEEE Computer Society Press, pp. 401–408.
- [865] ———, Multigrid with solution-adaptive irregular grids on distributed memory computers, in Parallel Computing '91, Elsevier Science Publishers B. V., Amsterdam, 1992, pp. 375–382.
- [866] ———, Parallel steady Euler calculations using multigrid methods and adaptive irregular meshes, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 163–174.
- [867] ———, Parallel steady Euler calculations using multigrid methods and adaptive irregular meshes, in Adaptive Methods – Algorithms, Theory and Applications, vol. 46 of Notes on Numerical Fluid Mechanics, Braunschweig, 1994, Vieweg, pp. 187–198.
- [868] ———, Run-time load balancing techniques for a parallel unstructured multi-grid Euler solver with adaptive grid refinement, Parallel Comput., 21 (1995), pp. 179–198.
- [869] J. M. DELERY, Investigation of strong shock turbulent boundary layer interaction in 2D flows with emphasis on turbulence phenomena, AIAA, 81–1245 (1981).
- [870] F. DELLAGIACOMA, S. PAOLETTI, F. POGGI, AND M. VITALETTI, A domain decomposition environment for local time dependent problems, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 361–366.
- [871] F. DELLAGIACOMA, M. VITALETTI, A. JAMESON, L. MARTINELLI, S. SIBILLA, AND L. VISINTINI, *FLO67P: a multi-block version of FLO67 running within PARAGRID*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North-Holland), Amsterdam, 1995, pp. 199–206.
- [872] L. M. DELVES AND C. A. HALL, An implicit matching procedure for global element calculations, J. Ints. Math. Appl., 23 (1979), p. 223.
- [873] G. P. DEMETRE AND S. M. FAROUQ ALI, Review of analytical well models used in reservoir simulation, SPE of AIME, SPE28179 (1994), pp. 1–9.
- [874] L. DEMKOWICZ, J. T. ODEN, W. RACHOWICZ, AND O. HARDY, Toward a univeral hp adaptive finite element strategy, part 1. Constrained approximation and data structure, Comput. Meth. Appl. Mech. Engrg., 77 (1989), pp. 79–112.
- [875] A. O. DEMUREN, Application of multi-grid methods for solving the Navier–Stokes equations, Proc. Inst. Mech. Engrs., 203 (1989), pp. 255–265.
- [876] ———, Characteristics of three-dimensional turbulent jets in crossflow, Int. J. Engng. Sci., 31 (1993), pp. 899–913.
- [877] A. O. DEMUREN AND S. O. IBRAHEEM, On the stability analysis of approximate factorization methods for 3-D Euler and Navier Stokes equations, Numer. Heat Transf. B, Fundam., 25 (1994), pp. 97–117.
- [878] J. E. DENDY, Local grid refinement in the multigrid method, Trans. A.N.S., 38 (1981), pp. 342–343.
- [879] ———, Black box multigrid, J. Comput. Phys., 48 (1982), pp. 366–386.
- [880] ———, Black box multigrid for nonsymmetric problems, Appl. Math. Comput., 13 (1982), pp. 261–284.
- [881] ———, Multigrid semi-implicit hydrodynamics revisited, in Proc. Conference on Large Scale Scientific Computation, Madison, WI, 1983.
- [882] ———, A priori local grid refinement in the multigrid method, in Elliptic Problem Solvers II, G. Birkhoff and A. Schoenstadt, eds., Academic Press, New York, 1984, pp. 439–451.

- [883] ———, *Black box multigrid for systems*, Appl. Math. Comput., 19 (1986), pp. 57–74.
- [884] ———, *Two multigrid methods for three-dimensional equations with highly discontinuous coefficients*, SIAM J. Sci. Stat. Comput., 8 (1987), pp. 673–685.
- [885] ———, *Black box multigrid for periodic and singular problems*, Appl. Math. Comput., 25 (1988), pp. 1–10.
- [886] ———, *Multigrid methods for diffusion equations with highly discontinuous coefficients*, Trans. A.N.S., 56 (1988), p. 290.
- [887] ———, *Multigrid methods for petroleum reservoir simulation on SIMD machines*, in Proc. Twelfth SPE Symposium on Reservoir Simulation, SPE, 1993.
- [888] ———, *Multigrid methods for petroleum reservoir simulation on SIMD machines*, in Proceedings of the SPE Symposium on Reservoir Simulation, Richardson, TX, 1993, Soc of Petroleum Engineers of AIME, pp. 97–104.
- [889] ———, *Revenge of the semicoarsening frequency decomposition multigrid method*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 227–239.
- [890] ———, *Semicoarsening multigrid for systems*, Elect. Trans. Numer. Anal., 6 (1997), pp. 97–105.
- [891] J. E. DENDY AND J. M. HYMAN, *Multi-grid and ICCG for problems with interfaces*, in Elliptic Problem Solvers, M. H. Schultz, ed., Academic Press, New York, 1981, pp. 247–253.
- [892] J. E. DENDY, M. P. IDA, AND J. M. RUTLEDGE, *A semicoarsening multigrid algorithm for SIMD machines*, SIAM J. Sci. Stat. Comput., 13 (1992), pp. 1460–1469.
- [893] J. E. DENDY, S. F. MCCORMICK, J. W. RUGE, T. F. RUSSELL, AND S. SCHAFER, *Multigrid methods for three-dimensional petroleum reservoir simulation*, in Proc. Tenth SPE Symposium on Reservoir Simulation, SPE, 1989.
- [894] J. E. DENDY AND C. C. TAZARTES, *Grandchild of the frequency decomposition multigrid method*, SIAM J. Sci. Comput., 16 (1995), pp. 307–319.
- [895] J. E. DENDY AND H. TCHELEPI, *Multigrid applied to implicit well problems*, in 5th European Multigrid Conference Special Topics and Applications, University of Stuttgart, Stuttgart, 1998, pp. 18–34.
- [896] Q. DENG, *An optimal order nonnested mixed multigrid method for generalized Stokes problems*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 241–253.
- [897] V. V. DENISENKO AND S. S. ZAMAY, *Electric field in the equatorial ionosphere*, Planet. Space Sci., 40 (1992), pp. 941–952.
- [898] V. V. DENISSENKO, *The multilevel iteration method for 2-D problems, that simulate transfer processes with assymetric coefficients matrix*, in AMLI'96: Proceedings of the Conference on Algebraic Multilevel Iteration Methods with Applications, vol. 1, Nijmegen, The Netherlands, 1996, University of Nijmegen, pp. 117–125.
- [899] ———, *The multigrid method for symmetrized boundary value problems of diffusion in moving medium*, in 5th European Multigrid Conference Special Topics and Applications, University of Stuttgart, Stuttgart, 1998, pp. 35–46.
- [900] J. D. DENTON, *An improved time marching method for turbomachinery flow calculation*, in Numerical Methods in Aeronautical Fluid Dynamics, P. L. Roe, ed., London, 1982, Academic Press, pp. 189–210.
- [901] A. A. DERKACH AND V. A. SÁNKO, *Electron distribution by energies in a charge with evaporating hollow cathode*, Teplofiz Vys. Temp., 29 (1991), pp. 840–846.
- [902] A. DERVIEUX, L. FEZOUI, AND A. GOUDJO, *Multi-level parallel algorithms for solving the Euler equations*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 1, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 187–193.
- [903] ———, *Multilevel algorithms for solving the Euler equations*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 106–116.
- [904] A. DERVIEUX, L. FEZOUI, H. STEVE, J. PÉRIAUX, AND B. STOUFFLET, *Low-storage implicit upwind-FEM schemes for the Euler equations*, in Proceedings of the 11th International Conference on Numerical Methods in Fluid Dynamics, D. L. Dwyer, M. Y. Jussaini, and R. G. Voigt, eds., vol. 323 of Lecture Notes in Physics, New York, 1989, Springer-Verlag, pp. 215–219.

- [905] B. DESPRES, *Domain decomposition method and the Helmholtz problems*, in Mathematical and Numerical Aspects of Wave Propagation Phenomena, G. Cohen, L. Halpern, and P. Joly, eds., SIAM, Philadelphia, 1991, pp. 44–52.
- [906] F. DESPREZ AND M. GARBEY, *Numerical simulation of a combustion problem on a Paragon machine*, Parallel Comput., 21 (1995), pp. 495–508.
- [907] P. DESTUYNDER AND F.-X. ROUX, *A parallel solver for the linear elasticity equations on a composite beam*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 314–320.
- [908] P. DEUFLHARD, *Cascadic conjugate gradient methods for elliptic partial differential equations: algorithm and numerical results*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 29–42.
- [909] P. DEUFLHARD, P. LEINEN, AND H. YSERENTANT, *Concepts of an adaptive hierarchical finite element code*, Impact Comput. Sci. Eng., 1 (1989), pp. 3–35.
- [910] P. DEUFLHARD AND M. WEISER, *Local inexact newton multilevel fem for nonlinear elliptic problems*, in Computational Science for the 21st Century, New York, 1997, John Wiley & Sons, pp. 129–138.
- [911] ———, *Global inexact Newton multilevel FEM for nonlinear elliptic equations*, in Multigrid Methods V, vol. 3 of Lecture Notes in Computational Science and Engineering, Berlin, 1998, Springer, pp. 71–89.
- [912] M. O. DEVILLE AND E. H. MUND, *Chebyshev pseudospectral solution of second order elliptic equations with finite element preconditioning*, J. Comput. Phys., 60 (1985), p. 517.
- [913] D. DEWEY AND A. T. PATERA, *Geometry-definig processors for partial differential equations*, in Architectures and Performance of Specialized Computer Systems, B. J. Alder, ed., Academic Press, New York, 1988.
- [914] J. C. DIAZ, R. E. EWING, A. E. McDONALD, L. M. UHLER, AND D. V. VAN ROSENBERG, *Self-adaptive local grid refinement for time-dependent, two-dimensional simulation*, in Finite Elements in Fluids, vol. VI, John Wiley & Sons, New York, 1985, pp. 279–290.
- [915] J. C. DIAZ, M. KOMARA, AND J. HENSLEY, *Incomplete domain decomposition LUF actorizations*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 80–87.
- [916] E. DICK, *A multigrid method for Cauchy–Riemann and steady Euler equations based on flux-difference splitting*, in Efficient Solution of Elliptic Systems, W. Hackbusch, ed., vol. 10 of Notes on Numerical Fluid Mechanics, Braunschweig, 1984, Vieweg, pp. 20–37.
- [917] ———, *A multigrid method for the cauchy–riemann equations based on flux-difference splitting and its extension to the steady euler equations*, J. Comp. Appl. Math., 12 and 13 (1985), pp. 247–263.
- [918] ———, *A multigrid technique for steady Euler equations based on flux-difference splitting*, in Proceedings of the Ninth International Conference on Numerical Methods in Fluid Dynamics, Soubbaramayer and J. P. Boujot, eds., vol. 218 of Lecture Notes in Physics, Berlin, 1985, Springer–Verlag.
- [919] ———, *A flux-difference splitting method for steady Euler equations*, J. Comput. Phys., 76 (1988), pp. 19–32.
- [920] ———, *A multigrid method for steady incompressible Navier–Stokes equations based on flux-vector splitting*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 157–165.
- [921] ———, *A multigrid flux-difference splitting method for steady Euler equations*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 117–129.
- [922] ———, *A multigrid flux-difference splitting method for steady Euler equations*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 2, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 1–13.
- [923] ———, *A multigrid method for steady Euler equations based on polynomial flux-difference splitting*, in Proceedings of the 11th International Conference on Numerical Methods in Fluid Dynamics, D. L. Dwyer, M. Y. Jussaini, and R. G. Voigt, eds., vol. 323 of Lecture Notes in Physics, New York, 1989, Springer–Verlag, pp. 225–229.
- [924] ———, *A multigrid method for steady incompressible Navier– Stokes equations based on partial flux splitting*, Int. J. Numer. Meth. Fluids, 9 (1989), pp. 113–120.

- [925] ———, *A multigrid method for the steady Euler equations, based on flux-difference splitting with respect to primitive variables*, in Robust Multi-Grid Methods, W. Hackbusch, ed., vol. 23 of Notes on Numerical Fluid Mechanics, Braunschweig, 1989, Vieweg, pp. 69–85.
- [926] ———, *Multigrid formulation of polynomial flux-difference splitting for steady Euler equations*, J. Comput. Phys., 91 (1990), pp. 161–173.
- [927] ———, *Multigrid solution of steady Euler equations based on polynomial flux-difference splitting*, Int. J. Numer. Meth. Heat Fluid Flow, 1 (1991), pp. 51–62.
- [928] ———, *Second order formulation of a multigrid method for steady Euler equations through defect correction*, J. Comput. Appl. Math., 35 (1991), pp. 159–168.
- [929] E. DICK AND J. LINDEN, *A multigrid method for steady incompressible Navier Stokes equations based on flux difference splitting*, Int. J. Numer. Meth. Fluids, 14 (1992), pp. 1311–1323.
- [930] E. DICK AND K. RIEMSLAGH, *Multi staging of Jacobi relaxation to improve smoothing properties of multigrid methods for steady Euler equations*, J. Comput. Appl. Math., 50 (1994), pp. 241–254.
- [931] ———, *Multigrid methods for steady Euler equations based on multi-stage Jacobi relaxation*, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 175–187.
- [932] E. DICK, K. RIEMSLAGH, AND J. VIERENDEELS, *Multigrid Methods VI*, vol. 14 of Lecture Notes in Computational Science and Engineering, Springer-Verlag, Berlin, 2000.
- [933] A. DICKINSON, P. BURTON, J. PARKER, AND R. BAXTER, *Implementation and initial results from a parallel version of the meteorological office atmosphere prediction model*, in Proceedings of the Sixth ECMWF Workshop on the Use of Parallel Processors in Meteorology, Reading, UK, Nov. 21–25, 1994, Singapore, 1995, World Scientific, pp. 177–194.
- [934] L. DIECI AND G. BADER, *Solution of the systems associated with invariant tori approximation. II. Multigrid methods*, SIAM J. Sci. Comput., 15 (1994), pp. 1375–1400.
- [935] W. E. DIETZ, J. L. JACOCKS, AND J. H. FOX, *Application of domain decomposition to the analysis of complex aerodynamic configurations*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1990, SIAM, pp. 428–450.
- [936] K. P. DIMITRIADIS AND M. A. LESCHZINER, *Multilevel convergence acceleration for viscous and turbulent transonic flows computed with a cell–vertex method*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 130–148.
- [937] ———, *Multilevel convergence acceleration for viscous and turbulent transonic flows computed with cell–vertex method*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 2, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 15–29.
- [938] N. DINAR, *Fast Methods for the Numerical Solution of Boundary Value Problems*, PhD thesis, Weizmann Institute of Science, Rehovot, Isreal, 1979.
- [939] Q. V. DINH, *Simulation numérique en éléments finis d’écoulements de fluides visqueux incompressibles par une méthode de décomposition de domaines sur processeurs vectoriels*, PhD thesis, Univ. P. et M. Curie, Paris, 1982.
- [940] Q. V. DINH AND T. FANION, *Applications of dual Schur complement preconditioning to problems in computational fluid dynamics and computational electro-magnetics*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 708–718.
- [941] Q. V. DINH, A. FISCHLER, R. GLOWINSKI, AND J. PÉRIAUX, *Domain decomposition methods for the Stokes problem. Application to the Navier–Stokes equations*, in Numera, vol. 85, Swansea, 1985.
- [942] Q. V. DINH, R. GLOWINSKI, J. HE, V. KWOCK, T. W. PAN, AND J. PÉRIAUX, *Lagrange multiplier approach to fictitious domain methods: application to fluid dynamics and electro-magnetics*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 151–194.
- [943] Q. V. DINH, R. GLOWINSKI, B. MANTEL, J. PÉRIAUX, AND P. PERRIER, *Subdomain solutions of nonlinear problems in fluid dynamics on parallel processors*, in 5th International Symposium on Computational Methods in Applied Sciences and Engineering, Versailles, Amsterdam, 1981, North–Holland.
- [944] Q. V. DINH, R. GLOWINSKI, AND J. PÉRIAUX, *Application of domain decomposition technique*

- to the numerical solution of the Navier–Stokes equations*, Numer. Meth. for Engng., 1 (1980), pp. 383–404.
- [945] ———, *Solving problems by decomposition methods with applications*, in Elliptic Problem Solvers II, G. Birkhoff and A. Schoenstadt, eds., Academic Press, New York, 1982, pp. 395–426.
- [946] ———, *Domain decomposition methods for nonlinear problems in fluid dynamics*, Comp. Meth. Appl. Mech. Engng., 40 (1983), pp. 27–109.
- [947] ———, *Solving elliptic problems by domain decomposition methods with applications*, in Elliptic Problem Solvers II, G. Birkhoff and A. Schoenstadt, eds., Academic Press, 1984.
- [948] Q. V. DINH, R. GLOWINSKI, J. PÉRIAUX, AND G. TERRASSON, *On the coupling of viscous and inviscid models for incompressible fluid flows via domain decomposition*, in First International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. Péraux, eds., Philadelphia, 1988, SIAM, pp. 350–369.
- [949] Q. V. DINH, J. PÉRIAUX, G. TERRASSON, AND R. GLOWINSKI, *On the coupling of incompressible viscous flows and incompressible potential flows via domain decomposition*, in International Conference on Numerical Methods for Fluid Dynamics, Beijing, 1986.
- [950] B. DISKIN, *Multigrid algorithm with conditional coarsening for the non-aligned sonic flow*, Elect. Trans. Numer. Anal., 6 (1997), pp. 106–119.
- [951] G. S. DJAMBAZOV, C.-H. LAI, AND K. A. PERICLEOUS, *Development of a domain decomposition method for computational aeroacoustics*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 719–725.
- [952] M. E. DMITRENKO AND L. A. OGANESIAN, *Version of the Schwarz method for adjacent grid domains*, in Computations with Sparse Matrices, Novosibirsk, 1981, pp. 36–44.
- [953] M. DOBROWOLSKI, *Mixed finite element method for approximating incompressible materials*, SIAM J. Numer. Anal., 29 (1992), pp. 365–389.
- [954] M. DOBROWOLSKI, S. GRAF, AND C. PFLAUM, *On a posteriori error estimators in the finite element method on anisotropic meshes*, Elect. Trans. Numer. Anal., 8 (1998), pp. 36–45.
- [955] I. DOLTSINIS AND S. NOLTING, *Generation and decomposition of finite element models for parallel computations*, Comput. Syst. Eng., 2 (1991), pp. 427–449.
- [956] D. G. DOMMERMUTH, *Efficient simulation of short and long wave interactions with applications to capillary waves*, Trans. ASME, J. Fluids Eng., 116 (1994), pp. 77–82.
- [957] J. M. DONATO, *Iterative methods for scalar and coupled systems of elliptic equations*, PhD thesis, Department of Mathematics, UCLA, Los Angeles, CA, 1991.
- [958] J. J. DONGARRA, J. R. BUNCH, C. B. MOLER, AND G. W. STEWART, *LINPACK User's Guide*, SIAM, Philadelphia, 1979.
- [959] J. J. DONGARRA, J. D. CROZ, I. S. DUFF, AND S. HAMMARLING, *A set of level 3 basic linear algebra subprograms*, ACM Trans. Math. Soft., X (1990).
- [960] T. F. DONIERE AND A. P. DHAWAN, *A transition criterion for the multigrid expectation maximization reconstruction algorithm for positron emission tomography*, in Proceedings of the 16th Annual International Conference of the IEEE Engineering in Medicine and Biology Society. Engineering Advances: New Opportunities for Biomedical Engineers, New York, 1994, IEEE, pp. 630–631.
- [961] M. DONOVANG, *Defektkorrekturen nach Stetter und Pereyra und MG-Extrapolation nach Brandt: Beziehungen und Anwendung auf elliptische Randwertaufgaben*, PhD thesis, Institut für Angewandte Mathematik, Universität Bonn, 1981.
- [962] J. H. DÖRFER, *Treatment of singular perturbation problems with multigrid methods*, in Robust Multi-Grid Methods, W. Hackbusch, ed., vol. 23 of Notes on Numerical Fluid Mechanics, Braunschweig, 1989, Vieweg, pp. 86–95.
- [963] W. DÖRFLER, *A robust adaptive strategy for the non-linear Poisson equation*, Computing, 55 (1995), pp. 289–304.
- [964] M. DORMANNS AND H. U. HEISS, *Partitioning and mapping of large FEM graphs by self organization*, in Proceedings Euromicro Workshop on Parallel and Distributed Processing, Los Alamitos, CA, 1995, IEEE Comput. Soc. Press, pp. 227–235.
- [965] T. DORNSEIFER AND C. PFLAUM, *Discretization of elliptic differential equations on curvilinear bounded domains with sparse grids*, Computing, 56 (1996), pp. 197–213.
- [966] M. R. DORR, *The approximation theory for the p -version of the finite element method*, SIAM J. Numer. Anal., 21 (1984), pp. 1180–1207.
- [967] ———, *The approximation of solutions of elliptic boundary-value problems via the p -version of the finite element method*, SIAM J. Numer. Anal., 23 (1986), pp. 58–77.
- [968] ———, *On the discretization of interdomain coupling in elliptic boundary-value problems*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Péraux, and O. B.

- Widlund, eds., SIAM, Philadelphia, 1989, pp. 17–37.
- [969] S. E. DORWARD, L. R. MATHESON, AND R. E. TARJAN, *Unstructured multigrid strategies on massively parallel computers: a case for integrated design*, in Proceedings of the Twenty Seventh Hawaii International Conference on System Sciences. Vol.II: Software Technology, 1994, pp. 169–178.
- [970] Z. DOSTÁL, *Projector preconditioning and domain decomposition methods*, Appl. Math. Comput., 37 (1990), pp. 75–81.
- [971] ———, *Domain decomposition and PDE with periodic boundary conditions*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 258–261.
- [972] Z. DOSTÁL, *The Schur complement algorithm for the solution of contact problems*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 441–446.
- [973] C. C. DOUGLAS, *A multilevel solver for boundary value problems*. appeared in a special joint issue on numerical simulation of VLSI devices of *IEEE Trans. on Electrons*, 32 (1985), pp. 1987–1991, and *IEEE Trans. on Comp. Aided Design*, 4 (1985), pp. 431–435.
- [974] ———, *Multi-grid algorithms for elliptic boundary-value problems*, PhD thesis, Yale University, May 1982.
- [975] ———, *Abstract multi-grid with applications to elliptic boundary-value problems*, in Elliptic Problem Solvers II, G. Birkhoff and A. Schoenstadt, eds., Academic Press, New York, 1984, pp. 453–466.
- [976] ———, *Multi-grid algorithms with applications to elliptic boundary-value problems*, SIAM J. Numer. Anal., 21 (1984), pp. 236–254.
- [977] ———, *A multigrid optimal order solver for elliptic boundary value problems: the finite difference case*, in Advances in Computer Methods for Partial Differential Equations – V, R. Vichnevetsky and R. S. Stepleman, eds., New Brunswick, NJ, 1984, IMACS, pp. 369–374.
- [978] ———, *The domain reduction method in three dimensions*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 2, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 31–35.
- [979] ———, *A variation of the Schwarz alternating method: the domain decomposition reduction method*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1990, pp. 191–201.
- [980] ———, *A tupleware approach to domain decomposition methods*, Appl. Numer. Math., 8 (1991), pp. 353–373.
- [981] ———, *The effect of interpolation on the rate of convergence in two level algorithms for elliptic partial differential equations*, in Preliminary version of the Proceedings of the Copper Mountain Conference on Iterative Methods, T. Manteuffel, ed., Computational Mathematics Group, University of Colorado at Denver, Denver, Colorado, 1992.
- [982] ———, *MGNet: a multigrid and domain decomposition network*, ACM SIGNUM Newsletter, 27 (1992), pp. 2–8.
- [983] ———, *Parallel multilevel and multigrid methods*, SIAM News, 25 (1992), pp. 14–15.
- [984] ———, *Implementing abstract multigrid or multilevel methods*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 127–141.
- [985] ———, *A generalized multigrid theory in the style of standard iterative methods*, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 19–34.
- [986] ———, *Some remarks on completely vectorizing point Gauss-Seidel while using the natural ordering*, Advances Comput. Math., 2 (1994), pp. 215–222.
- [987] ———, *Madpack: A family of abstract multigrid or multilevel solvers*, Comput. Appl. Math., 14 (1995), pp. 3–20.
- [988] ———, *Caching in with multigrid algorithms: problems in two dimensions*, Paral. Alg. Appl., 9 (1996), pp. 195–204.
- [989] ———, *A review of numerous parallel multigrid methods*, in Applications on Advanced Architecture Computers, G. Astfalk, ed., SIAM, Philadelphia, 1996, pp. 187–202.
- [990] ———, *A sparse matrix approach to abstract multilevel solvers on serial and parallel computers*, ZAMM, 76 (1996), pp. 139–142.

- [991] ———, *Multigrid methods in science and engineering*, IEEE Comput. Sci. Eng., 3 (1997), pp. 55–68.
- [992] C. C. DOUGLAS AND J. DOUGLAS, *Towards a general convergence theory under few assumptions for abstract multilevel algorithms*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 1, Denver, 1991, University of Colorado, pp. 197–218.
- [993] ———, *A greatly simplified theory for parallel multigrid or projection methods*, in Proceedings of the Fifth SIAM Conference on Parallel Processing for Scientific Computing, D. Sorensen, J. J. Dongarra, K. Kennedy, P. Messina, and R. Voigt, eds., SIAM, Philadelphia, 1992, pp. 105–110.
- [994] ———, *A unified convergence theory for abstract multigrid or multilevel algorithms, serial and parallel*, SIAM J. Numer. Anal., 30 (1993), pp. 136–158.
- [995] C. C. DOUGLAS, J. DOUGLAS, AND D. E. FYFE, *A multigrid unified theory for non-nested grids and/or quadrature*, E. W. J. Numer. Math., 2 (1994), pp. 285–294.
- [996] ———, *A note on multigrid theory for non-nested grids and/or quadrature*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 255–264.
- [997] C. C. DOUGLAS AND M. B. DOUGLAS, *MGNet Bibliography*. Department of Computer Science and the Center for Computational Sciences, University of Kentucky, Lexington, KY, USA and Department of Computer Science, Yale University, New Haven, CT, USA, 1991–2002 (last modified on September 28, 2002); see <http://www.mgnet.org/mgnet-bib.html>.
- [998] C. C. DOUGLAS AND A. ERN, *Numerical solution of flame sheet problems with and without multigrid methods*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 143–157.
- [999] C. C. DOUGLAS, A. ERN, AND M. D. SMOOKE, *Numerical simulation of laminar diffusion flames*, SIAM News, 27 (1994), pp. 1, 12–13, 17.
- [1000] ———, *High performance computing and numerical simulation of flames*, ZAMM, 76 (1996), pp. 49–52.
- [1001] ———, *Numerical simulation of laminar diffusion flames*, in Applications on Advanced Architecture Computers, G. Astfalk, ed., SIAM, Philadelphia, 1996, pp. 243–254.
- [1002] ———, *Multigrid solution of flame sheet problems on serial and parallel computers*, Paral. Alg. Appl., 10 (1997), pp. 225–236.
- [1003] C. C. DOUGLAS, G. HAASE, J. HU, M. KOWARSCHIK, U. RÜDE, AND C. WEISS, *Portable memory hierarchy techniques for pde solvers, part i*, SIAM News, 33 (2000), pp. 1, 8–9.
- [1004] ———, *Portable memory hierarchy techniques for pde solvers, part ii*, SIAM News, 33 (2000), pp. 1, 10–11, 16.
- [1005] C. C. DOUGLAS, J. HU, AND M. ISKANDARANI, *Preprocessing costs of cache based multigrid*, in Proceeding of ENUMATH99: Third European Conference on Numerical Methods for Advanced Applications, Singapore, 2000, World Scientific, pp. 362–370.
- [1006] C. C. DOUGLAS, J. HU, M. ISKANDARANI, M. KOWARSCHIK, U. RÜDE, AND C. WEISS, *Maximizing cache memory usage for multigrid algorithms*, in Multiphase Flows and Transport in Porous Media: State of the Art, Springer, Berlin, 2000, pp. 124–137.
- [1007] C. C. DOUGLAS, J. HU, W. KARL, M. KOWARSCHIK, U. RÜDE, AND C. WEISS, *Fixed and adaptive cache aware algorithms for multigrid methods*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 87–93.
- [1008] C. C. DOUGLAS, J. HU, M. KOWARSCHIK, U. RÜDE, AND C. WEISS, *Cache optimization for structured and unstructured grid multigrid*, Elect. Trans. Numer. Anal., 10 (2000), pp. 21–40.
- [1009] C. C. DOUGLAS, J. HU, J. RAY, D. T. THORNE, AND R. S. TUMINARO, *Fast, adaptively refined computational elements in 3D*, in Computational Science – ICCS 2002, vol. 3, Springer-Verlag, Berlin, 2002, pp. 774–783.
- [1010] C. C. DOUGLAS, S. C. MA, AND W. L. MIRANKER, *Generating parallel algorithms through multigrid and aggregation/disaggregation techniques*, in Computational Acoustics: Algorithms and Applications, D. Lee, R. L. Sternberg, and M. H. Schultz, eds., Elsevier, North-Holland, New York, 1987, pp. 133–147.
- [1011] C. C. DOUGLAS, S. MALHOTRA, AND M. H. SCHULTZ, *A characterization of mapping unstructured grids onto structured grids and using multigrid as a preconditioner*, BIT, 37 (1997), pp. 661–677.

- [1012] ———, *Parallel multigrid with ADI-like smoothers in two dimensions*, in 5th European Multigrid Conference Special Topics and Applications, University of Stuttgart, Stuttgart, 1998, pp. 47–57.
- [1013] C. C. DOUGLAS AND J. MANDEL, *The domain reduction method: high way reduction in three dimensions and convergence with inexact solvers*, in Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., SIAM, Philadelphia, 1989, pp. 149–160.
- [1014] ———, *A group theoretic approach to the domain reduction method*, Computing, 48 (1992), pp. 73–96.
- [1015] C. C. DOUGLAS, J. MANDEL, AND W. L. MIRANKER, *Fast hybrid solution of algebraic systems*, SIAM J. Sci. Stat. Comput., 11 (1990), pp. 1073–1086.
- [1016] C. C. DOUGLAS AND W. L. MIRANKER, *Constructive interference in parallel algorithms*, SIAM J. Numer. Anal., 25 (1988), pp. 376–398.
- [1017] ———, *Some non telescoping parallel algorithms based on serial multigrid/aggregation/disaggregation techniques*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 167–176.
- [1018] C. C. DOUGLAS AND B. F. SMITH, *Using symmetries and antisymmetries to analyze a parallel multigrid algorithm*, SIAM J. Numer. Anal., 26 (1989), pp. 1439–1461.
- [1019] J. DOUGLAS, R. E. EWING, AND M. F. WHEELER, *The approximation of the pressure by a mixed method in the simulation of miscible displacement*, RAIRO Anal. Numer., 17 (1983), pp. 17–33.
- [1020] J. DOUGLAS, F. FURTADO, AND F. PEREIRA, *Parallel methods for immiscible displacement in porous media*, Wuhan U. J. Nat. Sci., 1 (1996), pp. 502–507.
- [1021] J. DOUGLAS AND C.-S. HUANG, *An accelerated domain decomposition procedure based on Robin transmission conditions*, BIT, 37 (1997), pp. 678–686.
- [1022] J. DOUGLAS AND D. B. MEADE, *Second-order transmission conditions for the Helmholtz equation*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 434–440.
- [1023] J. B. DRAKE, R. E. FLANERY, D. W. WALKER, P. M. WORLEY, I. T. FOSTER, J. G. MICHALAKES, R. L. STEVENS, J. J. HACK, AND D. L. WILLIAMSON, *The message passing version of the parallel community climate model*, in Proceedings of the Fifth ECMWF Workshop on the Use of Parallel Processors in Meteorology. Parallel Supercomputing in Atmospheric Science, G. R. Hoffman and T. Kauranne, eds., Singapore, 1993, World Scientific, pp. 500–513.
- [1024] J. B. DRAKE AND L. J. GRAY, *Parallel implementation of the boundary element method*, in Vector and Parallel Computing: issues in applied research and development, Ellis Horwood Ltd. (John Wiley & Sons), Chichester, 1989, pp. 83–92.
- [1025] D. DRIKAKIS, O. ILIEV, AND V. VASSILEVA, *An adaptive-smoothing multigrid method for the Navier–Stokes equations*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer–Verlag, pp. 94–100.
- [1026] D. DRIKAKIS AND E. SCHRECK, *Parallel multi-level calculations for viscous compressible flows*, in CFD Algorithms and Applications for Parallel Processors American Society of Mechanical Engineers, Fluids Engineering Division (Publication) FED, vol. 156, ASME, New York, NY, 1993, pp. 9–23.
- [1027] J. DRKOŠOVÁ, A. GREENBAUM, M. ROZLOŽNIK, AND Z. STRAKOŠ, *Numerical stability of GMRES*, BIT, 35 (1995), pp. 309–330.
- [1028] M. DRYJA, *An algorithm with a capacitance matrix for a variational–difference scheme*, in Variational–Difference Methods in Mathematical Physics, G. I. Marchuk, ed., USSR Academy of Sciences, Novosibirsk, 1981, pp. 63–73.
- [1029] ———, *A capacitance matrix method for Dirichlet problems on polygonal domains*, Numer. Math., 39 (1982), pp. 51–64.
- [1030] ———, *A finite element – capacitance matrix method for the elliptic problem*, SIAM J. Numer. Anal., 20 (1983), pp. 671–680.
- [1031] ———, *Domain decomposition method for solving variational difference systems for elliptic problems*, in Variatsionnonaznostnye metody v matematicheskoi fizike, N. S. Bakhalov and Y. A. Kuznetsov, eds., Otdel Vishislitel'noi Matematiki Akad. Nauk SSSR, Moscow, 1984.
- [1032] ———, *A finite element–capacitance matrix method for elliptic problems in regions partitioned into subregions*, Numer. Math., 44 (1984), pp. 153–168.
- [1033] ———, *A method of domain decomposition for 3-D finite element problems*, in First Interna-

- tional Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. Péliaux, eds., Philadelphia, 1988, SIAM.
- [1034] ———, *A method of domain decomposition for three-dimensional finite element elliptic problems*, in First International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. Péliaux, eds., Philadelphia, 1988, SIAM, pp. 43–61.
- [1035] ———, *An additive Schwarz algorithm for two-and three-dimensional finite element elliptic problems*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Péliaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 168–172.
- [1036] ———, *On the optimality of an additive iterative refinement method*, in Multigrid Methods, J. Mandel, S. McCormick, J. J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM.
- [1037] ———, *Substructuring methods for parabolic problems*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Péliaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 264–271.
- [1038] ———, *Multilevel methods for elliptic problems with discontinuous coefficients in three dimensions*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 43–47.
- [1039] ———, *An additive Schwarz method for elliptic mortar finite element problems in three dimensions*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 88–96.
- [1040] M. DRYJA AND W. HACKBUSCH, *On the nonlinear domain decomposition method*, BIT, 37 (1997), pp. 296–311.
- [1041] M. DRYJA AND W. PROSKUROWSKI, *Fast elliptic solvers on rectangular regions subdivided into strips*, in Advances in Computer Methods for Partial Differential Equations, R. Vichnevetski and R. Stepleman, eds., IMACS, New York, 1984, pp. 360–368.
- [1042] ———, *A capacitance matrix method using strips with alternating Neumann and Dirichlet boundary conditions*, Appl. Numer. Math., 1 (1985), pp. 285–298.
- [1043] M. DRYJA, W. PROSKUROWSKI, AND O. B. WIDLUND, *A method of domain decomposition with cross points for elliptic finite element problems*, in Optimal Algorithm, B. Sendov, ed., Publishing House of the Bulgarian Academy of Sciences, Sofia, 1986, pp. 97–111.
- [1044] ———, *Numerical experiments and implementation of domain decomposition method with cross points*, in Advances in Computer Methods for PDE's-VI, R. Vichnevetsky and R. Stepleman, eds., IMACS, New Brunswick, NJ, 1987, pp. 23–27.
- [1045] M. DRYJA, B. F. SMITH, AND O. B. WIDLUND, *Schwarz analysis of iterative substructuring algorithms for elliptic problems in three dimensions*, SIAM J. Numer. Anal., 31 (1994).
- [1046] M. DRYJA AND O. B. WIDLUND, *On the optimality of an additive iterative refinement method*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 161–170.
- [1047] ———, *Some domain decomposition algorithms for elliptic problems*, in Iterative Methods for Large Linear Systems, New York, 1989, Academic Press, pp. 273–291.
- [1048] ———, *Towards a unified theory of domain decomposition algorithms for elliptic problems*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Péliaux, and O. B. Widlund, eds., Philadelphia, 1990, SIAM, pp. 3–21.
- [1049] ———, *Multilevel additive methods for elliptic finite element problems*, in Parallel Algorithms for Partial Differential Equations, W. Hackbusch, ed., Braunschweig, 1991, Vieweg, pp. 58–69.
- [1050] ———, *Additive Schwarz methods for elliptic finite element problems in three dimensions*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 3–18.
- [1051] ———, *Domain decomposition algorithms with small overlap*, SIAM J. Sci. Comput., 15 (1994), pp. 604–620.
- [1052] ———, *Some recent results on Schwarz type domain decomposition algorithms*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode

- Island, 1994, American Mathematical Society, pp. 53–61.
- [1053] P. F. DUBOIS, A. GREENBAUM, AND G. H. RODRIGUE, *Approximating the inverse of a matrix for use in iterative algorithms on vector processors*, Computing, 22 (1977), pp. 257–268.
- [1054] A. A. DUBRULLE, *Retooling the method of block conjugate gradients*, Elect. Trans. Numer. Anal., 12 (2001), pp. 216–233.
- [1055] F. DUFAUX AND M. KUNT, *Multigrid block matching motion estimation with an adaptive local mesh refinement*, in Proceedings of the SPIE, vol. 1818, The International Society for Optical Engineering, 1992, pp. 97–109.
- [1056] I. S. DUFF, *Sparse matrix software for elliptic PDE's*, in Multigrid Methods, W. Hackbusch and U. Trottenberg, eds., vol. 960 of Lecture Notes in Mathematics, Berlin, 1982, Springer-Verlag, pp. 410–426.
- [1057] A. P. DUFFY, J. L. H. T. M. BENSON, AND C. CHRISTOPOULOS, *The application of the transmission line modelling (TLM) method to the simulation of propagation and coupling inside conducting enclosures*, Electromag. Compat., P83M2 (1993), pp. 445–449.
- [1058] J. C. DUFOURD AND J. F. NAVINER, *An optimizable model for process independent symbolic design*, in Proceedings. The European Design and Test Conference. EDAC, The European Conference on Design Automation. ETC European Test Conference. EUROASIC, The European Event in ASIC Design, 1994, p. 660.
- [1059] J. K. DUKOWICZ, *A simplified adaptive mesh technique derived from the moving finite element method*, J. Comput. Phys., 56 (1984), pp. 324–342.
- [1060] C. DUNCAN AND J. JONES, *A mixed method Poisson solver for three-dimensional self-gravitation astrophysical fluid dynamical systems*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 159–173.
- [1061] T. F. DUPONT, R. P. KENDALL, AND H. H. RACHFORD, *An approximate factorization procedure for solving self-adjoint elliptic difference equations*, SIAM J. Numer. Anal., 5 (1968), pp. 559–573.
- [1062] A. DUPUY AND J. E. KILLOUGH, *Fully implicit simulation on the connection machine*, in Proceedings of the SPE Symposium on Reservoir Simulation, Richardson, TX, 1993, Soc of Petroleum Engineers of AIME, pp. 459–466.
- [1063] D. DUREISSEIX AND C. FARHAT, *A numerically scalable domain decomposition method for the solution of frictionless contact problems*, Int. J. Numer. Meth. Engng., 50 (2001), pp. 2643–2666.
- [1064] D. DUREISSEIX AND P. LADEVEZE, *A 2-level and mixed domain decomposition approach for structural analysis*, in Proceedings of Domain Decomposition Methods 10, DD10, J. Mandel, C. Farhat, and X.-C. Cai, eds., no. 218 in Contemporary Mathematics, Providence, 1998, AMS, pp. 238–245.
- [1065] ———, *Une approche parallèle et multi-échelles en calcul des structures : exemples et performances*, Rev. Europ. Éléments Finis, 7 (1998), pp. 73–87.
- [1066] F. DURST, L. KADINSKI, AND M. SCHAFER, *A multigrid solver for fluid flow and mass transfer coupled with grey body surface radiation for the numerical simulation of chemical vapor deposition processes*, J. Cryst. Growth, 146 (1995), pp. 202–208.
- [1067] L. C. DUTTO, W. G. HABASHI, M. ROBICHAUD, AND M. FORTIN, *Parallel strategy for the solution of the fully-coupled compressible Navier–Stokes equations*, in Advances in Finite Element Analysis in Fluid Dynamics American Society of Mechanical Engineers, Fluids Engineering Division, M. N. Dhaubhadel, M. S. Engelman, and W. G. Habash, eds., vol. 171, ASME, New York, 1993, pp. 21–31.
- [1068] E. G. D'YAKONOV, *On some modern approaches to constructing spectrally equivalent grid operators*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 35–41.
- [1069] ———, *Effective numerical methods for solving elliptic problems in strengthened Sobolev spaces*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 199–212.
- [1070] ———, *Optimization in Solving Elliptic Problems*, CRC Press, Boca Raton, 1996.
- [1071] J. DYM, *Smoothing constraints for algebraic image restoration*, master's thesis, The Weizmann Institute of Science, Rehovot, Israel, 1986.
- [1072] A. ECER, *Block-structured solution of transonic flows*, in First International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. Périaux, eds., Philadelphia, 1988, SIAM, pp. 417–425.
- [1073] A. ECER, J. HAUSER, P. LECA, AND J. PÉRIAUX, *Parallel Computational Fluid Dynamics*,

- Elsevier Science Publishers B.V. (North–Holland), Amsterdam, 1995.
- [1074] W. ECKHAUS, *Asymptotic Analysis of Singular Perturbations*, North–Holland, Amsterdam, 1979.
- [1075] M. G. EDWARDS AND C. F. ROGERS, *Multigrid and renormalization for reservoir simulation*, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 189–200.
- [1076] R. G. EDWARDS, S. J. FERREIRA, J. GOODMAN, AND A. D. SOKAL, *Multi-grid Monte Carlo III. Two-dimensional $o(4)$ -symmetric nonlinear σ -model*, Nucl. Phys., B380 (1992), pp. 621–664.
- [1077] R. G. EDWARDS, J. GOODMAN, AND A. D. SOKAL, *Multi-grid method for the random-resistor problem*, Phys. Rev. Lett., 61 (1988), pp. 1333–1335.
- [1078] ———, *Algebraic multi-grid method for disordered systems*, Nucl. Phys. B, Proc. Suppl., 9 (1989), pp. 521–524.
- [1079] ———, *Multi-grid Monte Carlo II. Two-dimensional xy model*, Nucl. Phys., B354 (1991), pp. 289–327.
- [1080] V. EIJKHOUT, *A general formulation for incomplete blockwise factorizations*, Comm. Appl. Num. Methods, 4 (1988), pp. 161–164.
- [1081] V. EIJKHOUT AND P. S. VASSILEVSKI, *The role of the strengthened Cauchy–Buniakowskii–Schwarz inequality in multilevel methods*, SIAM Review, 33 (1991), pp. 405–419.
- [1082] M. S. EIKEMO, *On domain decomposition for a three-dimensional extrusion model*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 726–735.
- [1083] M. S. EIKEMO AND M. S. ESPEDAL, *Domain decomposition methods for a three-dimensional extrusion model*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 469–476.
- [1084] S. C. EISENSTAT, *Efficient implementation of a class of preconditioned conjugate gradient methods*, SIAM J. Sci. Stat. Comp., 2 (1981), pp. 1–4.
- [1085] S. C. EISENSTAT, H. C. ELMAN, AND M. H. SCHULTZ, *Variational iterative methods for nonsymmetric systems of linear equations*, SIAM J. Numer. Anal., 20 (1983), pp. 345–357.
- [1086] O. EL-GIAR AND T. HOPKINS, *A generally configurable multigrid implementation for transputer networks*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 2, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 37–46.
- [1087] P. ELIASSEN AND B. ENGQUIST, *The effects of dissipation and coarse grid resolution for multigrid in flow problems*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 265–281.
- [1088] H. C. ELMAN, *Approximate Schur complement preconditioners on serial and parallel computers*, SIAM J. Sci. Stat. Comput., 10 (1989), pp. 581–605.
- [1089] ———, *Multigrid and Krylov subspace methods for the discrete Stokes equations*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 283–299.
- [1090] B. ELTON AND G. RODRIGUE, *Sub-structuring lattice gases*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1990, SIAM, pp. 451–461.
- [1091] R. ENANDER AND E. STERNER, *Analysis of internal boundary conditions and communication strategies for multigrid multiblock methods*, in 5th European Multigrid Conference Special Topics and Applications, University of Stuttgart, Stuttgart, 1998, pp. 58–73.
- [1092] B. ENGQUIST AND E. LUO, *Multigrid methods for differential equations with highly oscillatory coefficients*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 175–189.
- [1093] B. ENGQUIST AND A. MAJDA, *Absorbing boundary conditions for the numerical computation of waves*, Math. Comp., 31 (1977), pp. 629–651.
- [1094] ———, *Radiation boundary conditions for acoustic and elastic wave calculations*, Comm. Pure Appl. Math., 32 (1979), pp. 313–357.
- [1095] W. ENKELMANN, *Investigations of multigrid algorithms for the estimation of optical flow fields in image sequences*, in Workshop on Motion: Representation and Analysis, IEEE

- Computer Society Press, 1986.
- [1096] ———, *Investigations of multigrid algorithms for the estimation of optical flow fields in image sequences*, Comput. Graphics Image Proc., 43 (1988), pp. 150–177.
- [1097] M. J. EPPSTEIN AND D. E. DOUGHERTY, *Comparative study of PVM workstation cluster implementations of a two-phase subsurface flow model*, Advances in Water Resources, 17 (1994), pp. 181–195.
- [1098] B. EPSTEIN, A. L. LUNTZ, AND A. NACHSHON, *Cartesian Euler method for arbitrary aircraft configurations*, AIAA J., 30 (1992), pp. 679–687.
- [1099] B. ERDMANN, R. H. W. HOPPE, AND R. KORNHUBER, *Adaptive multilevel-methods for obstacle problems in three space dimensions*, in Adaptive Methods – Algorithms, Theory and Applications, vol. 46 of Notes on Numerical Fluid Mechanics, Braunschweig, 1994, Vieweg, pp. 120–141.
- [1100] J. ERHEL, *A parallel GMRES version for general sparse matrices*, Elect. Trans. Numer. Anal., 3 (1995), pp. 160–176.
- [1101] G. ERLEBACHER, T. A. ZANG, AND M. Y. HUSSAINI, *Spectral multigrid methods for the solution of homogeneous turbulence problems*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 177–194.
- [1102] A. ERN, *Vorticity-velocity modeling of chemically reacting flows*, PhD thesis, Yale University, New Haven, 1994. Mechanical Engineering Department.
- [1103] A. ERN, C. C. DOUGLAS, AND M. D. SMOKE, *Detailed chemistry modeling of laminar diffusion flames on parallel computers*, Int. J. Supercomput. Appl. High Perf. Comput., 9 (1995), pp. 167–186.
- [1104] O. ERNST AND G. H. GOLUB, *A domain decomposition approach to solving the Helmholtz equation with a radiation boundary condition*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 177–192.
- [1105] B. ERSLAND AND M. S. ESPEDAL, *A domain decomposition method for heterogeneous reservoir flow*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 477–484.
- [1106] ———, *On object oriented programming languages as a tool for a domain decomposition method with local adaptive refinement*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 663–669.
- [1107] B. ERSLAND AND R. TEIGLAND, *Comparison of two cell-centered multigrid schemes for problems with discontinuous coefficients*, Numer. Meth. for PDE, 9 (1993), pp. 265–283.
- [1108] Y. ESCAIG, G. TOUZOT, AND M. VAYSSADE, *Parallelization of a multilevel domain decomposition method*, Comput. Syst. Eng., 5 (1994), pp. 253–263.
- [1109] M. S. ESPEDAL AND R. E. EWING, *Characteristic Petrov-Galerkin subdomain methods for two-phase immiscible flow*, Comp. Meth. Appl. Mech. Engng., 64 (1987), pp. 113–135.
- [1110] M. S. ESPEDAL, X.-C. TAI, AND N. YAN, *A hybrid domain decomposition method for convection-dominated problems*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 230–236.
- [1111] D. ESSEN, G. KUPERS, AND H. MES, *Thermal hydraulic modelling studies on heat exchanging components*, in Research in Numerical Fluid Mechanics, P. Wesseling, ed., vol. 17 of Notes on Numerical Fluid Mechanics, Braunschweig, 1987, Vieweg, pp. 30–44.
- [1112] R. D. F. ET AL, *Hypre: high performance preconditioners*. <http://www.llnl.gov/CASC/hypre>.
- [1113] D. J. EVANS AND L. KANG, *New domain decomposition strategies for elliptic partial differential equations*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 173–191.
- [1114] D. J. EVANS, L. KANG, Y. CHEN, AND J. P. SHAO, *The convergence rate of the Schwarz alternating procedure (IV) – with pseudo boundary relaxation factor*, Int. J. Comput. Math., 21 (1987), pp. 185–203.
- [1115] D. J. EVANS, L. KANG, J. P. SHAO, AND Y. CHEN, *The convergence rate of the Schwarz alternating procedure (I) – for one dimensional problems*, Int. J. Comput. Math., 20 (1986), pp. 157–170.
- [1116] D. J. EVANS AND G.-Y. LEI, *Approximate inverses of multidimensional matrices and application to the block PCG method*, BIT, 35 (1995), pp. 48–63.
- [1117] D. J. EVANS, J. P. SHAO, L. KANG, AND Y. CHEN, *The convergence rate of the Schwarz alternating procedure (II) – for 2 dimensional problems*, Int. J. Comput. Math., 20

- (1986), pp. 325–339.
- [1118] R. E. EWING, *Adaptive mesh refinement in large-scale fluid flow simulation*, in Accuracy estimates and adaptivity for finite elements, John Wiley & Sons, New York, 1986, pp. 299–314.
- [1119] ———, *Efficient adaptive procedures for fluid flow applications*, Comp. Meth. Appl. Mech. Engng., 55 (1986), pp. 89–103.
- [1120] ———, *Adaptive grid-refinement techniques for treating singularities, heterogeneities, and dispersion*, in Numerical Simulation in Oil Recovery, M. F. Wheeler, ed., vol. 11 of IMA, Springer-Verlag, New York, 1988, pp. 133–148.
- [1121] ———, *Domain decomposition techniques for efficient adaptive local grid refinement*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. P閞iaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 192–206.
- [1122] ———, *Large scale computing in reservoir simulation*, in Vector and Parallel Computing: issues in applied research and development, Ellis Horwood Ltd. (John Wiley & Sons), Chichester, 1989, pp. 123–137.
- [1123] R. E. EWING, O. P. ILIEV, S. D. MARGENOV, AND P. S. VASSILEVSKI, *Numerical study of three multilevel preconditioners for solving 2D unsteady Navier-Stokes equations*, Comput. Meth. Appl. Mech. Engrg., 121 (1995), pp. 177–186.
- [1124] R. E. EWING, Y. A. KUZNETSOV, R. LAZAROV, AND S. MALIASSOV, *Preconditioning of nonconforming finite element approximations of second order elliptic problems*, in Proc. of the Third Int. Conf. on Advances in Numerical Methods and Applications, Bulgaria, 1994, pp. 101–110.
- [1125] R. E. EWING, R. D. LAZAROV, T. F. RUSSELL, AND P. S. VASSILEVSKI, *Local refinement via domain decomposition techniques for mixed finite element methods with rectangular Raviart-Thomas elements*, in Domain Decomposition Methods for PDE's, T. F. Chan, R. Glowinski, J. P閞iaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1990, pp. 98–114.
- [1126] R. E. EWING, R. D. LAZAROV, AND P. S. VASSILEVSKI, *Local refinement techniques for elliptic problems on cell-centered grids. I: Error analysis*, Math. Comp., 56 (1991), pp. 437–461.
- [1127] ———, *Mixed finite element solutions of second order elliptic problems on grids with regular local refinement*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. P閏iaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 206–212.
- [1128] R. E. EWING AND S. MALIASSOV, *Preconditioning techniques for mixed and nonconforming finite element methods*, in AMLI'96: Proceedings of the Conference on Algebraic Multilevel Iteration Methods with Applications, vol. 1, Nijmegen, The Netherlands, 1996, University of Nijmegen, pp. 7–22.
- [1129] R. E. EWING, S. MALIASSOV, Y. A. KUZNETSOV, AND R. LAZAROV, *Substructure preconditioning for porous flow problems*, in Finite Element Modeling of Environmental Problems, G. Garey, ed., New York, 1995, John Wiley & Sons, pp. 303–332.
- [1130] R. E. EWING, S. F. MCCORMICK, AND J. W. THOMAS, *The fast adaptive composite grid method for solving differential boundary value problems*, in Proc. Fifth ASCE-EMD Speciality Conference, 1984, pp. 1453–1456.
- [1131] R. E. EWING, T. F. RUSSELL, AND M. F. WHEELER, *Convergence analysis of an approximation of miscible displacement in porous media by mixed finite elements and a modified method of characteristics*, Comp. Meth. Appl. Mech. Engrg., 47 (1984), pp. 73–92.
- [1132] R. E. EWING AND J. SHEN, *A multigrid algorithm for the cell-centered finite difference scheme*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 583–592.
- [1133] R. E. EWING AND P. S. VASSILEVSKI, *Two-level iterative refinement preconditioners*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 262–270.
- [1134] R. E. EWING AND J. WANG, *The Schwarz algorithm and multilevel decomposition iterative techniques for mixed finite element methods*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 48–55.
- [1135] R. E. EWING AND M. F. WHEELER, *Computational aspects of mixed finite element methods*, in Numerical Methods for Scientific Computing, R. S. Stepleman, ed., North-Holland,

- Amsterdam, 1983, pp. 163–172.
- [1136] E. FACCIOLE, A. QUARTERONI, AND A. TAGLIANI, *Spectral multidomain methods for the simulation of wave propagation in heterogeneous media*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 447–455.
- [1137] R. D. FALGOUT AND J. E. JONES, *Multigrid on massively parallel architectures*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 101–107.
- [1138] R. S. FALK AND J. E. OSBORN, *Error estimates for mixed methods*, RAIRO Anal. Numer., 14 (1980), pp. 249–277.
- [1139] M. A. FALLAVOLLITA, J. D. McDONALD, AND D. BAGANOFF, *Parallel implementation of a particle simulation for modeling rarefied gas dynamic flow*, Comput. Syst. Eng., 3 (1992), pp. 283–289.
- [1140] Q. FANG AND T. YAMAMOTO, *Superconvergence of finite difference approximations for convection-diffusion problems*, Numer. Lin. Alg. Appl., 8 (2001), pp. 99–110.
- [1141] S. FARESTAM AND R. B. SIMPSON, *A framework for advancing front techniques of finite element mesh generation*, BIT, 35 (1995).
- [1142] C. FARHAT, *A simple and efficient automatic FEM domain decomposer*, Comput. Struct., 28 (1988), pp. 579–602.
- [1143] ———, *A multigrid-like algorithm for the massively parallel solution of large systems of finite element equations*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 2, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 47–59.
- [1144] ———, *A multigrid-like semi-iterative algorithm for the massively parallel solution of large scale finite element systems*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 171–180.
- [1145] ———, *On the mapping of massively parallel processors onto finite element graphs*, Comput. Struct., 32, no. 2 (1989), pp. 347–353.
- [1146] ———, *A saddle-point principle domain decomposition method for the solution of solid mechanics problems*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 271–292.
- [1147] ———, *Fast structural design and analysis via hybrid domain decomposition on massively parallel processors*, Comput. Syst. Eng., 4 (1993), pp. 453–472.
- [1148] C. FARHAT AND P.-S. CHEN, *Tailoring domain decomposition methods for efficient parallel coarse grid solution and for systems with many right hand sides*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 401–406.
- [1149] C. FARHAT, L. CRIVELLI, AND F.-X. ROUX, *Extending substructure based iterative solvers to multiple load and repeated analyses*, Computer Meth. Appl. Mech. Engng., 117 (1994), pp. 195–209.
- [1150] ———, *Transient FETI methodology for large-scale parallel implicit computations in structural mechanics*, Int. J. Numer. Meth. Engng., 37 (1994), pp. 1945–1975.
- [1151] C. FARHAT, S. LANTERI, AND H. D. SIMON, *TOP/DOMDEC a software tool for mesh partitioning and parallel processing*, Comput. Syst. Eng., 6 (1995), pp. 13–26.
- [1152] C. FARHAT AND M. LESOINNE, *Automatic partitioning of unstructured meshes for the parallel solution of problems in computational mechanics*, J. Numer. Meth. Engrg., 36 (1993), pp. 745–764.
- [1153] ———, *Mesh partitioning algorithms for the parallel solution of partial differential equations*, Appl. Numer. Math., 12 (1993), pp. 443–457.
- [1154] C. FARHAT, M. LESOINNE, AND K. PIERSON, *A scalable dual-primal domain decomposition method*, Numer. Lin. Alg. Appl., 7 (2000), pp. 687–714.
- [1155] C. FARHAT AND J. MANDEL, *Scalable substructuring by lagrange multipliers in theory and practice*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 20–30.
- [1156] C. FARHAT AND D. RIXEN, *A new coarsening operator for the optimal preconditioning of the dual and primal domain decomposition methods: Application to problems with severe coefficient jumps*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339,

- Hampton, VA, 1996, NASA, pp. 301–316.
- [1157] C. FARHAT AND F.-X. ROUX, *A method of finite element tearing and interconnecting and its parallel solution algorithm*, Int. J. Numer. Meth. Engng., 32 (1991), pp. 1205–1227.
 - [1158] ———, *An unconventional domain decomposition method for an efficient parallel solution of large-scale finite element systems*, SIAM J. Sci. Stat. Comput., 13 (1992), pp. 379–396.
 - [1159] ———, *The dual Schur complement method with well-posed local Neumann problems*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 193–201.
 - [1160] ———, *Implicit parallel processing in structural mechanics*, Comput. Mech. Adv., 2 (1994), pp. 1–124.
 - [1161] C. FARHAT AND E. WILSON, *A new finite element concurrent computer program architecture*, Int. J. Numer. Meth. Engng., 24 (1987), pp. 1771–1792.
 - [1162] ———, *A parallel active column equation solver*, Comput. Struct., 28 (1988), pp. 289–304.
 - [1163] P. A. FARRELL, A. RUTTAN, AND R. R. ZELLER, *Application of multigrid methods to the solution of liquid crystal equations on a SIMD computer*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 191–206.
 - [1164] J. FASSBENDER, *Experiences with multigrid-prolongation for two-equation turbulence models in flows with high Reynolds numbers*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 108–114.
 - [1165] J. L. FATTEBERT, *An inverse iteration method using multigrid for quantum chemistry*, BIT, 36 (1996), pp. 509–522.
 - [1166] J.-L. FATTEBERT, *Finite difference schemes and block Rayleigh Quotient Iteration for electronic structure calculations on composite grids*, J. Comput. Phys., 149 (1999), pp. 74–94.
 - [1167] B. FAVINI, R. BROGLIA, AND A. DI MASCIO, *Multigrid acceleration of second order ENO schemes from low subsonic to high supersonic flows*, Int. J. Numer. Methods Fluids, 23 (1996), pp. 589–606.
 - [1168] B. FAVINI AND G. GUJ, *MG techniques for staggered differences*, in Multigrid Methods for Integral and Differential Equations, D. J. Paddon and H. Holstein, eds., The Institute of Mathematics and its Application Conference Series 3, Clarendon Press, Oxford, 1985, pp. 253–262.
 - [1169] R. P. FEDORENKO, *A relaxation method for solving elliptic difference equations*, Z. Vycisl. Mat. i. Mat. Fiz., 1 (1961), pp. 922–927. Also in U.S.S.R. Comput. Math. and Math. Phys., 1 (1962), pp. 1092–1096.
 - [1170] ———, *The speed of convergence of one iterative process*, Z. Vycisl. Mat. i. Mat. Fiz., 4 (1964), pp. 559–563. Also in U.S.S.R. Comput. Math. and Math. Phys., 4 (1964), pp. 227–235.
 - [1171] G. FEN PAW AND D. R. J. OWEN, *Domain decomposition procedures for finite element analysis on transputer based parallel computers*, Comput. Syst. Eng., 2 (1991), pp. 451–460.
 - [1172] X. FENG, *A non-overlapping domain decomposition method for solving elliptic problems by finite element methods*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 222–229.
 - [1173] R. M. FERENCZ, *Element-by-Element Preconditioning Techniques for Large-Scale, Vectorized Finite Element Analysis in Nonlinear Solid and Structural Mechanics*, PhD thesis, Stanford University, Division of Applied Mechanics, Stanford, CA, 1989.
 - [1174] R. C. FERGUSON AND I. G. GRAHAM, *Multilevel adaptive methods for semilinear equations with applications to device modelling*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 745–752.
 - [1175] G. FESSLER, *Überlegungen zu Mehrgitteralgorithmen auf Baumrechnern*, in Rechnerarchitekturen für die numerische Simulation auf der Basis superschneller Lösungsverfahren II, U. Trottenberg and P. Wypior, eds., GMD-Studien Nr. 102, Gesellschaft für Mathematik und Datenverarbeitung, St. Augustin, 1985, pp. 7–14.
 - [1176] D. A. FIELD AND Y. PRESSBURGER, *$h-p$ – multigrid method for finite element analysis*, J. Numer. Meth. Engrg., 36 (1993), pp. 893–908.
 - [1177] M. R. J. FILHO AND N. F. F. EBECKEN, *Structural safety analysis of fixed offshore platforms*, Comput. Syst. Eng., 5 (1994), pp. 369–374.
 - [1178] S. J. FINK AND S. B. BADEN, *Run time data distribution for block structured applications on distributed memory computers*, in Parallel Processing for Scientific Computing, SIAM Proceedings, Philadelphia, 1995, SIAM, pp. 762–767.

- [1179] H. FINNEMANN, J. BREHM, E. MICHEL, AND J. VOLKERT, *Multigrid solution of diffusion equations on distributed memory multiprocessor systems*, Kerntechnik, 52 (1988), pp. 169–174.
- [1180] ———, *Solution of the neutron diffusion equation through multigrid methods implemented on a memory-coupled 25-processor system*, Parallel Comput., 8 (1988), pp. 391–398.
- [1181] S. A. FINOGENOV AND Y. A. KUZNETSOV, *Two-stage fictitious component methods for solving the Dirichlet boundary value problem*, Sov. J. Numer. Anal. Math. Modeling, 3 (1988), pp. 301–323.
- [1182] G. FIORENTINO AND S. SERRA, *Multigrid methods for Toeplitz matrices*, Calcolo, 28 (1991), pp. 283–305.
- [1183] ———, *Multigrid methods for symmetric positive definite block Toeplitz matrices with non-negative generating functions*, SIAM J. Sci. Comput., 17 (1996), pp. 1068–1081.
- [1184] ———, *A τ algebra based multiiterative solver for (block) Toeplitz systems*, in AMLI'96: Proceedings of the Conference on Algebraic Multilevel Iteration Methods with Applications, vol. 1, Nijmegen, The Netherlands, 1996, University of Nijmegen, pp. 129–140.
- [1185] B. FISCHER AND F. PEHERSTORFER, *Chebyshev approximation via polynomial mappings and the convergence behaviour of Krylov subspace methods*, Elect. Trans. Numer. Anal., 12 (2001), pp. 205–215.
- [1186] P. F. FISCHER, *Parallel domain decomposition for incompressible fluid dynamics*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 313–322.
- [1187] P. F. FISCHER, E. M. RØQUIST, D. DEWEY, AND A. T. PATERA, *Spectral element methods: algorithms and architectures*, in First International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. Périaux, eds., Philadelphia, 1988, SIAM, pp. 173–197.
- [1188] A. FISCHLER, *Résolution du problème de Stokes par une méthode de décomposition de domaines. Application à la simulation numérique d'écoulements de Navier–Stokes de fluides incompressibles en éléments finis*, PhD thesis, Univ. P. et M. Curie, Paris, 1985. Thèse de 3e cycle.
- [1189] G. J. FIX AND M. D. GUNZBURGER, *On numerical methods for acoustic problems*, Comput. Math. Appl., 6 (1980), pp. 265–278.
- [1190] C. A. J. FLETCHER AND J. G. BAIN, *Approximate factorisation explicit method for cfd*, Comput. Fluids, 19 (1991), pp. 61–74.
- [1191] J. FLORES, *Simulation of transonic viscous wing and wing-fuselage flows using zonal methods*, in First International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. Périaux, eds., Philadelphia, 1988, SIAM, pp. 381–416.
- [1192] J. FLOWER, S. OTTO, AND M. SALANA, *Optimal mapping of irregular finite element domains to parallel processors*, in Parallel Computers and their Impact on Mechanics, A. K. Noor, ed., vol. AMD vo. 86, The American Society of Mech. Engineers, New York, 1988, pp. 239–250.
- [1193] M. FLÜCK AND R. HERBIN, *Implementation of a parallel domain decomposition – multigrid method for structured finite element problems*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 2, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 61–67.
- [1194] H. FOERSTER, K. STÜBEN, AND U. TROTTERBERG, *Non-standard multigrid techniques using checkered relaxation and intermediate grids*, in Elliptic Problem Solvers, M. H. Schultz, ed., Academic Press, New York, 1981, pp. 285–300.
- [1195] H. FOERSTER AND K. WITSCH, *On efficient multigrid software for elliptic problems on rectangular domains*, Math. Comput. Simulation, XXIII (1981), pp. 293–298.
- [1196] ———, *Multigrid software for the solution of elliptic problems on rectangular domains: MG00 (Release 1)*, in Multigrid Methods, W. Hackbusch and U. Trotterberg, eds., vol. 960 of Lecture Notes in Mathematics, Berlin, 1982, Springer-Verlag, pp. 427–460.
- [1197] T. W. FOGWELL AND F. BRANKHAGEN, *Multigrid method for the solution of porous media multiphase flow equations*, in Nonlinear Hyperbolic Equations – Theory, Computation Methods, and Applications, vol. 24 of Notes on Numer. Fluid Mech., Vieweg, Braunschweig, 1989, pp. 139–148.
- [1198] C. K. FORESTER, *Advantages of multi-grid methods for certifying the accuracy of PDE modeling*, in Multigrid Methods, H. Lomax, ed., NASA Conference Publication 2202, Ames Research Center, Moffet Field, CA, 1982, pp. 23–45.
- [1199] S. FORESTI, S. HASSANZADEH, AND V. SONNAD, *A parallel element-by-element method for*

- large-scale computations with $h-p$ -finite elements*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 367–373.
- [1200] B. FORNBERG, *A Practical Guide to Pseudospectral Methods*, vol. 1 of Cambridge Monographs on Applied and Computational Mathematics, Cambridge University Press, Cambridge, 1996.
 - [1201] M. FORTIN AND R. ABOULAICH, *Schwarz's decomposition method for incompressible flow problems*, in First International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. Périaux, eds., Philadelphia, 1988, SIAM, pp. 333–349.
 - [1202] M. FORTIN, R. ABOULAICH, C. KARI, AND F. PITTE, *Domain decomposition methods for the Navier-Stokes equations*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 310–317.
 - [1203] M. FORTIN AND R. GLOWINSKI, *Augmented Lagrangians*, North-Holland, Amsterdam, 1983.
 - [1204] K. FOULADI AND O. BAYSAL, *Viscous simulation method for unsteady flows past multicomponent configurations*, Trans. ASME, J. Fluids Eng., 114 (1992), pp. 161–169.
 - [1205] K. FOULADI, O. BAYSAL, AND J. C. NEWMAN, *Hybrid domain decomposition for configurations with multiple nonsimilar components*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 476–484.
 - [1206] L. FOURNIER AND S. LANTERI, *Additive aspects of hybrid multigrid/domain decomposition solution of fluid flow problems on parallel computers*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 115–121.
 - [1207] G. C. FOX, *A graphical approach to load balancing and sparse matrix vector multiplication on the hypercube*, in Proceedings of IMA initiate, M. H. Schultz, ed., Springer-Verlag, 1986, pp. 37–51.
 - [1208] ———, *A review of automatic load balancing and decomposition methods for the hypercube*, in Proceedings of the IMA Institute, M. H. Schultz, ed., Springer-Verlag, 1986, pp. 63–76.
 - [1209] G. C. FOX, M. A. JOHNSON, G. A. LYZENGA, S. W. OTTO, J. K. SALMON, AND D. W. WALKER, *Solving Problems on Concurrent Processors, Vol. I*, Prentice-Hall, Englewood Cliffs, NJ, 1988.
 - [1210] J. M. FRAILONG AND J. PAKLEZA, *Resolution of a general partial differential equation on a fixed size SIMD/MIMD large cellular processor*, in Proceedings of the IMACS International Congress, Sorento, 1979.
 - [1211] R. FRANK, J. HERTLING, AND H. LEHNER, *Defect correction algorithms for stiff ordinary differential equations*, in Defect Correction Methods: Theory and Applications, K. Böhmer and H. J. Stetter, eds., Computing Suppl. 5, Springer-Verlag, Vienna, 1984, pp. 33–41.
 - [1212] B. FRANKE AND H.-O. LEILICH, *Berechnungsgrundlagen für das Datenkommunikationssystem in einem Multiprocessor für Mehrgitterverfahren*, in Rechnerarchitekturen für die numerische Simulation auf der Basis superschneller Lösungsverfahren II, U. Trottenberg and P. Wypior, eds., GMD-Studien Nr. 102, Gesellschaft für Mathematik und Datenverarbeitung, St. Augustin, 1985, pp. 15–120.
 - [1213] A. FRATI, F. PASQUARELLI, AND A. QUARTERONI, *Spectral Approximation to Advection-Diffusion Problems by the Fictitious Interface Method*, vol. n. 15, Quaderni del Seminario Matematico di Brescia, Italy, 1990. is this a book?
 - [1214] P. O. FREDERICKSON, *High performance parallel multigrid algorithms for unstructured grids*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 317–326.
 - [1215] P. O. FREDERICKSON AND O. A. MCBRYAN, *Parallel superconvergent multigrid*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 195–210.
 - [1216] ———, *Normalized convergence rates for the PSMG method*, SIAM J. Sci. Stat. Comput., 12 (1991), pp. 221–229.
 - [1217] M. H. FRESE, *Multiblock multigrid solution of the implicit time advance equations for magnetic resistive diffusion in geometrically complex regions*, in Multigrid Methods: Theory,

- Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 211–227.
- [1218] D. M. FRICKER, J. D. HOLDEMAN, AND S. P. VANKA, *Calculations of hot gas ingestion for a STOVL aircraft model*, J. Aircr., 31 (1994), pp. 236–242.
 - [1219] R. FRIEDRICH AND C. UHL, *Spatio temporal analysis of human electroencephalograms: Petit mal epilepsy*, Physica D, 98 (1996), pp. 171–182.
 - [1220] A. FROMMER, H. SCHWANDT, AND D. B. SZYLD, *Asynchronous weighted additive Schwarz methods*, Elect. Trans. Numer. Anal., 5 (1997), pp. 48–62.
 - [1221] A. FROMMER AND D. B. SZYLD, *Weighted max norms, splittings, and overlapping additive Schwarz iterations*, Numer. Math., 83 (1999), pp. 259–278.
 - [1222] M. FRUSCIONE, F. GUINDANI, S. PUNZI, AND P. STOFELLA, *Parallel application development with parallel computational frames*, in Proceedings of Massively Parallel Processing Applications and Development, Delft, The Netherlands, June 21–23, 1994, Amsterdam, 1994, Elsevier, pp. 269–276.
 - [1223] L. FUCHS, *A Newton–multi-grid method for the solution of non–linear partial differential equations*, in Boundary and Interior Layers—Computational and Asymptotic Methods, J. J. H. Miller, ed., Boole Press, Dublin, 1980, pp. 291–296.
 - [1224] ———, *Transonic flow computation by a multi–grid method*, in Numerical Methods for the Computation of Inviscid Transonic Flows with Shock Waves, A. Rizzi and H. Viviand, eds., Vieweg, Braunschweig, 1981, pp. 58–65.
 - [1225] ———, *Multi–grid solution of the Navier–Stokes equations on non–uniform grids*, in Multi–grid Methods, H. Lomax, ed., NASA Conference Publication 2202, Ames Research Center, Moffet Field, CA, 1982, pp. 83–100.
 - [1226] ———, *New relaxation methods for incompressible flow problems*, in Numerical methods in Laminar and Turbulent Flow, C. Taylor, J. A. Johnson, and W. R. Smith, eds., Swansea, 1983, Pineridge Press, pp. 627–641.
 - [1227] ———, *Defect corrections and higher numerical accuracy*, in Efficient Solution of Elliptic Systems, W. Hackbusch, ed., vol. 10 of Notes on Numerical Fluid Mechanics, Braunschweig, 1984, Vieweg, pp. 52–66.
 - [1228] ———, *Multi–grid schemes for incompressible flows*, in Efficient solution of Elliptic Systems, W. Hackbusch, ed., vol. 10 of Notes on Numerical Fluid Mechanics, Braunschweig, 1984, Vieweg, pp. 38–51.
 - [1229] ———, *An adaptive multi–grid scheme for simulation of flows*, in Multigrid Methods II, W. Hackbusch and U. Trottenberg, eds., Berlin, 1986, Springer–Verlag, pp. 122–134.
 - [1230] ———, *Turbulence modelling as a multi–level approach*, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 35–42.
 - [1231] L. FUCHS AND N. TILLMARK, *Numerical and experimental study of driven flow in a polar cavity*, Int. J. Numer. Meth. Fluids, 5 (1985), pp. 311–329.
 - [1232] L. FUCHS AND H.-S. ZHAO, *Solution of three–dimensional viscous incompressible flows by a multigrid method*, Int. J. Numer. Meth. Fluids, 4 (1984), pp. 539–555.
 - [1233] J. FUHRMAN, *Outlines of a modular algebraic multilevel method*, in AMLI'96: Proceedings of the Conference on Algebraic Multilevel Iteration Methods with Applications, vol. 1, Nijmegen, The Netherlands, 1996, University of Nijmegen, pp. 141–152.
 - [1234] S. R. FULTON, *Multigrid solution of the semi-geostrophic invertibility relation*, Mon. Wea. Rev., 117 (1989), pp. 2059–2066.
 - [1235] ———, *Multigrid solution on non–linear balance equations in meteorology*, Comm. Appl. Num. Methods, 8 (1992), pp. 695–706.
 - [1236] ———, *An adaptive multigrid model for hurricane track prediction*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 207–214.
 - [1237] ———, *A comparison of multilevel adaptive methods for hurricane track prediction*, Elect. Trans. Numer. Anal., 6 (1997), pp. 120–132.
 - [1238] ———, *An adaptive multigrid barotropic tropical cyclone track model*, Mon. Wea. Rev., 129 (2001), pp. 138–151.
 - [1239] S. R. FULTON, P. E. CIESIELSKI, AND W. H. SCHUBERT, *Multigrid methods for elliptic problems: a review*, Mon. Wea. Rev., 114 (1986), pp. 943–959.
 - [1240] D. FUNARO, *A multidomain spectral approximation of elliptic equations*, Numer. Meth. for PDE, 2 (1986), pp. 187–205.
 - [1241] ———, *Domain decomposition methods for pseudo-spectral approximations*, Numer. Math., 52 (1988), pp. 329–344.
 - [1242] ———, *Convergence analysis for pseudo spectral multidomain approximations of linear ad-*

- vection equations*, IMA J. Numer. Anal., 10 (1990), pp. 63–74.
- [1243] ———, *Pseudo spectral approximation of a P.D.E. defined on a triangle*, Appl. Math. Comput., 42 (1991), pp. 121–138.
- [1244] ———, *Polynomial Approximation of Differential Equations*, vol. 8 of Lecture Notes in Physics, Springer-Verlag, New York, 1992.
- [1245] D. FUNARO, A. QUATERONI, AND P. ZANOLLI, *An iterative procedure with interface relaxation for domain decomposition methods*, SIAM J. Numer. Anal., 25 (1988), pp. 1213–1236.
- [1246] K. Y. FUNG, J. TRIPP, AND B. GOBLE, *Adaptive refinement with truncation error injection*, Comp. Meth. Appl. Mech. Engng., 66 (1987), pp. 1–16.
- [1247] T. FURNIKE, *Computerized multiple level substructuring analysis*, Comput. Struct., 2 (1972), pp. 1063–1073.
- [1248] R. FUSTER, V. MIGALLON, AND J. PENADES, *Non-stationary parallel multisplitting AOR methods*, Elect. Trans. Numer. Anal., 4 (1996), pp. 1–13.
- [1249] H. G. GALBAS AND O. KOLP, *A parallel program for computerized tomography*, in Proceedings of ParCo93. Parallel Computing 93, Grenoble, France, September 7-10, 1993, Amsterdam, 1994, Elsevier, pp. 509–512.
- [1250] E. GALLIGANI AND V. RUGGIERO, *A parallel preconditioner for block tridiagonal matrices*, in Proceedings of ParCo93. Parallel Computing 93, Grenoble, France, September 7-10, 1993, Amsterdam, 1994, Elsevier, pp. 113–120.
- [1251] M. J. GANDER, *Overlapping Schwarz for parabolic problems*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 97–104.
- [1252] M. J. GANDER AND F. NATAF, *AILU: A preconditioner based on the analytic factorization of the elliptic operator*, Numer. Lin. Alg. Appl., 7 (2000), pp. 505–526.
- [1253] D. B. GANNON, *Self adaptive methods for parabolic partial differential equations*, PhD thesis, Univ. of Illinois at Urbana-Champaign, Urbana, Illinois, 1980.
- [1254] ———, *On the structure of parallelism in a highly concurrent PDE solver*, in Computer Arithmetic, H. Kai, ed., Silver Springs, MD, 1985, IEEE, pp. 252–259.
- [1255] D. B. GANNON AND J. R. ROSENDALE, *On the structure of parallelism in a highly concurrent pde solver*, J. Parallel Distrib. Comput., 3 (1986), pp. 106–135.
- [1256] M. GARBEY, *Quasilinear hyperbolic-hyperbolic singular perturbation problem: study of a shock layer*, Math. Meth. Appl. Sci., 11 (1989), pp. 237–252.
- [1257] ———, *Domain decomposition to solve layers and singular perturbation problems*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 293–305.
- [1258] ———, *Domain decomposition to solve transition layers and asymptotics*, SIAM J. Sci. Comput., 15 (1994), pp. 866–891.
- [1259] M. GARBEY AND J. S. SCROGGS, *Asymptotic-induced method for conservation laws*, in Asymptotic analysis and the numerical solution of partial differential equations, New York, New York, 1990, Marcel Dekker, Inc., pp. 75–98.
- [1260] M. GARBEY, L. VIRY, AND O. COULAUD, *A Funaro-Quarteroni procedure for singularly perturbed elliptic boundary value problems*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 548–557.
- [1261] U. GÄRTEL AND K. RESSEL, *Parallel multigrid: grid partitioning versus domain decomposition*, in Proceedings of the 10th International Conference on Computing Methods in Applied Sciences and Engineering, R. Glowinski, ed., New York, 1992, Nova Science Publishers, pp. 559–568.
- [1262] J. GARY, *The multigrid iteration applied to the collocation method*, SIAM J. Numer. Anal., 18 (1981), pp. 211–224.
- [1263] ———, *On higher order multigrid methods with application to a geothermal reservoir model*, Int. J. Numer. Meth. Fluids, 2 (1982), pp. 43–60.
- [1264] J. GARY, S. F. MCCORMICK, AND R. A. SWEET, *Successive overrelaxation, multigrid, and preconditioned conjugate gradients algorithms for solving a diffusion problem on a vector computer*, Appl. Math. Comput., 13 (1983), pp. 285–310.
- [1265] P. H. GASKELL, A. K. C. LAU, AND N. G. WRIGHT, *Two efficient solution strategies for use with higher order discretisation schemes, in the simulation of fluid flow problems*, in Numerical Methods in Laminar and Turbulent Problems, Proceedings of The Fifth International Conference, Swansea, 1987, Pineridge Press.
- [1266] ———, *The accurate approximation and economic solution of steady-state convection dominated flows*, in Numerical Methods for Fluid Dynamics III, IMA Conference series, Oxford, 1988, Clarendon Press, pp. 425–?

- [1267] ———, *Comparison of two strategies for use with higher order discretisation schemes in fluid flow simulation*, Int. J. Numer. Meth. Fluids, 8 (1988), pp. 1203–1215.
- [1268] P. H. GASKELL AND N. G. WRIGHT, *A multigrid algorithm for the investigation of thermal recirculating fluid flow problems*, in Proc. 5th Int. Conf. on Numer. Methods for Thermal Problems, R. W. Lewis, K. Morgan, and W. G. Habashi, eds., vol. 5, Numerical Methods in Thermal Problems, Swansea, 1987, Pineridge, pp. 1194–1215.
- [1269] ———, *Multigrids applied to a solution technique for recirculating fluid flow problems*, in The Proceedings of the IMA Conference on Simulation and Optimisation of Large Systems, A. J. Osiadacz, ed., Reading, 1988, pp. 51–55.
- [1270] C. GASPAR, *A fast multigrid solution of boundary integral equations*, Environ. Softw., 5 (1990), pp. 26–28.
- [1271] ———, *An iterative and multigrid solution of boundary integral equations*, Comput. Math. Appl., 29 (1995), pp. 89–101.
- [1272] C. GÁSPÁR, *Biharmonic and bi-Helmholtz type scattered data interpolation using quadtrees and multigrid technique*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 122–128.
- [1273] F. GASTALDI, L. GASTALDI, AND A. QUATERONI, *ADN and ARN domain decomposition methods for advection-diffusion equations*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 334–341.
- [1274] F. GASTALDI AND A. QUATERONI, *On the coupling of hyperbolic and parabolic systems: analytical and numerical approach*, Appl. Numer. Math., 6 (1989), pp. 3–31.
- [1275] F. GASTALDI, A. QUATERONI, AND G. S. LANDRIANI, *Effective methods for the treatment of interfaces separating equations of different character*, in Computers and Experiments in Fluid Flow, G. M. Carlomagno and C. A. Brebbia, eds., Computational Mechanics Publications, Springer-Verlag, Berlin, Heidelberg, New York, 1989, pp. 65–74.
- [1276] ———, *On the coupling of the two dimensional hyperbolic and elliptic equations: analytical and numerical approach*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1990, pp. 22–63.
- [1277] L. GASTALDI, *A domain decomposition for the transport equation*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 97–102.
- [1278] G. N. GATICA AND G. C. HSIAO, *The coupling of boundary element and finite element methods for a nonlinear exterior boundary value problem*, Zeitschrift für Analysis und ihr Anwendungen (ZAA), B28 (1989), pp. 377–387.
- [1279] S. P. GAUR AND A. BRANDT, *Numerical solution of semiconductor transport equations in two dimensions by multi-grid method*, in Advances in Computer Methods for Partial Differential Equations II, R. Vichnevetsky, ed., IMACS (AICA), New Brunswick, NJ, 1977, pp. 327–329.
- [1280] G. GAZZANIGA AND G. SACCHI, *Parallel implementation of domain decomposition methods for the solution of elliptic boundary value problems*, in Parallel Processing for Scientific Computing, SIAM Proceedings, Philadelphia, 1995, SIAM, pp. 395–396.
- [1281] P. GBURZYNSKI AND J. MAITAN, *Performance of multigrid network architecture (MNA) under uniform load*, in Proceedings of SPIE - The International Society for Optical Engineering, vol. 1784, Bellingham, WA, 1993, Int. Soc. for Optical Engineering, pp. 270–281.
- [1282] P. GBURZYNSKI, J. MAITAN, AND D. ROBERTSON, *A simple and scalable architecture for rapidly expandable networks*, in Proceedings of the Twenty Seventh Hawaii International Conference on System Sciences Vol. I: Architecture, vol. I, 1994, pp. 481–490.
- [1283] R. J. GELINAS, S. K. DOSS, AND K. MILLER, *The moving finite element method: application to general partial differential equations with multiple large gradients*, J. Comput. Phys., 40 (1981), pp. 202–249.
- [1284] E. GELMAN AND J. MANDEL, *Multilevel algorithms for optimization problems*, Math. Progr. Ser. B, 48 (1990), pp. 1–18.
- [1285] E. GENDLER, *Multigrid methods for time-dependent parabolic equations*, master's thesis, The Weizmann Institute of Science, Rehovot, Israel, 1986.
- [1286] W. GENTZSCH, *Vectorization of computer programs with applications to computational fluid dynamics*, in Notes on Numerical Fluid Dynamics, vol. 8, Vieweg, Braunschweig, 1984.
- [1287] A. GEORGE, *Nested dissection of a regular finite element mesh*, SIAM J. Numer. Anal., 10 (1973), pp. 345–363.
- [1288] A. GEORGE AND J. LIU, *Computer Solution of Large Sparse Positive Definite Systems*, Prentice-Hall, Englewood Cliffs, N.J., 1981.

- [1289] W. GEORGE, R. G. BRICKNER, AND S. L. JOHNSSON, *POLYSHIFT communications software for the connection machine system CM-200*, Scientific Programming, 3 (1994), pp. 83–99.
- [1290] A. GERSZTENKORN AND J. C. DIAZ, *Domain decomposed preconditioning for faulted geological blocks*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 457–462.
- [1291] E. A. GERTEISEN AND R. GRUBER, *A computational environment based on a domain decomposition approach*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 629–635.
- [1292] L. GEUS, *Parallelisierung eines Mehrgitterverfahrens für die Navier–Stokes–Gleichungen auf EGPA–Systemen*, PhD thesis, Institut für Mathematische Maschinen und Datenverarbeitung (Informatik), Universität Erlangen/Nürnberg, 1985.
- [1293] L. GEUS, W. HENNING, W. SEIDL, AND J. VOLKERT, *MG00–Implementierungen auf EGPA–Multiprozessorsystemen*, in Rechnerarchitekturen für die numerische Simulation auf der Basis superschneller Lösungsverfahren II, U. Trottenberg and P. Wypior, eds., GMD–Studien Nr. 102, Gesellschaft für Mathematik und Datenverarbeitung, St. Augustin, 1985, pp. 121–136.
- [1294] N. K. GHADDAR, K. Z. KORCZAK, B. B. MIKIC, AND A. T. PATERA, *Numerical investigation of incompressible flow in grooved channels, Part 1: Stability and self-sustained oscillations*, J. Fluid Mech., 163 (1986), p. 99.
- [1295] ———, *Numerical investigation of incompressible flow in grooved channels, Part 2: Resonance and oscillatory heat transfer*, J. Fluid Mech., 168 (1986), p. 541.
- [1296] F. GHAFFARI, J. M. LUCKRING, J. L. THOMAS, AND B. L. BATES, *Navier–Stokes solutions about the F/A-18 Forebody–LEX configuration*, AIAA, 89-0338 (1989).
- [1297] ———, *Navier–Stokes solutions about the F/A-18 Forebody–LEX configuration*, J. Aircr., 27 (1990), pp. 737–748.
- [1298] S. GHANEMI, *A domain decomposition method for Helmholtz scattering problems*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 105–112.
- [1299] K. N. GHIA, U. GHIA, D. R. REDDY, AND C. T. SHIN, *Multigrid simulation of asymptotic curved-duct flows using a semi-implicit numerical technique*, in Proc. Symposium on Computers in Flow and Fluid Dynamics Experiments, Washington, D. C., 1981, ASME.
- [1300] U. GHIA, K. N. GHIA, AND C. T. SHIN, *High-Re solutions for incompressible Navier–Stokes equations and a multi-grid method*, J. Comput. Phys., 48 (1982), pp. 387–411.
- [1301] U. GHIA, R. RAMAMURTI, AND K. N. GHIA, *Solution of the Neumann pressure problem in general orthogonal coordinates using the multigrid technique*, AIAA J., 26 (1988), pp. 538–547.
- [1302] S. GHOSAL, J. MANDEL, AND R. TEZAUR, *Automatic substructuring for domain decomposition using neural networks*, in 1994 IEEE International Conference on Neural Networks. IEEE World Congress on Computational Intelligence (Cat. No.94CH3429-8), vol. 6, New York, NY, 1994, IEEE, pp. 3816–3821.
- [1303] S. GHOSAL AND P. VANĚK, *A fast scalable algorithm for discontinuous optical flow estimation*, IEEE Trans. Pattern Anal. Mach. Intell., 18 (1996), pp. 181–195.
- [1304] D. K. GHOSH AND P. K. BASU, *Parallel adaptive finite element analysis of large scale structures*, Comput. Sys. Eng., 5 (1994), pp. 325–335.
- [1305] M. GIJZEN, *Parallel iterative solution methods for linear finite element computations on the CRAY T3D*, in Proceedings of International Conference on High Performance Computing and Networking. HPCN '95 Milan, Italy, May 3–5, 1995, Berlin, 1995, Springer-Verlag, pp. 723–728.
- [1306] W. K. GILOI, *Kritische Betrachtungen und konstruktive Vorschläge zur Frage der Entwicklung eines grossen MIMD–Multiprozessorsystems für numerische Anwendungen (schnelle Lösungsverfahren)*, in Rechnerarchitekturen für die numerische Simulation auf der Basis superschneller Lösungsverfahren I, U. Trottenberg and P. Wypior, eds., GMD–Studien Nr. 88, Gesellschaft für Mathematik und Datenverarbeitung, St. Augustin, 1984, pp. 161–194.
- [1307] L. V. GILJOVA AND V. V. SHAIDUROV, *A cascadic multigrid algorithm in finite element method for an indefinite-sign elliptic problem*, in 5th European Multigrid Conference Special Topics and Applications, University of Stuttgart, Stuttgart, 1998, pp. 74–89.
- [1308] L. GIRAUD AND G. M. MANZINI, *Parallel distributed implementations of 2D explicit Euler solvers high performance computing and networking*, in International Conference and Exhibition Proceedings, vol. 1: Applications 1994, Berlin, Germany, 1994, Springer

- Verlag, pp. 151–156.
- [1309] L. GIRAUD AND R. S. TUMINARO, *Domain decomposition algorithms for PDE problems with large scale variation*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 205–210.
- [1310] V. GIRAUT AND P.-A. RAVIART, *Finite Element Methods for the Navier–Stokes Equations*, Springer–Verlag, New York, 1986. Also, 1979.
- [1311] T. GJESDAL, *Smoothing analysis of multicolour pattern schemes*, J. Comput. Appl. Math., 85 (1987), pp. 345–350.
- [1312] ———, *A cell-centred multigrid for all grid sizes*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 327–338.
- [1313] ———, *A note on the additive correction multigrid method*, International Communications in Heat and Mass Transfer, 23 (1996), pp. 293–298.
- [1314] ———, *Accuracy and convergence of defect correction in an incompressible multigrid solver based on pressure correction smoothers*, in Multigrid Methods V, vol. 3 of Lecture Notes in Computational Science and Engineering, Berlin, 1998, Springer, pp. 90–104.
- [1315] ———, *Local grid refinement method for improved gas safety analysis*, in Computational Fluid Dynamics ’98: (Proceedings of the Fourth ECCOMAS Conference on Computational Fluid Dynamics), K. D. Papailiou, D. Tsahalis, J. Périaux, C. Hirsch, and M. Pandolfi, eds., vol. 1, John Wiley & Sons, 1998, pp. 398–402.
- [1316] ———, *Local grid refinement for improved description of leaks in industrial gas safety analysis*, Computing and Visualization in Science, 3 (2000), pp. 25–32.
- [1317] T. GJESDAL AND M. E. H. LOSSIUS, *Comparison of pressure correction smoothers for multigrid solution of incompressible flow*, Int. J. Numer. Methods Fluids, 25 (1997), pp. 393–405.
- [1318] T. GJESDAL, M. E. H. LOSSIUS, AND R. TEIGLAND, *Multigrid solution of incompressible flow using pressure correction smoothers*, in Proceedings of the Third Annual Conference of the CFD Society of Canada, 1995, pp. 145–152.
- [1319] T. GJESDAL AND R. TEIGLAND, *Accuracy and stability of semi-implicit finite difference advection schemes*, Commun. Numer. Meth. Engng., 14 (1998), pp. 647–655.
- [1320] F. GLAZER, *Multilevel relaxation in low level computer vision*, in Multiresolution Image Processing and Analysis, A. Rosenfeld, ed., Springer–Verlag, 1984, pp. 312–330.
- [1321] G. GLOBISCH, *On an automatically parallel generation technique for tetrahedral meshes*, Parallel Comput., 21 (1995), pp. 1979–1995.
- [1322] ———, *PARMESH – a parallel mesh generator*, Parallel Comput., 21 (1995), pp. 509–524.
- [1323] G. GLOBISCH AND M. JUNG, *Mehrgitterverfahren für Interfaceprobleme*, in Fifth Multigrid Seminar, Eberswalde 1990, S. Hengst, ed., Berlin, 1990, Karl–Weierstrass–Institut, pp. 60–84. Report R–MATH–09/90.
- [1324] G. GLOBISCH AND U. LANGER, *On the use of multigrid preconditioners in a multigrid software package*, in Fourth Multigrid Seminar, Unterwirbach 1988, G. Telischow, ed., Berlin, 1990, Karl–Weierstrass–Institut, pp. 105–134. Report R–MATH–03/90.
- [1325] R. GLOWINSKI, *Numerical Methods for Nonlinear Variational Problems*, Springer–Verlag, New York, 1984.
- [1326] ———, *Viscous flow simulation by finite element methods and related numerical techniques*, in Progress and Supercomputing in Computational Fluid Dynamics, Birkhauser, Boston, 1985, pp. 173–210.
- [1327] R. GLOWINSKI, Q. V. DINH, AND J. PÉRIAUX, *Domain decomposition methods for nonlinear problems in fluid dynamics*, Comput. Meth. Appl. Mech. Engrg., 40 (1983), pp. 27–109.
- [1328] R. GLOWINSKI, G. H. GOLUB, G. A. MEURANT, AND J. PÉRIAUX, *First International Symposium on Domain Decomposition Methods for Partial Differential Equations*, SIAM, Philadelphia, 1988.
- [1329] R. GLOWINSKI, W. KINTON, AND M. F. WHEELER, *Acceleration of domain decomposition algorithms for mixed finite elements by multi-level methods*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1990, SIAM, pp. 263–289.
- [1330] R. GLOWINSKI AND P. LETALLEC, *Augmented Lagrangian interpretation of the nonoverlapping Schwarz alternating method*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1990, SIAM, pp. 224–231.

- [1331] R. GLOWINSKI, T.-W. PAN, AND J. PÉRIAUX, *One shot domain decomposition/fictitious domain method for the Stokes problem*, in Advances in Finite Element Analysis in Fluid Dynamics American Society of Mechanical Engineers, Fluids Engineering Division, M. N. Dhaubhadel, M. S. Engelman, and W. G. Habash, eds., vol. 171, ASME, New York, NY, 1993, pp. 115–124.
- [1332] R. GLOWINSKI, T. W. PAN, AND J. PÉRIAUX, *A fictitious domain method for Dirichlet problem and applications*, Comp. Meth. Appl. Mech. Engng., 111 (1994), pp. 283–303.
- [1333] ———, *A fictitious domain method for external incompressible viscous flow modeled by Navier–Stokes equations*, Comp. Meth. Appl. Mech. Engng., 112 (1994), pp. 133–148.
- [1334] R. GLOWINSKI, T.-W. PAN, AND J. PÉRIAUX, *A fictitious domain method for unsteady incompressible viscous flow modelled by Navier–Stokes equations*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 421–431.
- [1335] ———, *A one shot domain decomposition/fictitious domain method for Navier–Stokes equations*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 211–222.
- [1336] R. GLOWINSKI, T. W. PAN, AND J. PÉRIAUX, *A one shot domain decomposition/fictitious domain method for the solution of elliptic equations*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North–Holland), Amsterdam, 1995, pp. 317–324.
- [1337] R. GLOWINSKI, T.-W. PAN, AND J. PÉRIAUX, *On a domain embedding method for flow around moving rigid bodies*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 342–349.
- [1338] R. GLOWINSKI, J. PÉRIAUX, AND G. TERRASSON, *On the coupling of viscous and inviscid models for compressible fluid flows via domain decomposition*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1990, pp. 64–97.
- [1339] R. GLOWINSKI AND O. PIRONNEAU, *Numerical methods for the first biharmonic equation and for the two-dimensional Stokes problem*, SIAM Review, 21 (1979), pp. 167–212.
- [1340] R. GLOWINSKI AND M. F. WHEELER, *Domain decomposition and mixed finite element methods for elliptic problems*, in First International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. Périaux, eds., Philadelphia, 1988, SIAM, pp. 144–172.
- [1341] R. H. J. GMELIG MEYLING, W. A. MULDER, AND G. H. SCHMIDT, *Porous media flow on locally refined grids*, in Numerical Methods for the Simulation of Multi-Phase and Complex Flow, T. Verheggen, ed., Springer-Verlag, Berlin, 1992, pp. 90–105.
- [1342] E. D. GOEDE, J. GROENEWEG, AND K. H. TAN, *Domain decomposition method for the three-dimensional shallow water equations*, Simul. Pract. Theory, 3 (1995), pp. 307–325.
- [1343] B. GOERTZEL, *An adaptive multilevel connectionist scheme for black box global optimization*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 2, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 69–89.
- [1344] D. GOLBY AND M. A. LESCHZINER, *Parallel computations of turbulent transonic flows on a Meiko computing surface*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North–Holland), Amsterdam, 1995, pp. 143–150.
- [1345] C. I. GOLDSTEIN, *Analysis and application of multigrid method preconditioners for singularly perturbed boundary value problems*, SIAM J. Numer. Anal., 26 (1989), pp. 1090–1123.
- [1346] ———, *Multigrid convergence estimates for finite element methods with numerical integration*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 2, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 91–113.
- [1347] ———, *Solving time harmonic wave problems on vector processors*, in Proceedings of the 2nd IMACS Symposium on Computational Acoustics, D. Lee and M. H. Schultz, eds., North Holland, Amsterdam, The Netherlands, 1990, pp. 253–266.
- [1348] ———, *Multigrid analysis of finite element methods with numerical integration*, Math. Comp., 56 (1991), pp. 409–436.
- [1349] ———, *Multigrid methods for elliptic problems in unbounded domains*, SIAM J. Numer. Anal., 30 (1993), pp. 159–183.

- [1350] W. L. GOLIK, *Numerical study of multigrid methods with various smoothers for the elliptic grid generation equations*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 339–346.
- [1351] U. GÖLLNER, *Ein singulär gestörtes parabolisches Anfangsrandwertproblem und seine numerische Behandlung*, PhD thesis, Institut für Angewandte Mathematik, Universität Bonn, 1983.
- [1352] K. S. GOLOVANIVSKY AND G. MELIN, *A study of the parallel energy distribution of lost electrons from the central plasma of an electron cyclotron resonance ion source*, Rev. Sci. Instrum., 63 (1992), pp. 2886–2888.
- [1353] G. GOLUB, A. SAMEH, AND V. SARIN, *A parallel balanced method for sparse systems*, Numer. Lin. Alg. Appl., 8 (2001), pp. 297–316.
- [1354] G. H. GOLUB AND D. MAYER, *The use of preconditioning over irregular regions*, in Computing Methods in Applied Sciences and Engineering VI, R. Glowinski and J.-L. Lions, eds., North-Holland, Amsterdam, 1984, pp. 3–14.
- [1355] G. H. GOLUB AND C. F. VAN LOAN, *Matrix Computations*, Johns Hopkins Univ. Press, Baltimore, MD, 1983. First edition.
- [1356] ———, *Matrix Computations*, Johns Hopkins Univ. Press, Baltimore, MD, 1989. Second edition.
- [1357] ———, *Matrix Computations*, Johns Hopkins Univ. Press, Baltimore, MD, 1996. Third edition.
- [1358] G. GOLUBOVICI AND C. POPA, *Interpolation and related coarsening techniques for the algebraic multigrid method*, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 201–213.
- [1359] J. GOODMAN AND A. D. SOKAL, *Multigrid Monte Carlo method for lattice field theories*, Phys. Rev. Lett., 56 (1986), pp. 1015–1018.
- [1360] ———, *Multigrid Monte Carlo method. Conceptual foundations*, Phys. Rev., D40 (1989), pp. 2035–2071.
- [1361] S. GOOSSENS AND D. ROOSE, *Ritz and harmonic Ritz values and the convergence of FOM and GMRES*, Numer. Lin. Alg. Appl., 6 (1999), pp. 281–293.
- [1362] S. GOOSSENS, K. TAN, AND D. ROOSE, *An efficient FGMRES solver for the shallow water equations based on domain decomposition*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 350–358.
- [1363] D. GOOVAERTS, *Domain decomposition methods for elliptic partial differential equations*, PhD thesis, Catholic University in Leuven, May 1990.
- [1364] B. GÖRG AND O. KOLP, *Parallele Rechnerarchitekturen für Mehrgitteralgorithmen*, in Rechnerarchitekturen für die numerische Simulation auf der Basis superschneller Lösungsverfahren II, U. Trottenberg and P. Wypior, eds., GMD-Studien Nr. 102, Gesellschaft für Mathematik und Datenverarbeitung, St. Augustin, 1985, pp. 137–150.
- [1365] S. GOTO, *An efficient algorithm for the two-dimensional placement problem in electrical circuit layout*, IEEE Trans. Circuits and Systems, CAS-28 (1981).
- [1366] D. GOTTLIEB AND R. S. HIRSH, *Parallel pseudo-spectral domain decomposition techniques*, J. Sci. Comput., 4 (1989), pp. 309–325.
- [1367] D. GOTTLIEB AND S. A. ORSZAG, *Numerical Analysis of Spectral Methods*, SIAM, Philadelphia, 1977.
- [1368] J. GOZANI, *Conjugate gradient coupled with multigrid for an indefinite problem*, in Advances in Computer Methods for Partial Differential Equations V, R. Vichnevetsky and R. Stepleman, eds., IMACS, New York, 1984.
- [1369] R. GRAB, M. GUNTHER, U. WEVER, AND Q. ZHENG, *Optimization of parallel multilevel Newton algorithms on workstation clusters*, in Proceedings of European Conference on Parallel Processing EURO PAR '96, vol. 2, Berlin, 1996, Springer-Verlag, pp. 91–96.
- [1370] M. GRABENSTEIN AND B. MIKESKA, *Multigrid Monte Carlo algorithm with higher cycles in the sine Gordon model*, Phys. Rev. D (Particles, Fields, Gravitation, and Cosmology), 47 (1993), pp. 3103–3105.
- [1371] ———, *Multigrid Monte Carlo in the sine Gordon model*, Nucl. Phys. B, Proc. Suppl., 34 (1994), pp. 765–767.
- [1372] M. GRABENSTEIN AND K. PINN, *Acceptance rates in multigrid Monte Carlo simulations*, Phys. Rev. D, Part. Fields Gravit. Cosmol., 45 (1992), pp. 4372–4375.
- [1373] ———, *Theoretical analysis of acceptance rates in multigrid Monte Carlo*, Nucl. Phys. B, Proc. Suppl., 30 (1993), pp. 265–268.
- [1374] ———, *Multigrid Monte Carlo algorithms for SU(2) lattice gauge theory: two versus four*

- dimensions*, Phys. Rev. D, Part. Fields, 50 (1994), pp. 6998–7010.
- [1375] I. G. GRAHAM AND M. J. HAGGER, *Additive Schwarz, CG and discontinuous coefficients*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 113–120.
- [1376] R. GRAHAM, E. LAWLER, J. LENSTRA, AND A. R. KAN, *Optimization and approximation in deterministic sequencing and scheduling: A survey*, vol. 5, North-Holland, Amsterdam, 1979, pp. 287–326.
- [1377] F. GRASSO AND M. MARINI, *Multigrid techniques for hypersonic viscous flows*, AIAA J., 31 (1993), pp. 1729–1731.
- [1378] ———, *Solutions of hypersonic viscous flows with total variation diminishing multigrid techniques*, Comput. Fluids, 24 (1995), pp. 571–592.
- [1379] R. GRAUER AND T. C. SIDERIS, *Numerical computation of 3D incompressible ideal fluids with swirl*, Phys. Rev. Lett., 67 (1991), pp. 3511–3514.
- [1380] T. GRAUSCHOPF, M. GRIEBEL, AND H. REGLER, *Additive multilevel-preconditioners based on bilinear interpolation, matrix dependent geometric coarsening and algebraic multigrid coarsening for second order elliptic PDEs*, Appl. Numer. Math., 23 (1997), pp. 63–96.
- [1381] A. GREENBAUM, *Analysis of a multigrid method as an iterative technique for solving linear systems*, SIAM J. Numer. Anal., 21 (1984), pp. 473–485.
- [1382] ———, *A multigrid method for multiprocessors*, Appl. Math. Comput., 19 (1986), pp. 75–88.
- [1383] A. GREENBAUM, C. LI, AND Z. C. HAN, *Parallelizing preconditioned conjugate gradient algorithms*, Comput. Phys. Comm., 53 (1989), pp. 295–309.
- [1384] A. GREENBAUM, M. ROZŁOŃNIK, AND Z. STRAKOŠ, *Numerical behaviour of the modified Gram-Schmidt GMRES implementation*, BIT, 37 (1997), pp. 706–719.
- [1385] F. A. GREENE, *Application of the multigrid solution technique to hypersonic entry vehicles*, J. Spacecraft and Rockets, 31 (1994), pp. 744–750.
- [1386] M. GRIEBEL, *The combination technique for the sparse grid solution of pdes on multiprocessor machines*, Paral. Proc. Lett., 2 (1992), pp. 61–70.
- [1387] ———, *Grid- and point-oriented multilevel algorithms*, in Incomplete Decomposition (ILU): Theory, Technique and Application, Proceedings of the Eighth GAMM-Seminar, Kiel, 1992, vol. 41 of Notes on Numerical Fluid Mechanics, Vieweg, Braunschweig, 1992, pp. 32–46.
- [1388] ———, *Grid- and point-oriented multilevel algorithms*, in Incomplete Decompositions (ILU) – Algorithms, Theory, and Applications, W. Hackbusch and G. Wittum, eds., Notes on Numerical Fluid Mechanics, Vieweg, Braunschweig, 1993, pp. 32–46.
- [1389] ———, *Domain-oriented multilevel methods*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 223–229.
- [1390] ———, *A domain decomposition method using sparse grids*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 255–261.
- [1391] ———, *Multilevel algorithms considered as iterative methods on semidefinite systems*, SIAM J. Sci. Stat. Comput., 15 (1994), pp. 547–565.
- [1392] ———, *Multilevelmethoden als Iterationsverfahren über Erzeugendensystemen*, Teubner Skripten zur Numerik, Teubner Verlag, Stuttgart, 1994.
- [1393] ———, *Parallel point-oriented multilevel methods*, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 215–232.
- [1394] ———, *Punktblock-Multilevelmethoden zur Lösung elliptischer Differentialgleichungen*, PhD thesis, Institut für Informatik, TU München, 1994.
- [1395] ———, *Parallel domain-oriented multilevel methods*, SIAM J. Sci. Comput., 16 (1995), pp. 1105–1125.
- [1396] M. GRIEBEL, T. DORNSEIFER, AND T. NEUNHOFFER, *Numerische Simulation in der Strömungsmechanik, eine praxisorientierte Einführung*, Vieweg-Verlag, Braunschweig, 1995.
- [1397] M. GRIEBEL, W. HUBER, U. RÜDE, AND T. STÖRTKUHL, *The combination technique for parallel sparse-grid- preconditioning or -solution of PDEs on workstation networks*, in Parallel Processing: CONPAR 92 –VAPP V, Proceedings of the Second Joint International Conference on Vector and Parallel Processing, Lyon, France, September 1–3, 1992, vol. 634 of Lecture Notes in Computer Science, Berlin, 1992, Springer-Verlag, pp. 217–228.

- [1398] M. GRIEBEL AND T. NEUNHOEFFER, *Parallel point- and domain- oriented multilevel methods for elliptic pde's on workstation networks*, J. Comp. Appl. Math., 66 (1996), pp. 267–268.
- [1399] M. GRIEBEL AND P. OSWALD, *On additive Schwarz preconditioners for sparse grid discretization*, Numer. Math., 66 (1994), pp. 449–464.
- [1400] ———, *On the abstract theory of additive and multiplicative Schwarz algorithms*, Numer. Math., 70 (1995), pp. 163–180.
- [1401] ———, *Tensor product type subspace splittings and multilevel iterative methods for anisotropic problems*, Adv. Comput. Math., 4 (1995), pp. 171–206.
- [1402] M. GRIEBEL, M. SCHNEIDER, AND C. ZENGER, *A combination technique for the solution of sparse grid problems*, in Proceedings of the IMACS International Symposium on Iterative Methods in Linear Algebra, Amsterdam, 1992, Elsevier, pp. 263–281.
- [1403] M. GRIEBEL AND V. THURNER, *Solving CFD-problems efficiently by the combination method*, CFD-News, 2 (1993), pp. 19–31.
- [1404] ———, *The efficient solution of fluid dynamics problems by the combination technique*, Int. J. Numer. Methods Heat Fluid Flow, 5 (1995), pp. 251–269.
- [1405] M. GRIEBEL AND C. ZENGER, *Numerical Simulation in Science and Engineering*, vol. 48 of Notes on Numerical Fluid Mechanics, Vieweg-Verlag, Braunschweig, 1994. Proceedings of the FORTWIHR Symposium on High Performance Scientific Computing in Munich, June 17–18 1993.
- [1406] M. GRIEBEL, C. ZENGER, AND S. ZIMMER, *Multilevel Gauss-Seidel-algorithms for full and sparse grid problems*, Computing, 50 (1993), pp. 127–148.
- [1407] M. GRIEBEL AND S. ZIMMER, *Adaptive point block methods*, in Adaptive Methods – Algorithms, Theory and Applications, vol. 46 of Notes on Numerical Fluid Mechanics, Braunschweig, 1994, Vieweg, pp. 142–157.
- [1408] M. GRIEBEL AND G. W. ZUMBUSCH, *Parallel multigrid in an adaptive PDE solver based on hashing*, in Proceedings of ParCo '97, E. D'Hollander, G. Joubert, F. Peters, and U. Trottenberg, eds., Elsevier, 1997, pp. 589–599.
- [1409] ———, *Parnass: Porting gigabit-LAN components to a workstation cluster*, in Proceedings of the First Workshop Cluster-Computing, W. Rehm, ed., no. CSR-97-05 in Chemnitzer Informatik Berichte, TU Chemnitz, 1997, pp. 101–124.
- [1410] ———, *Hash-storage techniques for adaptive multilevel solvers and their domain decomposition parallelization*, in Proceedings of Domain Decomposition Methods 10, DD10, J. Mandel, C. Farhat, and X.-C. Cai, eds., no. 218 in Contemporary Mathematics, Providence, 1998, AMS, pp. 279–286.
- [1411] F. F. GRINSTEIN, H. RABITZ, AND A. ASKAR, *The multigrid method for accelerated solution of the discretized Schrödinger equation*, J. Comput. Phys., 49 (1983), pp. 423–512.
- [1412] ———, *Steady state reactive kinetics on surfaces exhibiting defect structures*, J. Chem. Phys., 82 (1985), pp. 3434–3441.
- [1413] P. GRISVARD, *Behavior of solutions of an elliptic boundary value problem in polygonal or polyhedral domains*, in Numerical Solution of Partial Differential Equations – III, B. Hubbard, ed., Academic Press, New York, 1976, pp. 207–274.
- [1414] ———, *Elliptic Problems in Nonsmooth Domains*, Pitman, Boston, 1985.
- [1415] ———, *Singularities in Boundary Value Problems*, vol. 22 of Research Notes in Applied Mathematics, Masson, Paris, 1992.
- [1416] W. D. GROPP, *Local uniform mesh refinement with moving grids*, SIAM J. Sci. Stat. Comput., 8 (1987), pp. 292–304.
- [1417] ———, *Solving PDEs on loosely-coupled parallel processors*, Parallel Comput., 5 (1987), pp. 165–173.
- [1418] ———, *Parallel computing and domain decomposition*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 349–361.
- [1419] W. D. GROPP AND D. E. KEYES, *Complexity of parallel implementation of domain decomposition techniques for elliptic partial differential equations*, SIAM J. Sci. Stat. Comput., 9 (1988), pp. 312–326.
- [1420] ———, *Domain decomposition on parallel computers*, Impact Comput. Sci. Eng., 1 (1989), pp. 421–439.
- [1421] ———, *Domain decomposition on parallel computers*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 260–288.
- [1422] ———, *A domain decomposition method with locally uniform mesh refinement*, in Third

- International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Péliaux, and O. B. Widlund, eds., Philadelphia, 1990, SIAM, pp. 115–129.
- [1423] ———, *Parallel domain decomposition and the solution of nonlinear systems of equations*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Péliaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 373–381.
- [1424] ———, *Domain decomposition methods in computational fluid dynamics*, Int. J. Numer. Meth. Fluids, 14 (1992), pp. 147–165.
- [1425] ———, *Domain decomposition with local mesh refinement*, SIAM J. Sci. Stat. Comput., 13 (1992), pp. 967–993.
- [1426] ———, *Parallel performance of domain-decomposed preconditioned Krylov methods for PDE's with locally uniform refinement*, SIAM J. Sci. Stat. Comput., 13 (1992), pp. 128–145.
- [1427] W. D. GROPP, D. E. KEYES, AND J. S. MOUNTS, *Implicit domain decomposition algorithms for steady, compressible aerodynamics*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 203–213.
- [1428] W. D. GROPP, D. E. KEYES, AND M. D. TIDRIRI, *Parallel implicit solvers for steady, compressible aerodynamics*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North-Holland), Amsterdam, 1995, pp. 391–399.
- [1429] W. D. GROPP, E. LUSK, AND A. SKJELLMU, *Using MPI: Portable Parallel Programming with the Message-Passing Interface*, Scientific and Engineering Computation, MIT Press, Cambridge, MA, 1994.
- [1430] W. D. GROPP AND B. F. SMITH, *Experiences with domain decomposition in three dimensions: overlapping Schwarz methods*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 323–333.
- [1431] C. E. GROSCH, *Performance analysis of Poisson solvers on array computers*, in Supercomputers, vol. 2, Infotech International, Maidenhead, 1979, pp. 147–181.
- [1432] L. GROSZ, *Preconditioning by incomplete block elimination*, Numer. Lin. Alg. Appl., 7 (2000), pp. 527–541.
- [1433] F. GRUTTMANN AND W. WAGNER, *On the numerical analysis of local effects in composite structures*, Compos. Struct., 29 (1994), pp. 1–12.
- [1434] J. GU AND X. HU, *Some recent developments in domain decomposition methods with nonconforming finite elements*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 51–56.
- [1435] T. GU, *Estimates of convergence rate of parallel multisplitting interreactive methods with their applications*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 259–266.
- [1436] J.-L. GUERMOND AND W.-Z. SHEN, *A domain decomposition method for simulating 2D external viscous flows*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 463–467.
- [1437] M. F. GUEST, P. SHERWOOD, AND J. H. VAN LENTHE, *Parallelism in computational chemistry. I. Hypercube connected multicomputers*, Theor. Chim. Acta, 84 (1993), pp. 423–441.
- [1438] W. GUI AND I. BABUŠKA, *The h , p and $h-p$ versions of the finite element method for one-dimensional problems. Part I: The error analysis of the p -version*, Numer. Math., 49 (1986), pp. 577–612.
- [1439] ———, *The h , p and $h-p$ versions of the finite element method for one-dimensional problems. Part II: The error analysis of the h and p versions*, Numer. Math., 49 (1986), pp. 613–657.
- [1440] ———, *The h , p and $h-p$ versions of the finite element method for one-dimensional problems. Part III: The adaptive $h-p$ version*, Numer. Math., 49 (1986), pp. 659–683.
- [1441] H. GUILLARD AND N. MARCO, *Some aspects of multigrid methods on non-structured meshes*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A.

- Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 347–362.
- [1442] K. L. GUNDY-BURLET AND M. M. RAI, *Two-dimensional computation of multi-stage compressor flows using a zonal approach*, AIAA, 89 (1989), p. 2452.
- [1443] R. GUO AND R. D. SKEEL, *An algebraic hierarchical basis preconditioner*, Appl. Numer. Math., 9 (1992), pp. 21–32.
- [1444] M. M. GUPTA, J. KOUATCHOU, AND J. ZHANG, *A compact multigrid solver for convection-diffusion equations*, J. Comput. Phys., 132 (1997), pp. 123–129.
- [1445] ———, *Comparison of second and fourth order discretizations for multigrid Poisson solver*, J. Comput. Phys., 132 (1997), pp. 226–232.
- [1446] S. N. GUPTA, M. ZUBAIR, AND C. E. GROSCH, *A multigrid algorithm for parallel computers: CPMG*, J. Sci. Comput., 7 (1992), pp. 263–279.
- [1447] K. GUSTAFSON AND R. LEBEN, *Multigrid calculation of subvortices*, Appl. Math. Comput., 19 (1986), pp. 89–102.
- [1448] ———, *Multigrid localization and multigrid grid generation for the computation of vortex structures and dynamics in cavities and about airfoils*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 229–250.
- [1449] ———, *Vortex subdomains*, in First International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. Périaux, eds., Philadelphia, 1988, SIAM, pp. 370–380.
- [1450] B. GUSTAFSSON AND G. LINDESKOG, *Parallelizing incomplete factorization preconditioning methods*, in Incomplete Decompositions (ILU) – Algorithms, Theory, and Applications, W. Hackbusch and G. Wittum, eds., vol. 41 of Notes on Numerical Fluid Mechanics, Braunschweig, 1993, Vieweg, pp. 47–56.
- [1451] B. GUSTAFSSON AND P. LÖTSTEDT, *Analysis of the multigrid method applied to first order systems*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 181–233.
- [1452] ———, *Analysis of the multigrid method applied to hyperbolic equations*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 2, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 115–145.
- [1453] I. GUSTAFSSON, *A class of first order factorization methods*, BIT, 18 (1978), pp. 142–156.
- [1454] ———, *An incomplete factorization preconditioning method based on modification of element matrices*, BIT, 36 (1996), pp. 86–100.
- [1455] K. GUSTAVSON, *Trigonometric interpretation of iterative methods*, in AMLI'96: Proceedings of the Conference on Algebraic Multilevel Iteration Methods with Applications, vol. 1, Nijmegen, The Netherlands, 1996, University of Nijmegen, pp. 23–29.
- [1456] D. G. GUTE, Y. HUANG, S. S. PAI, AND D. HOPKINS, *Isolating elasto-plastic material behavior using multilevel substructuring techniques in a parallel computing environment*, in Collection of Technical Papers - Proceedings of the AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, vol. 3, New York, NY, 1994, AIAA, pp. 1546–1555.
- [1457] M. H. GUTKNECHT, *Lanczos-type solvers for nonsymmetric linear systems of equations*, Acta Numer., 6 (1997), pp. 271–397.
- [1458] G. HAASE, *Multilevel extension techniques in domain decomposition preconditioners*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 359–367.
- [1459] ———, *A parallel AMG for overlapping and non-overlapping domain decomposition*, Elect. Trans. Numer. Anal., 10 (2000), pp. 41–55.
- [1460] G. HAASE AND U. LANGER, *On the use of multigrid preconditioners in the domain decomposition method*, in Parallel Algorithms for PDEs, W. Hackbusch, ed., Braunschweig, 1990, Vieweg, pp. 101–110. Proc. of the 6th GAMM-Seminar, Kiel, 1990.
- [1461] ———, eds., *Virtual Proceedings of the Strobl Workshop on Algebraic Multigrid Methods*, Cos Cob, CT, 2000, MGNet. In virtual proceedings area of <http://www.mgnet.org>.
- [1462] G. HAASE, U. LANGER, AND A. MEYER, *A new approach to the Dirichlet domain decomposition method*, in Fifth Multigrid Seminar, Eberswalde 1990, S. Hengst, ed., Berlin, 1990, Karl-Weierstrass-Institut, pp. 1–59. Report R-MATH-09/90.
- [1463] ———, *The approximate dirichlet domain decomposition method. Part I: An algebraic approach*, Comput., 47 (1991), pp. 137–151.
- [1464] ———, *Approximate Dirichlet domain decomposition method. Part II: Applications to 2nd-*

- order elliptic B.V.P.s*, Comput., 47 (1991), pp. 153–167.
- [1465] ———, *Domain decomposition methods with inexact subdomain solvers*, J. Numer. Lin. Alg. Appl., 1 (1991), pp. 27–41.
- [1466] ———, *Parallelisierung und Vorkonditionierung des CG-Verfahrens durch Gebietszerlegung*, in Numerische Algorithmen auf Transputer-Systemen, G. Bader, R. Rannacher, and G. Wittum, eds., Stuttgart, 1993, Teubner-Verlag, pp. 80–116. Proceedings of the GAMM-Seminar Heidelberg, 1991.
- [1467] G. HAASE, U. LANGER, A. MEYER, AND S. V. NEPOMNYASCHIKH, *Hierarchical extension operators and local multigrid methods in domain decomposition preconditioners*, E. W. J. Numer. Math., 2 (1994), pp. 173–193.
- [1468] W. HACKBUSCH, *A fast numerical method for elliptic boundary value problems with variable coefficients*, in Proc. Second GAMM-Conference on Numerical Methods in Fluid Mechanics, E. H. Hirschel and W. Geller, eds., Köln, 1977, DFVLR, pp. 50–57.
- [1469] ———, *A fast iterative method for solving Helmholtz's equation in a general region*, in Fast Elliptic Solvers, U. Schumann, ed., Advance Publications, London, 1978, pp. 112–124.
- [1470] ———, *A fast iterative method for solving Poisson's equation in a general region*, in Numerical Treatment of Partial Differential Equations, R. Bulirsch, R. D. Grigorieff, and J. Schröder, eds., vol. 631 of Lecture Notes in Mathematics, Berlin, 1978, Springer-Verlag, pp. 51–62.
- [1471] ———, *On the multigrid method applied to difference equations*, Computing, 20 (1978), pp. 291–306.
- [1472] ———, *On the computation of approximate eigenvalues and eigenfunctions of elliptic operators by means of a multi-grid method*, SIAM J. Numer. Anal., 16 (1979), pp. 201–215.
- [1473] ———, *On the fast solution of parabolic boundary control problems*, SIAM J. Control Optim., 17 (1979), pp. 231–244.
- [1474] ———, *On the fast solutions of nonlinear elliptic equations*, Numer. Math., 32 (1979), pp. 83–95.
- [1475] ———, *Convergence of multi-grid iterations applied to difference equations*, Math. Comp., 34 (1980), pp. 425–440.
- [1476] ———, *The fast numerical solution of very large elliptic difference schemes*, J. Inst. Math. Appl., 26 (1980), pp. 119–132.
- [1477] ———, *Numerical solution of nonlinear equations by the multigrid iteration of the second kind*, in Numerical Methods for Nonlinear Problems, C. Taylor, ed., Swansea, 1980, Pineridge Press, pp. 1041–1050.
- [1478] ———, *On the fast solving of elliptic control problems*, J. Optim. Theory Appl., (1980), pp. 565–581.
- [1479] ———, *Survey of convergence proofs for multigrid iterations*, in Special Topics of Applied Mathematics, J. Frehse, D. Pallaschke, and U. Trottenberg, eds., North-Holland, Amsterdam, 1980, pp. 151–164.
- [1480] ———, *Bemerkungen zur iterierten Defektkorrektur und zu ihrer Kombination mit Mehrgitterverfahren*, Rev. Roumaine Math. Pures Appl., 26 (1981), pp. 1319–1329.
- [1481] ———, *Die schnelle Auflösung der Fredholmschen Integralgleichung zweiter Art*, Beiträge Numer. Math., 9 (1981), pp. 47–62.
- [1482] ———, *Error analysis of the nonlinear multigrid method of the second kind*, Appl. Math., 26 (1981), pp. 18–29.
- [1483] ———, *The fast numerical solution of time periodic parabolic problems*, SIAM J. Sci. Stat. Comput., 2 (1981), pp. 198–206.
- [1484] ———, *Numerical solution of linear and nonlinear parabolic control problems*, in Optimization and Optimal Control, A. Auslender, W. Oettli, and J. Stoer, eds., vol. 30 of Lecture Notes in Control and Information Sciences, Springer-Verlag, Berlin, 1981, pp. 179–185.
- [1485] ———, *On the convergence of multi-grid iterations*, Beiträge Numer. Math., 9 (1981), pp. 213–239.
- [1486] ———, *On the regularity of difference schemes*, Ark. Mat., 19 (1981), pp. 71–95.
- [1487] ———, *Optimal $H^{**}p,p/2$ error estimates for a parabolic Galerkin method*, SIAM J. Numer. Anal., 18 (1981), pp. 681–692.
- [1488] ———, *Multi-grid convergence theory*, in Multigrid Methods, W. Hackbusch and U. Trottenberg, eds., vol. 960 of Lecture Notes in Mathematics, Berlin, 1982, Springer-Verlag, pp. 177–219.
- [1489] ———, *Multi-grid solution of continuation problems*, in Iterative Solution of Nonlinear Systems of Equations, R. Ansorge, T. Meis, and W. Törnig, eds., vol. 953 of Lecture Notes in Mathematics, Berlin, 1982, Springer-Verlag, pp. 20–45.
- [1490] ———, *On multi-grid iterations with defect corrections*, in Multigrid Methods, W. Hack-

- busch and U. Trottenberg, eds., vol. 960 of Lecture Notes in Mathematics, Berlin, 1982, Springer–Verlag, pp. 461–473.
- [1491] ———, *Introduction to multi-grid methods for the numerical solution of boundary value problems*, in Computational Methods for Turbulent, Transonic and Viscous Flows, J. A. Essers, ed., Hemisphere, Washington, D.C., 1983.
- [1492] ———, *On the regularity of difference schemes—part II: regularity estimates for linear and nonlinear problems*, Ark. Mat., 21 (1983), pp. 3–28.
- [1493] ———, *Efficient solution of elliptic systems*, vol. 10 of Notes on Numerical Fluid Mechanics, Vieweg, Braunschweig, 1984.
- [1494] ———, *Local defect correction method and domain decomposition techniques*, in Defect Correction Methods: Theory and Applications, K. Böhmer and H. J. Stetter, eds., Computing Suppl. 5, Springer–Verlag, Vienna, 1984, pp. 89–113.
- [1495] ———, *Multi-grid convergence for a singular perturbation problem*, J. Lin. Alg. Applic., 58 (1984), pp. 125–145.
- [1496] ———, *Multi-grid solutions to linear and nonlinear eigenvalue problems for integral and differential equations*, Rostock Math. Colloq., 25 (1984), pp. 79–98.
- [1497] ———, *Parabolic multi-grid methods*, in Computing Methods in Applied Sciences and Engineering VI, R. Glowinski and J.-L. Lions, eds., Amsterdam, 1984, North–Holland.
- [1498] ———, *Parabolic multi-grid methods*, in Computing Methods in Applied Sciences and Engineering VI, R. Glowinski and J.-L. Lions, eds., North–Holland, Amsterdam, 1984.
- [1499] ———, *Multi-grid eigenvalue computation*, in Advances in Multi-Grid Methods, D. Braess, W. Hackbusch, and U. Trottenberg, eds., vol. 11 of Notes on Numerical Fluid Mechanics, Braunschweig, 1985, Vieweg, pp. 24–32.
- [1500] ———, *Multigrid Methods and Applications*, vol. 4 of Computational Mathematics, Springer–Verlag, Berlin, 1985.
- [1501] ———, *Multigrid methods of the second kind*, in Multigrid Methods for Integral and Differential Equations, D. J. Paddon and H. Holstein, eds., vol. 3 of The Institute of Mathematics and Its Applications Conference Series, Clarendon Press, Oxford, 1985, pp. 11–84.
- [1502] ———, *A new approach to robust multi-grid solvers*, in ICIAM'87: Proceedings of the First International Conference on Industrial and Applied Mathematics, A. H. P. Burgh and R. M. M. Mattheij, eds., SIAM, Philadelphia, 1988, pp. 114–126.
- [1503] ———, *The frequency decomposition multi-grid algorithm*, in Robust Multi-Grid Methods, W. Hackbusch, ed., vol. 23 of Notes on Numerical Fluid Mechanics, Braunschweig, 1989, Vieweg, pp. 96–104.
- [1504] ———, *The frequency decomposition multigrid method, part I: Application to anisotropic equations*, Numer. Math., 56 (1989), pp. 229–245.
- [1505] ———, *On first and second order box schemes*, Computing, 41 (1989), pp. 277–296.
- [1506] ———, *Robust Multi-Grid Methods*, vol. 23 of Notes on Numerical Fluid Mechanics, Vieweg, Braunschweig, 1989.
- [1507] ———, *The frequency decomposition multi grid method. II. Convergence analysis based on the additive Schwarz method*, Numer. Math., 63 (1992), pp. 433–453.
- [1508] ———, *Iterative Solution of Large Sparse Systems of Equations*, Springer–Verlag, Berlin, 1993.
- [1509] ———, *The frequency decomposition multi-grid method*, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 43–56.
- [1510] W. HACKBUSCH AND G. HOFMANN, *Results of the eigenvalue problem for the plate equation*, Z. Angew. Math. Phys., 31 (1981), pp. 730–739.
- [1511] W. HACKBUSCH AND H. D. MITTELMANN, *On multi-grid methods for variational inequalities*, Numer. Math., 42 (1983), pp. 65–76.
- [1512] W. HACKBUSCH AND Z. P. NOWAK, *Multigrid methods for calculating the lifting potential incompressible flows around three-dimensional bodies*, in Multigrid Methods II, W. Hackbusch and U. Trottenberg, eds., Berlin, 1986, Springer–Verlag, pp. 135–148.
- [1513] ———, *On the fast matrix multiplication in the boundary element method by panel clustering*, Numer. Math., 54 (1989), pp. 463–491.
- [1514] W. HACKBUSCH AND A. REUSKEN, *Analysis of a damped nonlinear multilevel method*, Numer. Math., 55 (1989), pp. 225–246.
- [1515] ———, *On global multigrid convergence for nonlinear problems*, in Robust Multi-Grid Methods, W. Hackbusch, ed., vol. 23 of Notes on Numerical Fluid Mechanics, Braunschweig, 1989, Vieweg, pp. 105–113.
- [1516] W. HACKBUSCH AND U. TROTTERBERG, *Multigrid Methods*, vol. 960 of Lecture Notes in Mathematics, Springer–Verlag, Berlin, 1982.

- [1517] W. HACKBUSCH AND T. WILL, *A numerical method for a parabolic bang–bang problem*, Control Cybernet., 12 (1983), pp. 99–110.
- [1518] W. HACKBUSCH AND G. WITTUM, *Incomplete Decompositions (ILU) – Algorithms, Theory, and Applications*, vol. 41 of Notes on Numerical Fluid Mechanics, Vieweg, Braunschweig, 1993.
- [1519] ———, *Adaptive Methods – Algorithms, Theory and Applications, Proceedings of the Ninth GAMM–Seminar, Kiel, Jan. 22–24, 1993*, vol. 46 of Notes on Numerical Fluid Mechanics, Vieweg, Braunschweig, 1994.
- [1520] ———, *5th European Multigrid Conference Special Topics and Applications*, University of Stuttgart, Stuttgart, 1998.
- [1521] ———, *Multigrid Methods V*, vol. 3 of Lecture Notes in Computational Science and Engineering, Springer, Berlin, 1998.
- [1522] M. G. HACKENBERG, W. JOPPICH, AND S. MIJALKOVIC, *A parallel multigrid environment for coupled problems on time-dependent structures*, in 5th European Multigrid Conference Special Topics and Applications, University of Stuttgart, Stuttgart, 1998, pp. 90–100.
- [1523] M. HAGHOO AND W. PROSKUROWSKI, *Parallel efficiency of a domain decomposition method*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périoux, and O. B. Widlund, eds., Philadelphia, 1989, SIAM, pp. 269–281.
- [1524] T. HAGSTROM, R. P. TEWARSON, AND A. JAZCILEVICH, *Numerical experiments on a domain decomposition algorithm for nonlinear elliptic boundary value problems*, Appl. Math. Lett., 1 (1988), pp. 299–302.
- [1525] H. HAHN, *Mehrskalen–Methoden der Statistischen Physik: Ausgangspunkte zuu Mehrgitter–Verfahren für die statistisch–physikalische Numerik*, in Rechnerarchitekturen für die numerische Simulation auf der Basis superschneller Lösungsverfahren II, U. Trottenberg and P. Wypior, eds., GMD–Studien Nr. 102, Gesellschaft für Mathematik und Datenverarbeitung, St. Augustin, 1985, pp. 233–240.
- [1526] D. B. HAIDVODEL AND A. BECKMANN, *Numerical Ocean Circulation Modeling*, vol. 2 of Environmental Science and Management, Imperial College Press, London, 1999.
- [1527] D. B. HAIDVOGEL AND T. A. ZANG, *The accurate solution of Poisson's equation by expansion in Chebyshev polynomials*, J. Comput. Phys., 30 (1979), pp. 167–180.
- [1528] Y. R. HAKOPIAN AND Y. A. KUZNETSOV, *Algebraic multigrid/substructuring preconditioners on triangular grids*, Sov. J. Numer. Anal. Math. Modell., 6 (1991), pp. 453–483.
- [1529] ———, *Algebraic multigrid/fictitious domain preconditioners on quasihierarchical triangular grids*, Russian J. Numer. Anal. Math. Modelling, 9 (1994), pp. 201–222.
- [1530] M. G. HALL, *Advances and shortcomings in the calculation of inviscid flows with shock waves*, in Numerical Methods in Aeronautical fluid Dynamics, P. L. Roe, ed., London, 1982, Academic Press, pp. 33–60.
- [1531] ———, *Cell vertex multigrid schemes for solution of the Euler equations*, in Numerical methods for Fluid Dynamics II, K. W. Morton and M. J. Baines, eds., Clarendon Press, Oxford, 1986, pp. 303–?
- [1532] L. HAMANDI, R. LEE, AND F. OZGUNER, *Review of domain decomposition methods for the implementation of FEM on massively parallel computers*, IEEE Antennas Propag. Mag., 37 (1995), pp. 93–98.
- [1533] D. HÄNEL, M. MEINKE, AND W. SCHRÖDER, *Application of the multigrid method in solution of the compressible Navier–Stokes equations*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 2, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 149–166.
- [1534] ———, *Application of the multigrid method in solutions of the compressible Navier–Stokes equations*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 234–254.
- [1535] D. HÄNEL, W. SCHRÖDER, AND G. SEIDER, *Multigrid methods for the solution of the compressible Navier–Stokes equations*, in Robust Multi–Grid Methods, W. Hackbusch, ed., vol. 23 of Notes on Numerical Fluid Mechanics, Braunschweig, 1989, Vieweg, pp. 114–127.
- [1536] M. R. HANISCH, *A multigrid preconditioner for the biharmonic Dirichlet problem*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 2, Denver, 1991, University of Colorado, pp. 1–21.
- [1537] ———, *Multigrid Preconditioning for Mixed Finite Element Methods*, PhD thesis, Cornell, Ithaca, NY, 1991.

- [1538] ———, *Multigrid preconditioning for the biharmonic Dirichlet problem*, SIAM J. Numer. Anal., 30 (1993), pp. 184–214.
- [1539] V. HANNEMANN, D. HEMPEL, AND T. SONAR, *Adaptive computation of compressible fluid flow*, in Adaptive Methods – Algorithms, Theory and Applications, vol. 46 of Notes on Numerical Fluid Mechanics, Braunschweig, 1994, Vieweg, pp. 158–166.
- [1540] D. HANSEN, *An adaptive pseudo-spectral domain decomposition methods for partial differential equations*, master's thesis, Dept. of Electrical Engineering and Computer Science, Northwestern University, Evanston, IL, 1990.
- [1541] Z. HARAS, *The 3-satisfiability problem: a multi-level annealing approach*, master's thesis, The Weizmann Institute of Science, Rehovot, Israel, 1988.
- [1542] Z. HARAS AND S. TA'ASAN, *Large discretization step (LDS) methods for evolution equations*, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 233–244.
- [1543] G. H. HARDY, J. E. LITTLEWOOD, AND G. PÓLYA, *Inequalities*, Cambridge University Press, Cambridge, 1934.
- [1544] M. HARMATZ, P. LAUWERS, S. SOLOMON, AND T. WITTLICH, *Visual study of zero modes role in PTMG convergence*, Nucl. Phys. B, Proc. Suppl., 30 (1993), pp. 192–199.
- [1545] M. HARMATZ, P. G. LAUWERS, R. BEN AV, A. BRANDT, E. KATZNELSON, S. SOLOMON, AND K. WOLOWESKY, *Parallel transported multigrid and its application to the Schwinger model*, Nucl. Phys. B, Proc. Suppl., 20 (1991), pp. 102–109.
- [1546] L. HART AND S. F. MCCORMICK, *Asynchronous multilevel adaptive methods for solving partial differential equations on multiprocessors: basic ideas*, Parallel Comput., 12 (1989), pp. 131–144.
- [1547] L. HART, S. F. MCCORMICK, A. O'GALLAGHER, AND J. W. THOMAS, *The fast adaptive composite grid method (FAC): Algorithms for advanced computers*, Appl. Math. Comput., 19 (1986), pp. 103–126.
- [1548] A. HARTEN, D. LAX, AND B. LEER, *On upstream differencing and Godunov schemes for hyperbolic conservation laws*, SIAM Review, 25 (1983).
- [1549] M. HASENBUSCH AND S. MEYER, *Multigrid acceleration for asymptotically free theories*, Nucl. Phys. B, Proc. Suppl., 26B (1992), pp. 610–612.
- [1550] ———, *Testing accelerated algorithms in the lattice CP³ model*, Phys. Rev. D, Part. Fields Gravit. Cosmol., 26B (1992), pp. 4376–4380.
- [1551] M. HASENBUSCH, S. MEYER, AND G. MACK, *Noncritical multigrid Monte Carlo: O(3) non linear sigma model*, Nucl. Phys. B, Proc. Suppl., 20 (1991), pp. 110–113.
- [1552] R. L. HAUPT AND S. E. HAUPT, *Multigrid with MATLAB*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 1, Denver, 1991, University of Colorado, pp. 59–65.
- [1553] ———, *Introduction to multigrid using MATLAB*, Comput. Appl. Eng. Educ., 5 (1993), pp. 421–431.
- [1554] S. E. HAUPT, R. L. HAUPT, AND J. C. ADAMS, *Multigrid analysis of four-point probe measurements of tapered resistive sheets*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 1, Denver, 1991, University of Colorado, pp. 117–126.
- [1555] L. J. HAYES AND P. DEVLOO, *An element-by-element block iterative method for large nonlinear problems*, in ASME-WAM, W. K. Liu and T. Belytschko, eds., Swansea, UK, 1985, Pineridge Press.
- [1556] ———, *A vectorized version of a sparse matrix vector multiply*, Int. J. Numer. Meth. Engng., 23 (1986), pp. 1043–1056.
- [1557] J. HE AND L. KANG, *Parallel multigrid algorithms based on wavelet multiresolution approximations*, Neural Parallel Sci. Comput., 1 (1993), pp. 421–430.
- [1558] Q. HE AND L. KANG, *Schwarz domain decomposition method for multidimensional and nonlinear evolution equations: subdomains have overlap*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 57–64.
- [1559] F. K. HEBEKER, *On a multigrid method to solve the integral equations of 3-D Stokes flow*, in Efficient Solution of Elliptic Systems, W. Hackbusch, ed., vol. 10 of Notes on Numerical Fluid Mechanics, Braunschweig, 1984, Vieweg, pp. 67–73.
- [1560] ———, *Experiences with the vectorization of a boundary element code for the Neumann problem of the Laplacean*, in Applications of Supercomputers in Engineering: Fluid Flow and Stress Analysis Applications, C. A. Brebbia and A. Peters, eds., North-Holland, Amsterdam, 1989, pp. 159–167.

- [1561] ———, *On multigrid methods of the first kind for symmetric boundary integral equations of nonnegative order*, in Robust Multi-Grid Methods, W. Hackbusch, ed., vol. 23 of Notes on Numerical Fluid Mechanics, Braunschweig, 1989, Vieweg, pp. 128–138.
- [1562] ———, *On a parallel Schwarz algorithm for symmetric strongly elliptic integral equations*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 382–393.
- [1563] ———, *On parallel simulation of reactive flows on an IBM RS/6000 workstation-cluster*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North-Holland), Amsterdam, 1995, pp. 73–80.
- [1564] G. W. HEDSTROM AND F. A. HOWES, *A domain decomposition method for a convection diffusion equation with turning points*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 38–46.
- [1565] ———, *Domain decomposition for a boundary-value problem with a shock layer*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1990, SIAM, pp. 130–140.
- [1566] G. W. HEDSTROM AND G. H. RODRIQUE, *Adaptive-grid methods for time-dependent partial differential equations*, in Multigrid Methods, W. Hackbusch and U. Trottenberg, eds., vol. 960 of Lecture Notes in Mathematics, Berlin, 1982, Springer-Verlag, pp. 474–484.
- [1567] A. F. HEGARTY, J. J. H. MILLER, E. O'RIORDAN, AND G. I. SHISHKIN, *On numerical experiments with central difference operators on special piecewise uniform meshes for problems with boundary layers*, in Adaptive Methods – Algorithms, Theory and Applications, vol. 46 of Notes on Numerical Fluid Mechanics, Braunschweig, 1994, Vieweg, pp. 167–176.
- [1568] M. HEINKENSCHLOSS, C. T. KELLEY, AND H. T. TRAN, *Fast algorithms for nonsmooth compact fixed point problems*, SIAM J. Numer. Anal., 29 (1992), pp. 1769–1792.
- [1569] B. HEINRICH, *The box method for elliptic interface problems on locally refined meshes*, in Adaptive Methods – Algorithms, Theory and Applications, vol. 46 of Notes on Numerical Fluid Mechanics, Braunschweig, 1994, Vieweg, pp. 177–186.
- [1570] W. HEINRICHS, *Collocation and full multigrid methods*, Appl. Math. Comput., 28 (1988), pp. 35–45.
- [1571] ———, *Line relaxation for spectral multigrid methods*, J. Comput. Phys., 77 (1988), pp. 166–182.
- [1572] ———, *Multigrid methods for combined finite difference and Fourier problems*, J. Comput. Phys., 78 (1988), pp. 424–436.
- [1573] ———, *Effective preconditioning for spectral multigrid methods*, in Robust Multi-Grid Methods, W. Hackbusch, ed., vol. 23 of Notes on Numerical Fluid Mechanics, Braunschweig, 1989, Vieweg, pp. 139–144.
- [1574] ———, *Improved condition number for spectral methods*, Math. Comp., 53 (1989), pp. 103–119.
- [1575] ———, *Konvergenzaussagen für Kollokationsverfahren bei elliptischen Randwertaufgaben*, Numer. Math., 54 (1989), pp. 619–637.
- [1576] ———, *Spectral methods with sparse matrices*, Numer. Math., 56 (1989), pp. 25–41.
- [1577] ———, *Algebraic spectral multigrid methods*, Comput. Meth. Appl. Mech., 80 (1990), pp. 281–289.
- [1578] ———, *A 3d spectral multigrid method*, Appl. Math. Comput., 41 (1991), pp. 117–128.
- [1579] ———, *Einschließungsaussagen bei Systemen semilinearer parabolischer Differentialgleichungen*, Appl. of Math., 36 (1991), pp. 96–122.
- [1580] ———, *Stabilization techniques for spectral methods*, J. Sci. Comput., 6 (1991), pp. 1–19.
- [1581] ———, *A stabilized treatment of the biharmonic operator with spectral methods*, SIAM J. Sci. Stat. Comput., 12 (1991), pp. 1162–1172.
- [1582] ———, *A spectral multigrid method for the Stokes problem in streamfunction formulation*, J. Comput. Phys., 102 (1992), pp. 310–318.
- [1583] ———, *A stabilized multidomain approach for singular perturbation problems*, J. Sci. Comput., 7 (1992), pp. 95–125.
- [1584] ———, *Strong convergence estimates for pseudospectral methods*, Appl. of Math., 37 (1992), pp. 401–417.
- [1585] ———, *Distributive relaxations for the spectral Stokes operator*, J. Sci. Comput., 8 (1993), pp. 389–398.
- [1586] ———, *Domain decomposition for fourth order problems*, SIAM J. Numer. Anal., 30 (1993), pp. 435–453.

- [1587] ———, *Finite element preconditioning for spectral multigrid methods*, Appl. Math. Comput., 59 (1993), pp. 19–40.
- [1588] ———, *Spectral multigrid methods for domain decomposition problems using patching techniques*, Appl. Math. Comput., 59 (1993), pp. 165–176.
- [1589] ———, *Spectral multigrid methods for the reformulated Stokes equations*, J. Comput. Phys., 107 (1993), pp. 213–224.
- [1590] ———, *Spectral multigrid techniques for the Navier–Stokes equations*, Comp. Meth. Appl. Mech. Engng., 106 (1993), pp. 297–314.
- [1591] ———, *Spectral projective newton methods for quasilinear elliptic boundary value problems*, Calcolo, 29 (1993), pp. 33–48.
- [1592] ———, *Splitting techniques for the pseudospectral approximation of the unsteady Stokes equations*, SIAM J. Numer. Anal., 30 (1993), pp. 19–40.
- [1593] ———, *Defect correction for the advection diffusion equation*, Comput. Methods Appl. Mech. Eng., 119 (1994), pp. 191–197.
- [1594] ———, *Domain decomposition for the Stokes equations in streamfunction formulation*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 263–269.
- [1595] ———, *Spectral methods for singular perturbation problems*, Appl. Math., 39 (1994), pp. 161–188.
- [1596] ———, *Defect correction for Boussinesq flow*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 368–373.
- [1597] ———, *Operator splitting for the unsteady Stokes equations*, in 5th European Multigrid Conference Special Topics and Applications, University of Stuttgart, Stuttgart, 1998, pp. 101–112.
- [1598] W. HEINRICH AND H. EISEN, *A new method of stabilization for singular perturbation problems with spectral methods*, SIAM J. Numer. Anal., 29 (1992), pp. 107–122.
- [1599] W. HEINRICH, H. EISEN, AND K. WITSCH, *Spectral collocation methods and polar coordinate singularities*, J. Comput. Phys., 96 (1991), pp. 241–257.
- [1600] W. HEINRICH AND D. FUNARO, *Some results about the pseudospectral approximation of one-dimensional fourth-order problems*, Numer. Math., 58 (1990), pp. 399–419.
- [1601] B. HEISE, *Multigrid–Newton methods for the calculation of electromagnetic fields*, in Third Multigrid Seminar, Biesenthal 1988, G. Telschow, ed., Berlin, 1989, Karl–Weierstrass–Institut, pp. 53–73. Report R–MATH–03/89.
- [1602] ———, *Nichtlineare Berechnung stationärer Magnetfelder einer Gleichstrommaschine mittels Full–Multigrid–Newton–Techniken*, in Fourth Multigrid Seminar, Unterwirbach 1989, G. Telschow, ed., Berlin, 1990, Karl–Weierstrass–Institut, pp. 135–146. Report R–MATH–03/90.
- [1603] ———, *Berechnung stationärer elektromagnetischer Felder mit Full–Multigrid–Newton–Techniken*, in Deutsche Mathematiker–Vereinigung, Jahrestagung 15.–20.9.1991 in Bielefeld, Vortragsauszüge, 1991, p. 297.
- [1604] ———, *Sensitivity analysis for nonlinear magnetic field simulation*, in Modelling Uncertain Data, H. Bandemer, ed., Berlin, 1992, Akademie Verlag, pp. 40–45. Mathematical Research, vol. 68. Proc. of GAMM–Workshop, Bergakademie Freiberg, March 21–24, 1992.
- [1605] ———, *Nonlinear field calculations with multigrid Newton methods*, Impact Comput. Sci. Eng., 5 (1993), pp. 75–110.
- [1606] B. HEISE AND M. JUNG, *Robust parallel Newton–multilevel methods*, in AMLI'96: Proceedings of the Conference on Algebraic Multilevel Iteration Methods with Applications, vol. 1, Nijmegen, The Netherlands, 1996, University of Nijmegen, pp. 153–168.
- [1607] ———, *Parallel solvers for nonlinear elliptic problems based on domain decomposition ideas*, Parallel Comput., 22 (1997), pp. 1527–1544.
- [1608] ———, *Efficiency, scalability, and robustness of parallel multilevel methods for nonlinear partial differential equations*, SIAM J. Sci. Comput., 20 (1999), pp. 553–567.
- [1609] B. HEISE AND M. KUHN, *Parallel sovers for linear and nonlinear exterior magnetic field problems based on coupled FE/BE formulations*, Computing, 56 (1996), pp. 237–258.
- [1610] F. HEITZ, P. PEREZ, AND P. BOUTHEMY, *Multiscale minimization of global energy functions in some visual recovery problems*, CVGIP: Image Understanding, 59 (1994), pp. 125–134.
- [1611] P. W. HEMKER, *The incomplete LU–decomposition as a relaxation method in multi-grid algorithms*, in Boundary and Interior Layers—Computational and Asymptotic Methods, J. J. H. Miller, ed., Boole Press, Dublin, 1980, pp. 306–311.

- [1612] ———, *Multi-grid bibliography*, in Colloquium Numerical Integration of Partial Differential Equations, J. Verwer, ed., Dept. of Numerical Mathematics, Mathematical Center, Amsterdam, 1980.
- [1613] ———, *On the structure of an adaptive multi-level algorithm*, BIT, 20 (1980), pp. 289–301.
- [1614] ———, *Introduction to multigrid methods*, Nieuw Archief voor Wiskunke, 3 (1981), pp. 71–101.
- [1615] ———, *Extensions of the defect correction principle*, in An Introduction to Computational and Asymptotic Methods for Boundary and Interior Layers, J. J. H. Miller, ed., Short Course, Boole Press, Dublin, 1982, pp. 33–45.
- [1616] ———, *Mixed defect correction iteration for the accurate solution of the convection diffusion equation*, in Multigrid Methods, W. Hackbusch and U. Trottenberg, eds., vol. 960 of Lecture Notes in Mathematics, Berlin, 1982, Springer–Verlag, pp. 485–501.
- [1617] ———, *A note on defect correction processes with an approximate inverse of deficient rank*, Appl. Math. Comput., 8 (1982), pp. 137–139.
- [1618] ———, *Numerical aspects of singular perturbation problems*, in Asymptotic Analysis II, F. Verhulst, ed., vol. 985 of Lecture Notes in Mathematics, Springer–Verlag, Berlin, 1982, pp. 267–287.
- [1619] ———, *On the comparison of Line–Gauss–Seidel and ILU relaxation in multigrid algorithms*, in Computational and Asymptotic Methods for Boundary and Interior Layers, J. J. H. Miller, ed., Dublin, 1982, Boole Press, pp. 269–277.
- [1620] ———, *Multigrid methods for problems with a small parameter in the highest derivative*, in Numerical Analysis, G. A. Watson, ed., vol. 1066 of Lecture Notes in Mathematics, Springer–Verlag, Berlin, 1983, pp. 106–121.
- [1621] ———, *The use of defect correction for the solution of a singularly perturbed ODE*, in Proceedings of the Third Conference on the Numerical Treatment of Ordinary Differential Equations, R. März, ed., Berlin, 1983, Humboldt Universität, pp. 91–104.
- [1622] ———, *Mixed defect correction iteration for the solution of a singular perturbation problem*, in Defect Correction Methods: Theory and Applications, K. Böhmer and H. J. Stetter, eds., Computing Suppl. 5, Springer–Verlag, Vienna, 1984, pp. 123–145.
- [1623] ———, *Multigrid algorithms run on supercomputers*, Supercomputer, 4 (1984), pp. 44–51.
- [1624] ———, *Multigrid methods for problems with a small parameter in the highest derivative*, in Numerical Analysis, Proceedings, Dundee 1983, vol. 1066 of Lecture Notes in Mathematics, Berlin, 1984, Springer–Verlag, pp. 106–121.
- [1625] ———, *Defect correction and higher order schemes for the multigrid solution of the steady Euler equations*, in Multigrid Methods II, W. Hackbusch and U. Trottenberg, eds., Berlin, 1986, Springer–Verlag, pp. 149–165.
- [1626] ———, *Multigrid and improved accuracy for the Euler equations*, in Discretization in Differential Equations and Enclosures, E. Adams, R. Ansorge, C. Grossmann, and H.-G. Roos, eds., Berlin, 1987, Akademie–Verlag.
- [1627] ———, *A multigrid approach for one-dimensional semiconductor device simulation*, in Device Simulation –Numerische Problemfelder–, W. Joppich and U. Trottenberg, eds., vol. 144 of GMD-Studien, Bonn, 1988, GMD.
- [1628] ———, *A nonlinear multigrid method for one-dimensional semiconductor device simulation*, in BAIL V, Proceedings of the Fifth International Conference on Boundary and Interior Layers, Shanghai, Guo Ben-Yu, J. J. H. Miller, and Shi Zhong-ci, eds., Dublin, 1988, Boole Press.
- [1629] ———, *Nonlinear multigrid method for one-dimensional semiconductor device simulation: results for the diode*, J. Comput. Appl. Math., 30 (1990), pp. 117–126.
- [1630] ———, *On the order of prolongations and restrictions in multigrid procedures*, J. Comput. Appl. Math., 32 (1990), pp. 423–429.
- [1631] ———, *Sparse-grid finite-volume multigrid for 3D-problems*, Adv. Comput. Math., 4 (1995), pp. 83–110.
- [1632] P. W. HEMKER AND P. M. DE ZEEUW, *Defect correction for the solution of a singular perturbation problem*, in Scientific Computing, R. S. Stepleman, ed., North–Holland, Amsterdam, 1983, pp. 113–118.
- [1633] ———, *Some implementations of multigrid linear system solvers*, in Multigrid Methods for Integral and Differential Equations, D. J. Paddon and H. Holstein, eds., vol. 3 of The Institute of Mathematics and its Applications Conference Series, Clarendon Press, Oxford, 1985, pp. 85–116.
- [1634] P. W. HEMKER AND G. M. JOHNSON, *Multigrid approaches to the Euler equations*, in Multigrid Methods, S. F. McCormick, ed., vol. 3 of Frontiers in Applied Mathematics, SIAM, Philadelphia, 1987, pp. 57–72.

- [1635] P. W. HEMKER, R. KETTLER, P. WESSELING, AND P. M. DE ZEEUW, *Multigrid methods: development of fast solvers*, Appl. Math. Comput., 13 (1983), pp. 311–326.
- [1636] P. W. HEMKER AND B. KOREN, *Multigrid, defect correction and upwind schemes for the steady Navier–Stokes equations*, in Numerical Methods for Fluid Dynamics III, K. W. Morton and M. J. Baines, eds., Oxford, 1988, Clarendon Press, pp. 153–170.
- [1637] ———, *A non-linear multigrid method for the steady Euler equations*, in Numerical Simulation of Compressible Euler Flows, A. Dervieux, B. Leer, J. Périoux, and A. Rizzi, eds., vol. 26 of Notes on Numerical Fluid Mechanics, Vieweg, Braunschweig, 1989, pp. 175–196.
- [1638] P. W. HEMKER, B. KOREN, AND J. NOORDMANS, *3D multigrid on partially ordered sets of grids*, in Multigrid Methods V, vol. 3 of Lecture Notes in Computational Science and Engineering, Berlin, 1998, Springer, pp. 105–124.
- [1639] P. W. HEMKER, B. KOREN, AND S. P. SPEKREIJSE, *A nonlinear multi-grid method for the efficient solution of the steady Euler equations*, in Tenth International Conference on Numerical Methods in Fluid Dynamics, F. G. Zhuang and Y. L. Zhu, eds., vol. 264 of Lecture Notes in Physics, Berlin, 1986, Springer–Verlag, pp. 308–313.
- [1640] P. W. HEMKER AND J. MOLENAAR, *An adaptive multigrid approach for the solution of the 2D semiconductor equations*, in Multigrid Methods III, W. Hackbusch and U. Trottenberg, eds., vol. 98 of International Series of Numerical Mathematics, Basel, 1991, Birkhäuser Verlag, pp. 41–60.
- [1641] P. W. HEMKER AND H. SCHIPPERS, *Multiple grid methods for the solution of Fredholm integral equations of the second kind*, Math. Comp., 36 (1981), pp. 215–232.
- [1642] P. W. HEMKER AND S. P. SPEKREIJSE, *Multigrid solutions of the steady Euler equations*, in Advances in Multi–Grid Methods, D. Braess, W. Hackbusch, and U. Trottenberg, eds., vol. 11 of Notes on Numerical Fluid Mechanics, Braunschweig, 1984, Vieweg, pp. 33–44.
- [1643] ———, *Multiple grid and Oscher’s scheme for the efficient solution of the steady Euler equations*, Appl. Numer. Math., 2 (1986), pp. 458–476.
- [1644] P. W. HEMKER AND P. WESSELING, *Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993*, vol. 116 of ISNM, Birkhäuser, Basel, 1994.
- [1645] P. W. HEMKER, P. WESSELING, AND P. M. DE ZEEUW, *A portable vector–code for autonomous multigrid modules*, in Proc. IFIP–Conference on PDE Software: Modules, Interfaces and Systems, B. Enquist and T. Smedsass, eds., Amsterdam, 1984, North–Holland, pp. 29–40.
- [1646] L. HEMMINGSSON, *A domain decomposition method for hyperbolic problems in 2D*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North–Holland), Amsterdam, 1995, pp. 373–388.
- [1647] L. HEMMINGSSON-FRANDEN AND A. WATHEN, *A nearly optimal preconditioner for the Navier–Stokes equations*, Numer. Lin. Alg. Appl., 8 (2001), pp. 229–243.
- [1648] R. HEMPEL, *Parallel black box multigrid*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 2, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 167–180.
- [1649] R. HEMPEL, R. CALKIN, R. HESS, W. JOPPICH, C. W. OOSTERLEE, H. RITZDORF, P. WYPIOR, W. ZIEGLER, N. KOIKE, T. WASHIO, AND U. KELLER, *Real applications on the new parallel system NEC Cenju-3*, Parallel Comput., 22 (1996), pp. 131–148.
- [1650] R. HEMPEL AND M. LEMKE, *Parallel black box multigrid*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 255–272.
- [1651] R. HEMPEL AND C. P. THOMPSON, *A note on the vectorization of algebraic multigrid algorithms*, Appl. Math. Comput., 26 (1988), pp. 245–256.
- [1652] R. HENDERSON AND G. E. KARNIADAKIS, *Hybrid spectral element methods for flows over rough walls*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 485–497.
- [1653] F. HENNEZEL, *Domain decomposition method with nonsymmetric interface operator*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 37–47.
- [1654] V. E. HENSON, *Parallel compact symmetric ffts*, in Vector and Parallel Computing: issues in applied research and development, Ellis Horwood Ltd. (John Wiley & Sons), Chichester, 1989, pp. 153–164.

- [1655] V. E. HENSON AND A. W. SHAKER, *Multigrid methods for a semilinear PDE in the theory of pseudoplastic fluids*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 231–242.
- [1656] R. HERBIN, S. GERBI, AND V. SONNAD, *Parallel implementation of a multigrid method on the experimental ICAP supercomputer*, Appl. Math. Comput., 27 (1988), pp. 281–312.
- [1657] J. C. HERINRICH, P. S. HYAKORN, A. R. MITCHELL, AND O. C. ZIENKIEWICZ, *An upwind finite element scheme for two-dimensional convective transport equations*, Int. J. Numer. Engng., 11 (1977), pp. 131–143.
- [1658] G. T. HERMAN, *Image Reconstruction From Projections, The Fundamentals of Computerized Tomography*, New York, 1980.
- [1659] G. T. HERMAN, H. LEVKOWITZ, S. F. MCCORMICK, AND H. TUY, *Multigrid image reconstruction*, in Proc. Workshop on Multilevel Image Processing and Analysis, A. Rosenfeld, ed., Berlin, 1983, Springer–Verlag.
- [1660] M. A. HEROUX, *The Fast Adaptive Composite Method for Time Dependent Problems*, PhD thesis, Colorado State University, Ft. Collins, 1989.
- [1661] M. A. HEROUX, S. F. MCCORMICK, S. MCKAY, AND J. W. THOMAS, *Applications of the fast adaptive composite grid method*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 251–265.
- [1662] M. A. HEROUX AND J. W. THOMAS, *TDFAC: A composite grid method for time dependent problems*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 273–285.
- [1663] ———, *TDFAC: a composite grid method for time dependent problems*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 2, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 181–202.
- [1664] ———, *A comparison of FAC and PCG methods for solving composite grid problems*, Comm. Appl. Num. Methods, 8 (1992), pp. 573–583.
- [1665] J. L. HERRING AND C. CHRISTOPOULOS, *Multigrid transmission line modelling method for solving electromagnetic field problems*, Electron. Lett., 27 (1991), pp. 1794–1795.
- [1666] ———, *The use of graded and multigrid techniques in transmission line modelling*, in Second International Conference on Computation in Electromagnetics, 1994, pp. 142–145.
- [1667] K. A. HESSINIUS AND M. M. RAI, *Three dimensional, conservative, Euler computations using patched grid systems and explicit methods*, AIAA, 86–1081 (1986).
- [1668] M. R. HESTENES, *The conjugate gradient method for solving linear systems*, in Proceedings of the Symposium on Applied Mathematics VI, American Mathematical Society, New York, 1956, McGraw–Hill, pp. 83–102.
- [1669] M. R. HESTENES AND E. STIEFEL, *Methods of conjugate gradients for solving linear systems*, J. Res. Nat. Bur. Stand., 49 (1952), pp. 409–436.
- [1670] J. S. HESTHAVEN, *A stable spectral multi-domain method for the unsteady, compressible Navier–Stokes equations*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 121–129.
- [1671] N. HEUER, *Preconditioners for the boundary element method in three dimensions*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 130–138.
- [1672] V. HEUVELINE AND C. BERTSCH, *On multigrid methods for the eigenvalue computation of nonselfadjoint elliptic operators*, E. W. J. Numer. Anal., 8 (2000), pp. 275–297.
- [1673] A. HIMANSU AND S. G. RUBIN, *Multigrid acceleration of a relaxation procedure for the reduced Navier Stokes equations*, AIAA J., 26 (1988), pp. 1044–1051.
- [1674] M. HINATSU AND J. H. FERZIGER, *Numerical computation of unsteady incompressible flow in complex geometry using a composite multigrid technique*, Int. J. Numer. Meth. Fluids, 13 (1991), pp. 971–997.
- [1675] R. HIPTMAIR, *Multilevel Preconditioning for Mixed Problems in Three Dimensions*, PhD thesis, Technischen Universität Augsburg, Augsburg, Germany, 1996.
- [1676] ———, *Multilevel Preconditioning for Mixed Problems in Three Dimensions*, vol. 8 of Augsburger mathematisch–naturwissenschaftliche Schriften, Wissner–Verlag, Augsburg, 1996.
- [1677] ———, *Multigrid method for $H(\text{div})$ in three dimensions*, Elec. Trans. Numer. Anal., 6 (1997), pp. 133–152.
- [1678] ———, *Canonical construction of finite elements*, Math. Comp., 68 (1999), pp. 1325–1346.

- [1679] ———, *Multigrid method for Maxwell's equations*, SIAM J. Numer. Anal., 36 (1999), pp. 204–225.
- [1680] R. HIPTMAIR AND R. H. W. HOPPE, *Mixed finite element discretization of continuity equations arising in semiconductor device simulation*, in Proceedings of a Conference held at the Mathematisches Forschungsinstitut Oberwolfach, July 5–11, 1992, R. E. Bank, R. Bulirsch, H. Gajewski, and K. Merten, eds., 1993, pp. 197–217.
- [1681] ———, *Multilevel preconditioning for mixed problems in three dimension*, Numer. Math., 82 (1999), pp. 253–279.
- [1682] R. HIPTMAIR, R. H. W. HOPPE, AND B. WOHLMUTH, *Coupling problems in microelectronic device simulation*, in 11th GAMM Seminar Kiel, W. Hackbusch and G. Wittum, eds., vol. 51 of Notes on Numerical Fluid Mechanics, Braunschweig, 1995, 11th GAMM Sem. Kiel, Vieweg, pp. 86–95.
- [1683] R. HIPTMAIR, T. SCHIEKOFER, AND B. WOHLMUTH, *Multilevel preconditioned augmented Lagrangian techniques for 2nd order mixed problems*, Computing, 57 (1996), pp. 25–48.
- [1684] Y. H. HO AND B. LAKSHMINARAYANA, *Computation of unsteady viscous flow using a pressure based algorithm*, AIAA J., 31 (1993), pp. 2232–2240.
- [1685] R. HOEKEMA, J. J. STRUIJK, C. H. VERNER, E. V. GOODALL, AND J. HOLSHIMER, *Calculation of the potential field in nerve stimulation using a multigrid method*, in Proceedings of the Annual Conference on Engineering in Medicine and Biology, vol. 15, Piscataway, NJ, 1993, IEEE, pp. 1200–1201.
- [1686] M. HOEKSTRA, *Computation of steady viscous flow near a ship's stern*, in Research in Numerical Fluid Mechanics, P. Wesseling, ed., vol. 17 of Notes on Numerical Fluid Mechanics, Braunschweig, 1987, Vieweg, pp. 45–57.
- [1687] K.-H. HOFFMANN AND J. ZOU, *Parallel algorithms of Schwarz variant for variational inequalities*, Num. Funct. Anal. Opt., 13 (1992), pp. 449–462.
- [1688] ———, *Parallel efficiency of domain decomposition methods*, Parallel Comput., 19 (1993), pp. 1375–1391.
- [1689] J. HOFFREN, T. SIIKONEN, AND S. LAINE, *Conservative multiblock Navier–Stokes solver for arbitrarily deforming geometries*, J. Aircraft, 32 (1995), pp. 1342–1350.
- [1690] F. HOFMANN, W. HÄNDLER, J. BOLKERT, W. HENNING, AND G. FRITSCH, *Multiprocessor-Architekturkonzept für Mehrgitterverfahren*, in Rechnerarchitekturen für die numerische Simulation auf der Basis superschneller Lösungsverfahren I, U. Trottenberg and P. Wypior, eds., GMD-Studien Nr. 88, Gesellschaft für Mathematik und Datenverarbeitung, St. Augustin, 1984, pp. 65–76.
- [1691] G. HOFMANN, *Analysis of a SOR-like multi-grid algorithm for eigenvalue problems*, in Advances in Multi–Grid Methods, D. Braess, W. Hackbusch, and U. Trottenberg, eds., vol. 11 of Notes on Numerical Fluid Mechanics, Braunschweig, 1984, Vieweg, pp. 45–57.
- [1692] ———, *Analyse eines Mehrgitterverfahrens zur Berechnung von Eigenwerten elliptischer Differentialoperatoren*, PhD thesis, Universität Kiel, 1985.
- [1693] G. J. HOGENSON AND W. P. REINHARDT, *Variational upper and lower bounds on quantum free energy and energy differences via path integral Monte Carlo*, J. Chem. Phys., 102 (1995), pp. 4151–4159.
- [1694] J. P. HOLLAND, *A multigrid-based solution technique for incompressible flow*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 286–298.
- [1695] ———, *A multigrid-based solution technique for incompressible flow*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 3, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 1–15.
- [1696] W. HOLLAND, S. F. MCCORMICK, AND J. W. RUGE, *Unigrid methods for boundary value problems with nonrectangular domains*, J. Comput. Phys., 48 (1982), pp. 412–422.
- [1697] ———, *Unigrid methods for boundary value problems with nonrectangular domains*, in Multigrid Methods, H. Lomax, ed., NASA Conference Publication 2202, Ames Research Center, Moffett Field, CA, 1982, pp. 235–247.
- [1698] M. J. HOLST, *Multilevel methods for the Poisson–Boltzmann equation*, PhD thesis, University of Illinois, Urbana–Champaign, 1993.
- [1699] M. J. HOLST, R. KOZACK, F. SAIED, AND S. SUBRAMANIAM, *Treatment of electrostatic effects in protein: Multigrid–based–Newton iterative method for solution of the full nonlinear Poisson–Boltzmann equation*, Protein: Structure, Function, and Genetics, 18 (1994), pp. 231–245.
- [1700] M. J. HOLST AND F. SAIED, *Multigrid solution of the Poisson Boltzmann equation*, J. Com-

- put. Chem., 14 (1993), pp. 105–113.
- [1701] ———, *Multigrid and domain decomposition methods for electrostatics problems*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 231–238.
- [1702] ———, *Numerical solution of the nonlinear Poisson Boltzmann equation: developing more robust and efficient methods*, J. Comput. Chem., 16 (1995), pp. 337–364.
- [1703] M. J. HOLST AND S. VANDERWALLE, *Schwarz methods: To symmetrize or not to symmetrize*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 363–378.
- [1704] H. HOLSTEIN AND G. PAPAMANOLIS, *A multigrid treatment of stream function normal derivative boundary conditions*, in Advances in Multi-Grid Methods, D. Braess, W. Hackbusch, and U. Trottenberg, eds., vol. 11 of Notes on Numerical Fluid Mechanics, Braunschweig, 1985, Vieweg, pp. 58–63.
- [1705] W. H. HOLTER, *A vectorized multigrid solver for the three-dimensional Poisson equation*, in Supercomputer Applications, A. H. L. Emmen, ed., North-Holland, Amsterdam, 1985, pp. 17–32.
- [1706] ———, *A vectorized multigrid solver for the three-dimensional Poisson equation*, Appl. Math. Comput., 19 (1986), pp. 127–144.
- [1707] M. HOLZRICHTER AND S. OLIVEIRA, *A graph based Davidson algorithm for the graph partitioning problem*, Int. J. Found. Comp. Sci., 10 (1999), pp. 225–247.
- [1708] R. HONGXIN, *Parallel domain decomposition algorithm with mixed finite element for elliptic problems*, Wuhan U. J. Nat. Sci., 1 (1996), pp. 680–685.
- [1709] C. J. HOOGENDOORN AND T. H. MEER, *Convection-diffusion phenomena and a Navier-Stokes processor*, in Research in Numerical Fluid Mechanics, P. Wesseling, ed., vol. 17 of Notes on Numerical Fluid Mechanics, Braunschweig, 1987, Vieweg, pp. 58–72.
- [1710] J. J. HOPFIELD, *Neural networks and physical systems with emergent collective computational abilities*, Proc. Natl. Acad. Sci., USA, 79 (1982), pp. 2554–2558.
- [1711] H. HOPPE AND H. MUHLENBEIN, *Parallel adaptive full-multigrid methods on message-based multiprocessors*, Parallel Comput., 3 (1986), pp. 269–287.
- [1712] R. H. W. HOPPE, *Multigrid algorithms for variational inequalities*, SIAM J. Numer. Anal., 24 (1987), pp. 1046–1065.
- [1713] ———, *On the numerical solution of variational inequalities by multi-grid techniques*, in Proceedings of the International Symposium on Numerical Analysis, Ankara, Turkey, 1987, Middle East Technical University, pp. 59–87.
- [1714] ———, *Two-sided approximations for unilateral variational inequalities by multigrid methods*, Optimization, 18 (1987), pp. 867–881.
- [1715] ———, *Une méthode multigrille pour la solution des problèmes d'obstacle*, M2 AN, 24 (1990), pp. 711–736.
- [1716] R. H. W. HOPPE AND R. KORNHUBER, *Multigrid methods for the two-phase Stefan problem*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 267–297.
- [1717] ———, *Multi-grid solution of two coupled Stefan equations arising in induction heating of large steel slabs*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 3, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 19–57.
- [1718] ———, *Multilevel preconditioned cg-iterations for variational inequalities*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 1, Denver, 1991, University of Colorado, pp. 67–84.
- [1719] ———, *Adaptive multilevel-methods for obstacle problems*, SIAM J. Numer. Anal., 31 (1994), pp. 301–323.
- [1720] R. H. W. HOPPE AND B. WOLMUTH, *Efficient numerical solution of mixed finite element discretizations by adaptive multilevel methods*, Appl. Math., 40 (1995), pp. 227–248.
- [1721] G. HORTON, *Time-parallel multigrid solution to the Navier-Stokes equations*, in Applications of Supercomputers in Engineering, C. Breddo, ed., Elsevier, Amsterdam, 1991.
- [1722] ———, *The time-parallel multigrid method*, Comm. Appl. Num. Methods, 8 (1992), pp. 585–595.
- [1723] G. HORTON AND R. KNIRSCH, *A space- and time-parallel multigrid method for time-*

- dependent partial differential equations*, in Parallel Computing: From Theory to Sound Practice, W. Joosen and E. Milgrams, eds., IOS Press, Amsterdam, 1992.
- [1724] ———, *A time-parallel multigrid-extrapolation method for parabolic partial differential equations*, Parallel Comput., 18 (1992), pp. 21–29.
- [1725] G. HORTON, R. KNIRSCH, AND G. WITTUM, *Modification of the ILU-methd for enhanced parallel efficiency*, in Incomplete Decompositions (ILU) – Algorithms, Theory, and Applications, W. Hackbusch and G. Wittum, eds., vol. 41 of Notes on Numerical Fluid Mechanics, Braunschweig, 1993, Vieweg, pp. 57–66.
- [1726] G. HORTON AND S. T. LEUTENEGGER, *A multi-level solution algorithm for steady-state Markov chains*, Perform. Eval. Rev., 22 (1994), pp. 191–200.
- [1727] G. HORTON AND S. VANDEWALLE, *A space time multigrid method for parabolic partial differential equations*, SIAM J. Sci. Comput., 16 (1995), pp. 848–864.
- [1728] G. HORTON, S. VANDEWALLE, AND P. WORLEY, *An algorithm with polylog parallel complexity for solving parabolic partial differential equations*, SIAM J. Sci. Comput., 16 (1995), pp. 531–541.
- [1729] M. H. L. HOUNJET, *Field panel/finite difference method for potential unsteady transonic flow*, AIAA J., 23 (1985).
- [1730] C. E. HOUSTIS, E. N. HOUSTIS, AND J. R. RICE, *Partitioning PDE computations: Methods and performance evaluation*, Parallel Comput., 5 (1987), pp. 141–163.
- [1731] E. N. HOUSTIS, J. R. RICE, N. P. CHRISOCHOIDES, H. C. KARATHANASIS, P. N. PAPACHIOU, M. K. SAMARTZIS, E. A. VAVALIS, K. Y. WANG, AND S. WEERAWARANA, *ELLPACK: A numerical simulation programming environment of parallel MIMD machines*, in Supercomputing 90, J. Sopka, ed., ACM Press, New York, 1990, pp. 97–107.
- [1732] P. J. HOUWEN, *On the time integration of parabolic differential equations*, in Numerical Analysis, G. A. Watson, ed., vol. 912 of Lecture Notes in Mathematics, Berlin, 1982, Springer-Verlag, pp. 157–168.
- [1733] P. J. HOUWEN AND H. B. VRIES, *Preconditioning and coarse grid corrections in the solution of the initial value problem for nonlinear partial differential equations*, SIAM J. Sci. Stat. Comput., 3 (1982), pp. 473–485.
- [1734] L. H. HOWELL, *A multilevel adaptive projection method for unsteady incompressible flow*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 243–257.
- [1735] F. A. HOWES, *Perturbed boundary value problems whose reduced solutions are nonsmooth*, Indiana Univ. Math. J., 30 (1981), pp. 267–280.
- [1736] A. N. HRYMAK, G. J. MCRAE, AND A. W. WESTERBERG, *An implementation of a moving finite element method*, J. Comput. Phys., 63 (1986), pp. 168–190.
- [1737] G. C. HSIAO, *The coupling of BEM and FEM – a brief review*, in Boundary Elements X, C. A. Brebbia, ed., vol. 1, Springer-Verlag, Berlin, Heidelberg, New York, 1988, pp. 431–445.
- [1738] ———, *The coupling of boundary element and finite element methods*, Z. Angew. Math. Mech., 70, no. 6 (1990), pp. T493–T503.
- [1739] G. C. HSIAO, M. D. MARCOZZI, AND S. ZHANG, *An efficient computational method for the flow past an airfoil*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 497–502.
- [1740] G. C. HSIAO AND W. L. WENDLAND, *A finite element method for some integral equations of the first kind*, J. Math. Anal. Appl., 58 (1977), pp. 449–481.
- [1741] ———, *On a boundary integral equation method for some exterior problems in elasticity*, in Proceedings of Tbilisi University, J. Sharikadze, ed., vol. 257, Tbilisi Univ. Press, 1985, pp. 31–60.
- [1742] ———, *Domain decomposition in boundary element methods*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 41–49.
- [1743] ———, *Domain decomposition via boundary element methods*, in Numerical Methods in Engineering and Applied Sciences Part I, CIMNE, Barcelona, 1992, pp. 198–207.
- [1744] C.-H. HSU AND R.-T. LEE, *Advanced multilevel solution for elastohydrodynamic lubrication circular contact problem*, Wear, 177 (1994), pp. 117–127.
- [1745] ———, *Efficient algorithm for thermal elastohydrodynamic lubrication under rolling/sliding line contacts*, J. Tribol. Trans. ASME, 116 (1994), pp. 762–769.

- [1746] L.-C. HSU AND C. MAVRIPLIS, *Adaptive meshes for the spectral element method*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 374–381.
- [1747] J. HU, *Cache Based Multigrid on Unstructured Grids in Two and Three Dimensions*, PhD thesis, University of Kentucky, Department of Mathematics, Lexington, KY, 2000.
- [1748] Y. F. HU, R. J. BLAKE, J. PEIRO, J. PERAIRE, AND K. MORGAN, *Partitioning and scheduling algorithms and their implementation in FELISA – an unstructured grid solver*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North-Holland), Amsterdam, 1995, pp. 225–232.
- [1749] Y. F. HU, D. R. EMERSON, AND R. J. BLAKE, *The communication performance of the Cray T3D and its effect on iterative solvers*, Parallel Comput., 22 (1996), pp. 829–844.
- [1750] Q. HUAN, S. LELLIN, G. HANPING, AND T. YIQUN, *Asynchronous parallel algorithm based on DDM for solving some nonlinear PDE's*, Wuhan U. J. Nat. Sci., 1 (1996), pp. 675–679.
- [1751] G. M. HUANG AND S. ZHU, *New HAD algorithm for optimal routing of hierarchically structured data networks*, IEEE Trans. Paral. Distrib. Sys., 7 (1996), pp. 939–953.
- [1752] H.-C. HUANG AND R. W. LEWIS, *Generalized multigrid approaches to nonlinear transient thermal problems*, Comm. Appl. Numer. Meth., 4 (1988), pp. 343–348.
- [1753] J. HUANG, *Chaotic iterative methods by space decomposition and subspace correction*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 65–72.
- [1754] W. Z. HUANG, *Convergence of algebraic multigrid methods for symmetric positive definite matrices with weak diagonal dominance*, Appl. Math. Comput., 46 (1991), pp. 145–164.
- [1755] Y. HUANG, *A multigrid method for solution of vorticity–velocity form of 3-D Navier–Stokes equations*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 2, Denver, 1991, University of Colorado, pp. 23–60.
- [1756] Y. HUANG AND U. GHIA, *A multigrid method for solution of vorticity–velocity form of 3-D Navier–Stokes equations*, Comm. Appl. Num. Methods, 8 (1992), pp. 707–719.
- [1757] Z. HUANG, *A multi-grid algorithm for mixed problems with penalty*, Numer. Math., 57 (1990), pp. 227–247.
- [1758] ———, *A multi grid algorithm for Stokes problem*, J. Comput. Math., 13 (1995), pp. 291–305.
- [1759] T. HUCKLE, *Fast transforms for tridiagonal linear equations*, BIT, 34 (1994), pp. 99–112.
- [1760] T. J. R. HUGHES AND R. M. FERENCZ, *Fully vectorized EBE preconditioners for nonlinear solid mechanics: applications to large-scale three-dimensional continuum, shell and contact/impact problems*, in First International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. Périaux, eds., Philadelphia, 1988, SIAM, pp. 261–280.
- [1761] T. J. R. HUGHES, R. M. FERENCZ, AND J. O. HALLQUIST, *Large-scale vectorized implicit calculations in solid mechanics on a Cray X-MP/48 utilizing EBE preconditioned conjugate gradients*, Comp. Meth. Appl. Mech. Engng., 61 (1987), pp. 215–248.
- [1762] T. J. R. HUGHES, I. LEVIT, AND J. WINGET, *An element-by-element solution algorithm for problems of structural and solid mechanics*, Comp. Meth. Appl. Mech. Engng., 36 (1983), pp. 241–254.
- [1763] T. J. R. HUGHES, J. WINGET, I. LEVIT, AND T. E. TEZDUYAR, *New alternating direction procedures in finite element analysis based upon EBE approximate factorization*, in Computer Methods for Nonlinear Solids and Mechanics, ASME, New York, 1983, pp. 75–109.
- [1764] A. HULSEBOS, *Gribov copies and other gauge fixing beasties on the lattice*, Nucl. Phys. B, Proc. Suppl., 30 (1993), pp. 539–542.
- [1765] A. HULSEBOS, M. L. LAURSEN, AND J. SMIT, *SU(N) multigrid Landau gauge fixing*, Phys. Lett. B, 291 (1992), pp. 431–436.
- [1766] A. HULSEBOS, M. L. LAURSEN, J. SMIT, AND A. J. SIJS, *Multigrid Landau gauge fixing*, Nucl. Phys. B, Proc. Suppl., 20 (1991), pp. 98–101.
- [1767] A. HULSEBOS, J. SMIT, AND J. C. VINK, *Multigrid inversion of the staggered fermion matrix*, Nucl. Phys. B, Proc. Suppl., 20 (1991), pp. 94–97.
- [1768] ———, *Multigrid inversion of lattice fermion operators*, Nucl. Phys. B, B368 (1992), pp. 379–389.
- [1769] ———, *Multigrid inversion of the staggered fermion matrix with U(1) and SU(2) gauge fields*, in Workshop on Fermion Algorithms, HLRZ, KFA Jülich, Germany, 1991, H. J. Herrmann and F. Karsch, eds., Singapore, 1992, World Scientific, pp. 161–168.
- [1770] M. A. HULSEN AND J. ZANDEN, *Problems, analyses and solutions of the equations for vis-*

- coelastic flow*, in Research in Numerical Fluid Mechanics, P. Wesseling, ed., vol. 17 of Notes on Numerical Fluid Mechanics, Braunschweig, 1987, Vieweg, pp. 73–86.
- [1771] M. HUNEK, K. KOZEL, AND M. VAVRINCOVA, *Numerical solution of transonic potential flow in 2d compressor cascades using multi-grid techniques*, in Robust Multi-Grid Methods, W. Hackbusch, ed., vol. 23 of Notes on Numerical Fluid Mechanics, Braunschweig, 1989, Vieweg, pp. 145–154.
- [1772] R. HUNT, *Single-level multigrid*, J. Comp. Appl. Math., 23 (1988), pp. 133–139.
- [1773] B. R. HUTCHINSON, P. F. GALPIN, AND G. D. RAITHBY, *Application of additive correction multigrid to the coupled fluid flow equations*, Numer. Heat Transf., 13 (1988), pp. 133–147.
- [1774] A. HVIDSTEN, *A parallel implementation of the finite element program SESTRA*, PhD thesis, Department of Informatics, University of Bergen, Norway, 1990.
- [1775] S. H. HWANG AND S. U. LEE, *An optical flow estimation algorithm using the spatio temporal hierarchical structure*, IEICE Trans. Info. Sys., E76-D (1993), pp. 507–514.
- [1776] T. HWANG, S. KACOU, AND I. D. PARSONS, *Experiences with multigrid algorithms for III-conditioned structural mechanics problems*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 1, Denver, 1991, University of Colorado, pp. 237–250.
- [1777] ———, *Multigrid algorithms for solving structural mechanics problems on supercomputers*, Comput. Syst. Eng., 2 (1991), pp. 253–260.
- [1778] T. HWANG AND I. D. PARSONS, *Multigrid method for the generalized symmetric eigenvalue problem. Part I. Algorithm and implementation*, J. Numer. Meth. Engrg., 35 (1992), pp. 1663–1676.
- [1779] ———, *Multigrid method for the generalized symmetric eigenvalue problem. Part II. Algorithm and implementation*, J. Numer. Meth. Engrg., 35 (1992), pp. 1677–1696.
- [1780] ———, *Multigrid solution procedures for structural dynamics eigenvalue problems*, Comput. Mech., 10 (1992), pp. 247–262.
- [1781] ———, *Parallel implementation and performance of multigrid algorithms for solving eigenvalue problems*, Comput. Struct., 50 (1994), pp. 325–336.
- [1782] Y.-H. HWANG, *Unstructured additive correction multigrid method for the solution of matrix equations*, Numerical Heat Transfer, Part B: Fundamentals, 27 (1995), pp. 195–212.
- [1783] Y.-S. HWANG, R. DAS, AND J. H. SALZT, *Parallelizing molecular dynamics programs for distributed-memory machines*, IEEE Comput. Sci. Eng., 2 (1995), pp. 18–29.
- [1784] J. M. HYMAN, *Mesh refinement and local inversion of elliptic differential equations*, J. Comput. Phys., 23 (1977), pp. 124–134.
- [1785] ———, *Accurate monotonicity preserving cubic interpolation*, SIAM J. Sci. Stat. Comput., 4 (1983), pp. 645–654.
- [1786] C. S. IEROTHEOU, C. R. FORSEY, AND U. BLOCK, *Parallelisation of a novel 3D hybrid structured unstructured grid cfd production code*, in Proceedings of International Conference on High Performance Computing and Networking. HPCN '95 Milan, Italy, May 3–5, 1995, Berlin, 1995, Springer-Verlag, pp. 831–836.
- [1787] J. H. INDIK, R. A. INDIK, AND T. T. C. CETAS, *Fast and efficient computer modeling of ferromagnetic seed arrays of arbitrary orientation for hyperthermia treatment planning*, Int. J. Radiat. Oncol. Biol. Phys., 30 (1994), pp. 653–662.
- [1788] R. A. INDIK AND J. H. INDIK, *A new computer method to quickly and accurately compute steady state temperatures from ferromagnetic seed heating*, Med. Phys., 21 (1994), pp. 1135–1144.
- [1789] A. C. IRVING, *Finite size effects, scaling and algorithms for lattice $CP^{N=1}$* , Nucl. Phys. B, Proc. Suppl., 30 (1993), pp. 823–826.
- [1790] A. C. IRVING AND C. MICHAEL, *Finite size effects and scaling in lattice $CP^{N=1}$* , Phys. Lett. B, 292 (1992), pp. 392–396.
- [1791] A. ISERLES, *A First Course in the Numerical Analysis of Differential Equations*, Cambridge University Press, Cambridge, 1995.
- [1792] M. ISRAELI AND G. ENDEN, *A two-grid method for fluid dynamic problems with disparate time scales*, in Proceedings of the Ninth International Conference on Numerical Methods in Fluid Dynamics, Soubbaramayer and J. P. Boujot, eds., vol. 218 of Lecture Notes in Physics, Berlin, 1985, Springer-Verlag.
- [1793] M. ISRAELI AND M. ROSENFIELD, *Marching multigrid solutions to the parabolized Navier-Stokes equations*, in Proceedings of the Fifth GAMM Conference on Numerical Methods in Fluid Mechanics, vol. 7 of Notes on Numerical Fluid Mechanics, Braunschweig, 1983, Vieweg, pp. 137–145.
- [1794] ———, *Numerical solution of incompressible flows by a marching multigrid nonlinear*

- method*, AIAA, 85–1500 (1985).
- [1795] M. ISRAELI, L. VOZOVOI, AND A. AVERBUCH, *Parallelizing implicit algorithms for time dependent problems by parabolic domain decomposition*, J. Sci. Comput., 8 (1993), pp. 151–166.
- [1796] ———, *Spectral multidomain technique with local Fourier basis*, J. Sci. Comput., 8 (1993), pp. 135–149.
- [1797] ———, *Domain decomposition methods with local Fourier basis for parabolic problems*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 223–230.
- [1798] K. ITO, S. F. MCCORMICK, AND L. TEIJUN, *Multilevel Riccati solvers*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 2, Denver, 1991, University of Colorado, pp. 297–305.
- [1799] H. IWASE, N. KAMIYA, AND E. KITA, *Algorithms for boundary element parallel computing: convergency of solution*, J. Jpn. Soc. Simul. Technol., 15 (1996), pp. 187–193.
- [1800] S. R. K. IYENGAR AND A. GOYAL, *Comparison of S and V cycles in multigrid method for linear elliptic equations with variable coefficients*, Numer. Meth. for PDE, 8 (1992), pp. 113–125.
- [1801] K. A. IYER, M. P. MERRICK, AND T. L. BECK, *Application of a distributed nucleus approximation in grid based minimization of the Kohn Sham energy functional*, J. Chem. Phys., 103 (1995), pp. 227–233.
- [1802] J. J. E. DENDY AND J. D. MOULTON, *Some aspects of multigrid for mixed discretizations*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 80–86.
- [1803] D. A. H. JACOBS, *Some iterative methods: past, present, future*, in IEEE Colloquium on Numerical Solution Techniques for Large Sparse Systems of Equations, London, 1983.
- [1804] P. G. JACOBS, V. A. MOUSSEAU, P. R. MCHUGH, AND D. A. KNOLL, *Newton-Krylov-Schwarz techniques applied to the two-dimensional incompressible Navier-Stokes and energy equations*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 503–507.
- [1805] A. JAMESON, *Acceleration of transonic potential flow calculations on arbitrary meshes by the multiple grid method*, AIAA, 79-1458 (1979).
- [1806] ———, *Evolution of computational methods in aerodynamics*, J. Appl. Mech., 50 (1983), pp. 1052–1070.
- [1807] ———, *Solution of the Euler equations for two dimensional transonic flow by a multigrid method*, Appl. Math. Comput., 13 (1983), pp. 327–355.
- [1808] ———, *Numerical solution of the Euler equations for the compressible inviscid fluids*, in Numerical Methods for the Euler Equations of Fluid Dynamics, F. Angrand, A. Dervieux, J. A. Desideri, and R. Glowinski, eds., vol. 21 of Proceedings in Applied Mathematics, SIAM, Philadelphia, 1985, pp. 199–245.
- [1809] ———, *Transonic flow calculations for aircraft*, in Numerical Methods in Fluid Dynamics, F. Brezzi, ed., vol. 1127 of Lecture Notes in Mathematics, Springer-Verlag, Berlin, 1985.
- [1810] ———, *Multigrid algorithms for compressible flow calculations*, in Multigrid Methods II, W. Hackbusch and U. Trottenberg, eds., Berlin, 1986, Springer-Verlag, pp. 166–201.
- [1811] ———, *Computational transonics*, Comm. Pure Appl. Math., XLI (1988), pp. 507–549.
- [1812] ———, *Time dependent calculations using multigrid, with applications to unsteady flows past airfoils and wings*, AIAA, 91–1596 (1991).
- [1813] ———, *Computational algorithms for aerodynamic analysis and design*, Appl. Numer. Math., 13 (1993), pp. 383–422.
- [1814] A. JAMESON AND T. J. BAKER, *Multigrid solution of the Euler equations for aircraft configurations*, AIAA, 84-0093 (1984).
- [1815] A. JAMESON, W. SCHMIDT, AND E. TURKEL, *Numerical solutions of the Euler equations by finite volume methods using Runge-Kutta time-stepping schemes*, AIAA, 81-1259 (1981).
- [1816] A. JAMESON AND S. YOON, *Multigrid solution of the Euler equations using implicit schemes*, AIAA, 85-0293 (1985).
- [1817] W. JANKE AND T. SAUER, *Multicanonical multigrid Monte Carlo method*, Phys. Rev. E, Stat. Phys. Plasmas Fluids Relat. Interdiscip. Top., 49 (1994), pp. 3475–3479.
- [1818] ———, *Multicanonical multigrid Monte Carlo method and effective autocorrelation time*, Nucl. Phys. B, Proc. Suppl., 34 (1994), pp. 771–773.

- [1819] ———, *Application of the multicanonical multigrid Monte Carlo method to the two dimensional ϕ^4 -model: autocorrelations and interface tension*, J. Stat. Phys., 78 (1995), pp. 759–798.
- [1820] ———, *Monte Carlo simulation of 1+1-dimensional ϕ^4 quantum field theory*, Nucl. Phys. B, Proc. Suppl., 42 (1995), pp. 917–919.
- [1821] ———, *Test of variational approximation for ϕ^4 quantum chain by Monte Carlo simulation*, Phys. Lett. A, 197 (1995), pp. 335–340.
- [1822] J. JANSEN AND S. VANDEWALLE, *Multigrid waveform relaxation on spatial finite element meshes*, in Contributions to Multigrid, vol. 103 of CWI Tracts, Amsterdam, 1994, CWI, pp. 75–86.
- [1823] ———, *Multigrid waveform relaxation on spatial finite element meshes: the continuous-time case*, SIAM J. Numer. Anal., 33 (1996), pp. 456–474.
- [1824] ———, *Multigrid waveform relaxation on spatial finite element meshes: the discrete-time case*, SIAM J. Sci. Comput., 17 (1996), pp. 133–155.
- [1825] C. JAPHET, *Optimized Krylov-Ventcell method. application to convection-diffusion problems*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 382–389.
- [1826] B. JAWERTH AND W. SWELDENS, *Wavelet multiresolution analyses adapted for the fast solution of boundary value ordinary differential equations*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 259–273.
- [1827] D. C. JESPERSEN, *Multilevel techniques for nonelliptic problems*, in Multigrid Methods, H. Lomax, ed., NASA Conference Publication 2202, Ames Research Center, Moffett Field, CA, 1982, pp. 1–22.
- [1828] ———, *Design and implementation of a multigrid code for the Euler equations*, Appl. Math. Comput., 13 (1983), pp. 357–374.
- [1829] ———, *A multigrid method for the Euler equations*, AIAA, 83-0124 (1983).
- [1830] ———, *Multigrid methods for partial differential equations*, in Studies in Numerical Analysis, G. Golub, ed., MAA Studies in Mathematics, 1984, pp. 270–318.
- [1831] ———, *Recent developments in multigrid methods for the steady Euler equations*, in Lecture Notes for Lecture Series on Computational Fluid Dynamics, von Karman Institute for Fluid Dynamics, Rhode-St.-Genese, Belgium, 1984.
- [1832] ———, *A time-accurate multiple-grid algorithm*, AIAA, 85-1493-CP (1985).
- [1833] R. Q. JIA AND C. A. MICCHELLI, *Using the refinement equation for the construction of pre-wavelets*, in Curves and Surfaces, Academic Press, New York, 1991, pp. 209–246.
- [1834] X. Y. JIANG AND H. BUNKE, *Optimal implementation of morphological operations on neighborhood connected parallel computers*, Ann. Math. Artif. Intell., 13 (1995), pp. 301–315.
- [1835] Y. JIANG, C. P. CHEN, AND P. K. TUCKER, *Multigrid solution of unsteady Navier Stokes equations using a pressure method*, Numer. Heat Transf. A, Appl., 20 (1991), pp. 81–93.
- [1836] H. Q. JIN, *A note on best conditioned preconditioners*, BIT, 34 (1994), pp. 312–317.
- [1837] M. JIN, L. KANG, AND D. PENG, *Multi-agent parallel computational model based on DDM*, Wuhan U. J. Nat. Sci., 1 (1996), pp. 391–396.
- [1838] W. JIN-XIAN, *The parallel block preconditioned conjugate gradient algorithm*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 339–345.
- [1839] Z. JOHAN, K. K. MATHUR, S. L. JOHNSSON, AND T. J. R. HUGHES, *Scalability of finite element applications on distributed-memory parallel computers*, Comput. Meth. Appl. Mech. Engrg., 119 (1994), pp. 61–72.
- [1840] ———, *Parallel implementation of recursive spectral bisection on the Connection Machine CM-5 system*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North-Holland), Amsterdam, 1995, pp. 451–459.
- [1841] P. JOHANSSON, *A Three-Dimensional Laminar Multigrid Method Applied to the SIMLEC Algorithm*, PhD thesis, Chalmers University of Technology, Gothenberg, Sweden, 1992.
- [1842] P. JOHANSSON AND L. DAVIDSON, *A full multigrid method applied to turbulent flow using the SIMPLEC algorithm together with a collocated arrangement*, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6-9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 245–256.
- [1843] ———, *Modified collocated SIMPLEC algorithm applied to buoyancy affected turbulent flow using a multigrid solution procedure*, Numer. Heat Transf. B, Fundam., 28 (1995), pp. 39–57.
- [1844] C. JOHNSON, *Numerical Solution of Partial Differential Equations by the Finite Element*

- Method*, Cambridge University Press, Cambridge, 1987.
- [1845] G. M. JOHNSON, *Multiple-grid convergence acceleration of viscous and inviscid flow computation*, Appl. Math. Comput., 13 (1983), pp. 375–398.
- [1846] G. M. JOHNSON AND J. M. SWISHELM, *Multiple-grid solution of the three dimension Euler and Navier–Stokes equations*, in Proc. Ninth International Conference on Numerical Methods in Fluid Dynamics, Soubbararamayer and J. P. Boujot, eds., vol. 218 of Lecture Notes in Physics, Berlin, 1985, Springer–Verlag.
- [1847] G. M. JOHNSON, J. M. SWISHELM, AND S. P. KUMAR, *Concurrent processing adaptation of a multiple-grid algorithm*, AIAA, 85-1508-CP (1985).
- [1848] O. G. JOHNSON, C. A. MICCHELLI, AND G. PAUL, *Polynomial preconditioners for conjugate gradient calculations*, SIAM J. Numer. Anal., 20 (1983), pp. 362–376.
- [1849] B. W. JONES, K. McMANUS, M. CROSS, M. G. EVERETT, AND S. JOHNSON, *Parallel unstructured mesh CFD codes: a role for recursive clustering techniques in mesh decomposition*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North–Holland), Amsterdam, 1995, pp. 207–214.
- [1850] J. E. JONES, *A mixed finite volume element method for flow calculations in porous media*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 379–391.
- [1851] H. G. JOO AND T. J. DOWNAR, *Incomplete domain decomposition preconditioning for coarse mesh neutron diffusion problems*, in Proceedings of the International Conference, Mathematics and Computations, Reactor Physics, and Environmental Analyses 1995, vol. 2, La Grange Park, IL, 1995, American Nuclear Society, pp. 1584–1594.
- [1852] W. JOPPICH, *A multigrid algorithm with time dependent, locally refined grids for solving the nonlinear diffusion equation on a nonrectangular geometry*, Electrossoft, 1 (1990), pp. 253–261.
- [1853] ———, *A multigrid algorithm with time dependent, locally refined grids for solving the nonlinear diffusion equation on a nonrectangular geometry practical aspects*, COMPEL, Int. J. Comput. Math. Electr. Electron. Eng., 10 (1991), pp. 411–423.
- [1854] W. JOPPICH AND R. A. LORENTZ, *High order positive, monotone and convex multigrid interpolations*, COMPEL, Int. J. Comput. Math. Electr. Electron. Eng., 12 (1993), pp. 59–79.
- [1855] D. S. JOSHI AND S. P. VANKA, *Multigrid calculation procedure for internal flows in complex geometries*, Numer. Heat Transf. B, 20 (1991), pp. 61–80.
- [1856] JSCHÖBERL, *Robust multigrid preconditioning for parameter-dependent problems I: the Stokes case*, in Multigrid Methods V, vol. 3 of Lecture Notes in Computational Science and Engineering, Berlin, 1998, Springer, pp. 260–2275.
- [1857] C. JUHUA, X. SHENGWU, AND L. YUANXIANG, *Simulation of hydrodynamic phenomena by the Lattice–Boltzmann method*, Wuhan U. J. Nat. Sci., 1 (1996), pp. 696–700.
- [1858] G. JUNCU AND R. MIHAIL, *Multigrid solution of the diffusion-convection-reaction equations which describe the mass and/or heat transfer from or to a spherical particle*, Comput. Chem. Engng., 13 (1989), pp. 259–270.
- [1859] M. JUNG, *Convergence rates of multigrid methods for solving plane, linear elasticity problems*, in Second Multigrid Seminar, Garzau 1985, G. Telschow, ed., Berlin, 1986, Karl–Weierstrass–Institut, pp. 88–102. Report R–MATH–08/86.
- [1860] ———, *Finite element multi-grid package FEMGP (November 1985 version)*, in Second Multigrid Seminar, Garzau 1985, G. Telschow, ed., Berlin, 1986, Karl–Weierstrass–Institut, pp. 103–107. Report R–MATH–08/86.
- [1861] ———, *Konvergenzfaktoren von Mehrgitterverfahren für Probleme der ebenen linearen Elastizitätstheorie*, ZAMM, 67 (1987), pp. 165–173.
- [1862] ———, *On adaptive grids in multilevel methods*, in GAMM–Seminar on Multigrid–Methods, Gosen, Germany, September 21–25, 1992, S. Hengst, ed., Berlin, 1993, IAAS, pp. 67–80. Report No. 5.
- [1863] ———, *On the parallelization of multi-grid methods using a non-overlapping domain decomposition data structure*, Appl. Numer. Math., 23 (1997), pp. 119–137.
- [1864] ———, *Parallel multiplicative and additive multilevel methods for elliptic problems in three-dimensional domains*, in Advances in Computational Mechanics with Parallel and Distributed Processing, B. H. V. Topping, ed., Edinburgh, 1997, Civil–Comp Press, pp. 171–177. Proceedings of the EURO–CM–PAR97, Lochinver, April 28 – May 1, 1997.
- [1865] ———, *Parallel multi-level solvers for elliptic boundary value problems in three-dimensional domains*, in Multigrid Methods V, vol. 3 of Lecture Notes in Computational Science and Engineering, Berlin, 1998, Springer, pp. 125–139.
- [1866] M. JUNG AND U. LANGER, *Projection type multigrid methods for solving second-order elliptic*

- boundary value problems in plane domains with curved boundaries*, in Second Multigrid Seminar, Garzau 1985, G. Telschow, ed., Berlin, 1986, Karl-Weierstrass-Institut, pp. 63–87. Report R-MATH-08/86.
- [1867] ———, *Applications of multilevel methods to practical problems*, Surveys on Math. for Industry, 1 (1991), pp. 217–257.
- [1868] M. JUNG, U. LANGER, A. MEYER, W. QUECK, AND M. SCHNEIDER, *Multigrid preconditioners and their applications*, in Third Multigrid Seminar, Biesenthal 1988, G. Telschow, ed., Berlin, 1989, Karl-Weierstrass-Institut, pp. 11–52. Report R-MATH-03/89.
- [1869] M. JUNG, U. LANGER, AND U. SEMMLER, *Two-level hierarchically preconditioned conjugate gradient methods for solving linear elasticity finite element equations*, BIT, 29 (1989), pp. 748–768.
- [1870] M. JUNG AND J. F. MAITRE, *Some remarks on the constant in the strengthened CBS inequality: Estimate for hierarchical finite element discretizations of elasticity problems*, Numer. Meth. for PDE, 15 (1999), pp. 469–487.
- [1871] M. JUNG AND S. V. NEPOMNYASCHIKH, *Variable additive preconditioning procedures*, Computing, 62 (1999), pp. 109–128.
- [1872] M. JUNG AND U. RÜDE, *Implicit extrapolation methods for multilevel finite element computations*, SIAM J. Sci. Comput., 17 (1996), pp. 156–179.
- [1873] ———, *Implicit extrapolation methods for various coefficient problems*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 393–408.
- [1874] ———, *Implicit extrapolation methods for variable coefficient problems*, SIAM J. Sci. Comput., 19 (1998), pp. 1109–1124.
- [1875] S. JUNQIANG, S. ANXIANG, AND L. XIAOMEI, *Parallel computation of shallow-water model on workstation cluster*, Wuhan U. J. Nat. Sci., 1 (1996), pp. 522–525.
- [1876] S. JUNQIANG, W. XIANGJUN, AND L. XIAOMEI, *Parallel computing of the global spectral atmospheric model on the YH-2 supercomputer*, Wuhan U. J. Nat. Sci., 1 (1996), pp. 526–530.
- [1877] R. JYOTSNA AND S. P. VANKA, *A pressure based multigrid procedure for the Navier–Stokes equations on unstructured grids*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 409–424.
- [1878] S. KACOU AND I. D. PARSONS, *A parallel multigrid method for history dependent elastoplasticity computations*, Comput. Meth. Appl. Mech. Engrg., 108 (1993), pp. 1–21.
- [1879] V. M. KADYSHNIKOV AND V. M. LOSEV, *Performance evaluation of multigrid variants of a relaxation method for integrating prognostic equations by implicit schemes*, Meteorologiya i Gidrologiya, 3 (1994), pp. 29–38.
- [1880] M. KAHLERT, M. PAFFRATH, AND U. WEVER, *Scalability of industrial applications on different computer architectures*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 753–760.
- [1881] T. KALKREUTER, *Ground state projection multigrid for propagators in four dimensional $SU(2)$ gauge fields*, Phys. Lett. B, 276 (1992), pp. 485–491.
- [1882] ———, *Improving multigrid and conventional relaxation algorithms for propagators*, Int. J. Mod. Phys. C, Phys. Comput., 3 (1992), pp. 1323–1332.
- [1883] ———, *Projective block spin transformations in lattice gauge theories*, Nucl. Phys. B, B376 (1992), pp. 637–660.
- [1884] ———, *Idealized multigrid algorithm for staggered fermions*, Phys. Rev. D (Particles and Fields), 48 (1993), pp. 1926–1930.
- [1885] ———, *Multigrid for propagators of staggered fermions in four dimensional $SU(2)$ gauge fields*, Nucl. Phys. B, Proc. Suppl., 30 (1993), pp. 257–260.
- [1886] ———, *Multigrid methods for the computation of propagators in gauge fields*, Int. J. Mod. Phys. C, Phys. Comput., 5 (1994), pp. 629–700.
- [1887] ———, *Towards multigrid methods for propagators of staggered fermions with improved averaging and interpolation operators*, Nucl. Phys. B, Proc. Suppl., 34 (1994), pp. 768–770.
- [1888] ———, *Spectrum of the Dirac operator and inversion algorithms with dynamical staggered fermions*, Nucl. Phys. B, Proc. Suppl., 42 (1995), pp. 882–884.
- [1889] ———, *Spectrum of the Dirac operator and multigrid algorithm with dynamical staggered fermions*, Phys. Rev. D, Part. Fields, 51 (1995), pp. 1305–1313.
- [1890] T. KALKREUTER, G. MACK, AND M. SPEH, *Blockspin and multigrid for staggered fermions in non-Abelian gauge fields*, in Workshop on Fermion Algorithms, HLRZ, KFA Jülich, Germany, 1991, H. J. Herrmann and F. Karsch, eds., Singapore, 1992, World Scientific,

- pp. 121–147.
- [1891] M. KALTENBACHER AND S. REITZINGER, *Algebraic multigrid for solving electromechanical problems*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 129–135.
 - [1892] R. KAMINSKY, *Multilevel solution of the long transportation problem*, master's thesis, The Weizmann Institute of Science, Rehovot, Israel, 1989.
 - [1893] N. KAMIYA, H. IWASE, AND E. KITA, *Parallel adaptive boundary element analysis*, Comput. Meth. Appl. Mech. Eng., 134 (1996), pp. 341–350.
 - [1894] D. KAMOWITZ, *Theoretical and Experimental Results for a Variety of Multigrid Algorithms*, PhD thesis, University of Wisconsin, Madison, WI, 1986.
 - [1895] ———, *Experimental results for multigrid and transport problems*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 299–321.
 - [1896] D. KAMOWITZ AND S. V. PARTER, *A study of some multigrid ideas*, Appl. Math. Comput., 17 (1985), pp. 153–184.
 - [1897] J. KAN, C. VUIK, AND P. WESSELING, *Fast pressure calculation for 2D and 3D time dependent incompressible flow*, Num. Lin. Alg. with Appl., 7 (2000), pp. 429–447.
 - [1898] A. KANARACHOS AND N. PANTELELIS, *Block full multigrid adaptive scheme for the compressible Euler equations*, in Proceedings of the 13th Intl. Conf. on Numerical Methods in Fluid Dynamics, vol. 424 of Lecture Notes in Physics, 1993, pp. 265–269.
 - [1899] A. E. KANARACHOS AND N. G. PANTELELIS, *Multigrid scheme for the implicit solution of the compressible flow equations*, Comput. Mech., 14 (1994), pp. 235–248.
 - [1900] A. E. KANARACHOS, N. G. PANTELELIS, AND C. G. PROVATIDIS, *Recent developments in the algebraic multiblock method for Euler equations*, Comput. Meth. Appl. Mech. Engrg., 111 (1994), pp. 235–254.
 - [1901] A. E. KANARACHOS AND I. P. VOURNAS, *Multigrid technique for the compressible Euler and Navier–Stokes equations*, Eng. Comput., 10 (1993), pp. 123–137.
 - [1902] J. H. KANE, D. E. KEYES, AND K. G. PRASAD, *Iterative solution techniques in boundary element analysis*, Int. J. Numer. Meth. Engng., 31 (1991), pp. 1511–1536.
 - [1903] K. S. KANG AND D. Y. KWAK, *Convergence estimates for multigrid algorithms with Kaczmarz smoothing*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 227–232.
 - [1904] L. KANG, *Domain decomposition method and parallel algorithms*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 207–218.
 - [1905] L. KANG AND D. J. EVANS, *The convergence rate of the Schwarz alternating procedure (III) – for Neumann problems*, Int. J. Comput. Math., 21 (1987), pp. 85–108.
 - [1906] ———, *The convergence rate of the Schwarz alternating procedure (V) – for more than two subdomains*, Int. J. Comput. Math., 23 (1987).
 - [1907] Y. KANG AND S. R. FULTON, *Relaxation schemes for Chebyshev spectral multigrid methods*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 215–229.
 - [1908] D. KANNAN AND P. LU, *On the convergence of multigrid iteration scheme for mixed finite element equation*, Numer. Funct. Anal. Optim., 15 (1994), pp. 301–326.
 - [1909] E. KAPLAN, *A shallow water model distributed using domain decomposition*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 761–767.
 - [1910] A. KARAGEORGHIS AND T. N. PHILLIPS, *On efficient direct methods for conforming spectral domain decomposition techniques*, J. Comput. Appl. Math., 33 (1990), pp. 141–155.
 - [1911] A. KARLSSON AND L. FUCHS, *Fast and accurate solution of time-dependent incompressible flow*, in Numerical Methods in Laminar and Turbulent Flow, C. Taylor, J. A. Johnson, and W. R. Smith, eds., Swansea, 1983, Pineridge Press, pp. 606–616.
 - [1912] ———, *Multigrid solution of time-dependent incompressible flow*, in Proceedings of the Fifth GAMM Conference on Numerical Methods in Fluid Mechanics, vol. 7 of Notes on Numerical Fluid Mechanics, Braunschweig, 1983, Vieweg.
 - [1913] G. E. KARNIADAKIS, *Numerical simulation of heat transfer from a cylinder in crossflow*, Int. J. Heat Mass Transf., 31 (1988), p. 107.
 - [1914] G. E. KARNIADAKIS, B. B. MIKIC, AND A. T. PATERA, *Minimum-dissipation transport enhancement by flow destabilization: Reynolds' analogy revisited*, J. Fluid Dynamics, 192 (1988), p. 365.

- [1915] S. R. KARPIK AND W. R. PELTIER, *Multigrid methods for the solution of poisson's equation in a thick spherical shell*, SIAM J. Sci. Stat. Comput., 12 (1991), pp. 681–694.
- [1916] R. KASTNER AND Y. TWIG, *An “add on” analysis of large open circular cylindrical cavities*, IEEE Trans. Antennas Propag., 42 (1994), pp. 255–260.
- [1917] M. KATHONG, R. E. SMITH, AND S. N. TIWARI, *A conservative approach for flow field calculations on multiple grids*, AIAA, 88-0224 (1988).
- [1918] E. KATZER, *A Subspace Decomposition Two Grid Method for Hyperbolic Equations*, PhD thesis, Universität Kiel, Kiel, Germany, 1992.
- [1919] ———, *A parallel subspace decomposition method for hyperbolic equations*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 239–244.
- [1920] E. KAUCHER AND W. L. MIRANKER, *Residual correction and validation in functoids*, in Defect Correction Methods: Theory and Applications, K. Böhmer and H. J. Stetter, eds., Computing Suppl. 5, Springer–Verlag, Vienna, 1984, pp. 169–192.
- [1921] T. KAURANNE, *Summary of GENESIS work at the European Centre for Medium range Weather Forecasts (ECMWF)*, Parallel Comput., 20 (1994), pp. 1685–1688.
- [1922] T. KAURANNE AND S. R. M. BARROS, *Scalability estimates of parallel spectral atmospheric models*, in Proceedings of the Fifth ECMWF Workshop on the Use of Parallel Processors in Meteorology. Parallel Supercomputing in Atmospheric Science, G. R. Hoffman and T. Kauranne, eds., Singapore, 1993, World Scientific, pp. 312–328.
- [1923] H. KAWARADA, H. FUJITA, AND H. KAWAHARA, *Variational inequalities for Navier–Stokes flows coupled with potential flow through porous media*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 403–410.
- [1924] K. KAYVANTASH AND G. THIERAUF, *A concurrent and parallel processing methodology for the analysis, design and optimization of coupled thermal/structural interaction based on domain decomposition and substructuring techniques*, Comput. Syst. Eng., 2 (1991), pp. 497–507.
- [1925] H. B. KELLER, *Domain decomposition in boundary element methods*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 50–57.
- [1926] C. T. KELLEY, *A fast two-grid method for matrix H-equations*, Trans. Th. Stat. Phys., 18 (1989), pp. 185–204.
- [1927] ———, *Operator prolongation methods for nonlinear equations*, in Computational Solution of Nonlinear Systems of Equations, E. L. Allgower and K. Georg, eds., vol. 26 of AMS Lectures in Applied Mathematics, American Mathematical Society, Providence, RI, 1990, pp. 359–388.
- [1928] ———, *Iterative Methods for Linear and Nonlinear Equations*, vol. 16 of Frontiers in Applied Mathematics, SIAM, Philadelphia, 1995a.
- [1929] ———, *Iterative Methods for Optimization*, vol. 18 of Frontiers in Applied Mathematics, SIAM, Philadelphia, 1999a.
- [1930] C. T. KELLEY AND J. I. NORTHRUP, *A fast multi-level method for the fixed point form of matrix H-equations*, Trans. Th. Stat. Phys., 22 (1993), pp. 533–547.
- [1931] C. T. KELLEY AND E. W. SACHS, *Fast algorithms for compact fixed point problems with inexact function evaluations*, SIAM J. Sci. Stat. Comput., 12 (1991), pp. 725–742.
- [1932] R. B. KELLOGG AND J. E. OSBORN, *A regularity result for the Stokes problem on a convex polygon*, J. Func. Anal., 21 (1976), pp. 397–431.
- [1933] S. KERAS, *Combining waveform relaxation and domain decomposition*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 138–146.
- [1934] B. W. KERNIGHAN AND S. LIN, *An efficient heuristic procedure for partitioning graphs*, The Bell System Technical Journal, (1970), pp. 291–307.
- [1935] D. S. KERSHAW, *The incomplete Cholesky-conjugate gradient method for the iterative solution of systems of linear equations*, J. Comput. Phys., 26 (1978), p. 43.
- [1936] R. KETTLER, *Analysis and comparison of relaxation schemes in robust multigrid and preconditioned conjugate gradient methods*, in Multigrid Methods, W. Hackbusch and U. Trottenberg, eds., vol. 960 of Lecture Notes in Mathematics, Berlin, 1982, Springer–Verlag, pp. 502–534.

- [1937] ———, *Linear Multigrid Methods for Numerical Reservoir Simulation*, PhD thesis, Technical University Delft, Delft, 1987.
- [1938] R. KETTLER AND J. A. MEIJERINK, *A multigrid method and a combined multigrid-conjugate gradient method for elliptic problems with strongly discontinuous coefficients in general domains*, Shell Publication 604, (1981).
- [1939] R. KETTLER AND P. WESSELING, *Aspects of multigrid methods for problems in three dimensions*, Appl. Math. Comput., 19 (1986), pp. 159–168.
- [1940] D. E. KEYES, *Domain decomposition methods for the parallel computation of reacting flows*, Comput. Phys. Commun., 53 (1989), pp. 181–200.
- [1941] ———, *Domain decomposition techniques for the parallel solution of nonsymmetric systems of elliptic boundary value problems*, Appl. Numer. Math., 6 (1989), pp. 281–301.
- [1942] D. E. KEYES, T. F. CHAN, G. A. MEURANT, J. S. SCROGGS, AND R. G. VOIGT, *Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations*, SIAM, Philadelphia, 1992.
- [1943] D. E. KEYES AND W. D. GROPP, *A comparison of domain decomposition techniques for elliptic partial differential equations*, SIAM J. Sci. Stat. Comput., 8 (1987), pp. 166–202.
- [1944] ———, *Domain decomposition techniques for nonsymmetric systems of equations: examples from computational fluid dynamics*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 321–339.
- [1945] ———, *Domain decomposition techniques for the parallel solution of nonsymmetric systems of elliptic BVP's*, Appl. Numer. Math., 6 (1990), pp. 281–301.
- [1946] ———, *Domain-decomposable preconditioners for second-order upwind discretizations of multicomponent systems*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 129–139.
- [1947] D. E. KEYES, W. D. GROPP, AND A. ECDER, *Domain decomposition techniques for large sparse nonsymmetric systems arising from elliptic problems with first-order terms*, in Proceedings of a Symposium on the Solution of Super Large Problems in Computational Mechanics, J. H. Kane and A. D. Carlson, eds., New York, 1989, Plenum.
- [1948] D. E. KEYES AND M. D. SMOOKE, *Flame sheet starting estimates for counterflow diffusion flame problems*, J. Comput. Phys., 73 (1986), pp. 267–288.
- [1949] ———, *A parallelized elliptic solver for reacting flows*, in Parallel Computations and Their Impact on Mechanics, New York, 1987, The American Society of Mechanical Engineers.
- [1950] D. E. KEYES AND J. XU, *Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition*, vol. 180 of Contemporary Mathematics, American Mathematical Society, Providence, Rhode Island, 1994.
- [1951] K. KHADRA, P. ANGOT, AND J.-P. CALTAGIRONE, *Comparison of locally adaptive multigrid methods: L.D.C. F.A.C. and F.I.C.*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 275–292.
- [1952] M. KHALIL, *Local mode smoothing analysis of various incomplete factorization iterative methods*, in Robust Multi-Grid Methods, vol. 23 of Notes on Numerical Fluid Mechanics, Braunschweig, 1989, Vieweg, pp. 155–164.
- [1953] M. KHALIL AND P. WESSELING, *A cell-centered multigrid method for three-dimensional anisotropic-diffusion and interface problems*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 3, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 99–117.
- [1954] ———, *Vertex-centered and cell-centered multigrid for interface problems*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 3, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 61–97.
- [1955] ———, *Vertex-centered and cell-centered multigrid for interface problems*, J. Comput. Phys., 98 (1992), pp. 1–20.
- [1956] A. I. KHAN AND B. H. V. TOPPING, *Subdomain generation for parallel finite element analysis*, Comput. Syst. Eng., 4 (1993), pp. 473–488.
- [1957] S. A. KHARCHENKO, L. Y. KOLOTILINA, A. A. NIKISHIN, AND A. Y. YEREMIN, *A robust ainv-type preconditioning method for constructing sparse approximate inverse preconditioners in factored form*, Numer. Lin. Alg. Appl., 8 (2001), pp. 165–179.

- [1958] B. N. KHOROMSKIJ AND G. E. MAZURKEVICH, *Preconditioners for one class of elliptic problems in not simply connected domains*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 56–61.
- [1959] B. N. KHOROMSKIJ, G. E. MAZURKEVICH, AND E. P. ZHIDOV, *Algorithms of box domain decomposition for solution of 3-D elliptic problems*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 213–222.
- [1960] B. N. KHOROMSKIJ AND W. L. WENDLAND, *Spectrally equivalent preconditioners for boundary equations in substructuring techniques*, East-West J. Numer. Math., 1 (1992), pp. 1–25.
- [1961] B. N. KHOROMSKIJ AND G. WITTUM, *An asymptotically optimal substructuring method for the Stokes equation*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 31–39.
- [1962] ———, *Robust interface reduction for highly anisotropic elliptic equations*, in Multigrid Methods V, vol. 3 of Lecture Notes in Computational Science and Engineering, Berlin, 1998, Springer, pp. 140–156.
- [1963] F. KICKINGER, *Algebraic multigrid for discrete elliptic second-order problems*, in Multigrid Methods V, vol. 3 of Lecture Notes in Computational Science and Engineering, Berlin, 1998, Springer, pp. 157–172.
- [1964] J. E. KILLOUGH AND R. BHOGESWARA, *Simulation of compositional reservoir phenomena on a distributed-memory parallel computer*, JPT J. Pet. Technol., 43 (1991), pp. 1368–1374.
- [1965] C. KIM, J. GAUDIOT, AND W. PROSKUROWSKI, *Parallel computing with the Sisal applicative language: programmability and performance issues*, Software Practice Experience, 26 (1996), pp. 1025–1051.
- [1966] K. H. KIM AND F. SADEGHI, *Three-dimensional temperature distribution in EHD lubrication. Part I: Circular contact*, J. Tribol. Trans. ASME, 114 (1992), pp. 32–41.
- [1967] S. KIM, *Numerical treatments for the Helmholtz problem by domain decomposition techniques*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 245–250.
- [1968] Y. H. KIM AND N. Z. CHO, *Parallel solution of the neutron diffusion equation with the domain decomposition method on a transputer network*, Nucl. Sci. Eng., 114 (1993), pp. 252–270.
- [1969] G. KING, F. C. SZE, P. MAK, T. A. GROTJOHN, AND J. ASMUSSEN, *Ion and neutral energies in a multipolar electron cyclotron resonance plasma source*, J. Vac. Sci. Technol. A, Vac. Surf. Films, 10 (1992), pp. 1265–1269.
- [1970] T. KIOUSTELIDIS AND H. HEROLD, *Bpx on Convex's MPP: an astrophysical application*, in Parallel Processing for Scientific Computing, SIAM Proceedings, Philadelphia, 1995, SIAM, pp. 361–366.
- [1971] S. KIRKPATRICK AND C. G. ADN M. VECCHI, *Optimization by simulated annealing*, Science, 220 (1983), pp. 671–680.
- [1972] M. KISCHINHEVSKY, *A direct domain decomposition procedure for elliptic problems*, in Parallel Processing for Scientific Computing, SIAM Proceedings, Philadelphia, 1995, SIAM, pp. 405–406.
- [1973] A. KLAWONN, *Two preconditioners for saddle point problems with penalty term*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 147–154.
- [1974] A. KLAWONN AND L. PAVARINO, *A comparison of overlapping Schwarz methods and block preconditioners for saddle point problems*, Numer. Lin. Alg. Appl., 7 (2000), pp. 1–25.
- [1975] A. KLOS, *Parallel solution of physical systems using process of homeostasis*, Int. J. Electr. Power Energy Syst., 16 (1994), pp. 67–71.
- [1976] K. KNEILE, *Accelerated convergence of structured banded systems using constrained corrections*, in Multigrid Methods, H. Lomax, ed., NASA Conference Publication 2202, Ames Research Center, Moffit Field, CA, 1982, pp. 285–303.
- [1977] D. A. KNOLL AND W. J. RIDER, *A multigrid preconditioned Newton-Krylov method*, SIAM J. Sci. Comput., 21 (1999), pp. 692–710.
- [1978] R. KNURA, *Lösung von Navier-Stokes-Gleichungen in L-förmigen Gebieten mit Mehrgittermethoden*, PhD thesis, Institut für Angewandte Mathematik, Universität Düsseldorf,

1985.

- [1979] A. V. KNYAZEV AND A. L. SKOROKHODOV, *Preconditioned iterative methods in subspace for solving linear systems with indefinite coefficient matrices and eigenvalue problems*, Sov. J. Numer. Anal. Math. Modeling, 4 (1989), pp. 282–310.
- [1980] J. KO, A. J. KURDILA, AND M. PILANT, *Wavelet galerkin multigrid methods*, in Collection of Technical Papers - Proceedings of the AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, vol. 1, New York, NY, 1994, AIAA, pp. 224–234.
- [1981] G. M. KOBEL'KOV, *Fictitious domain method and the solution of elliptic equations with highly varying coefficients*, Sov. J. Numer. Anal. Math. Modeling, 2 (1987), pp. 407–420.
- [1982] M. KOČVARA, *An algebraic study of a local multigrid method for variational problems*, Appl. Math. Comput., 51 (1992), pp. 17–41.
- [1983] ———, *Adaptive multigrid technique for three-dimensional elasticity*, J. Numer. Meth. Engrg., 36 (1993), pp. 1703–1716.
- [1984] M. KOČVARA AND J. MANDEL, *A multigrid method for three-dimensional elasticity and algebraic convergence estimates*, Appl. Math. Comput., 23 (1987), pp. 121–135.
- [1985] C. KOECK, *Computation of three-dimensional flow using the Euler equations and a multiple-grid scheme*, Int. J. Numer. Meth. Fluids, 5 (1985), pp. 483–500.
- [1986] C. KOECK AND J. J. CHATTOT, *Computation of three dimensional vortex flows past wings using the Euler equations and a multiple-grid scheme*, in Proceedings of the Ninth International Conference on Numerical Methods in Fluid Dynamics, Soubaramayer and J. P. Boujot, eds., vol. 218 of Lecture Notes in Physics, Springer-Verlag, Berlin, 1985.
- [1987] H. K. KOESMARNO, *Heuristic scheduling algorithm: reducing global convergence detection overhead of multigrid methods on transputer networks*, in Proceedings of the Sixth Australian Transputer OCCAM User Group, Brisbane, 1994, pp. 191–198.
- [1988] C.-S. KOH, K. CHOI, S. HAHN, AND H. K. JUNG, *An adaptive finite element scheme using multi-grid method for magnetostatic problems*, IEEE Trans. Magnetics, 25 (1989), pp. 2959–2961.
- [1989] L. Y. KOLOTILINA, A. A. NIKISHIN, AND A. Y. YEREMIN, *An incomplete LU-factorization algorithm based on block bordering*, Numer. Lin. Alg. Appl., 7 (2000), pp. 543–567.
- [1990] L. Y. KOLOTILINA AND A. Y. YEREMIN, *Block SSOR preconditionings for high order 3D FE systems*, BIT, 29 (1989), pp. 805–823.
- [1991] O. KOLP, *A mapping of multi-level problems to multi-dimensional crossbar networks*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 1, Denver, 1991, University of Colorado, pp. 7–14.
- [1992] ———, *A mapping of multi-level problems to multi-dimensional crossbar networks*, Comm. Appl. Num. Methods, 8 (1992), pp. 597–607.
- [1993] O. KOLP AND H. MIERENDORFF, *Bus coupled systems for multigrid algorithms*, in Multigrid Methods II, W. Hackbusch and U. Trottenberg, eds., Lecture Notes in Mathematics, Springer-Verlag, Berlin, 1986, pp. 203–219.
- [1994] ———, *Efficient multigrid algorithms for locally constrained parallel systems*, Appl. Math. Comput., 19 (1986), pp. 169–200.
- [1995] ———, *Performance estimations for SUPRENUM systems*, Parallel Comput., 7 (1988), pp. 357–366.
- [1996] O. KOLP, H. MIERENDORFF, AND W. SEIDEL, *Analysis of multigrid methods for non-shared memory systems by a simple performance model*, in CONPAR 86: Conference on Algorithms and Hardware for Parallel Processing, Berlin, 1986, Springer-Verlag, pp. 95–103.
- [1997] B. KOOBUS, M. H. LALLEMAND, AND A. DERVIEUX, *Unstructured volume agglomeration MG: solution of the Poisson equation*, Int. J. Numer. Methods Fluids, 18 (1994), pp. 27–42.
- [1998] D. A. KOPRIVA, *A spectral multidomain method for the solution of hyperbolic systems*, Appl. Numer. Math., 2 (1986), pp. 221–241.
- [1999] ———, *Computation of hyperbolic equations on complicated domains with patched and overset Chebyshev grids*, SIAM J. Sci. Stat. Comput., 10 (1989), pp. 120–132.
- [2000] ———, *Solution of hyperbolic equations on complicated domains with patched and overset Chebyshev grids*, SIAM J. Sci. Stat. Comput., 10 (1989), pp. 120–132.
- [2001] ———, *Multidomain spectral solution of the Euler gas-dynamic equations*, J. Comput. Phys., 96 (1991), pp. 428–450.
- [2002] D. A. KOPRIVA AND M. Y. HUSSAINI, *Multidomain spectral solution of shock-turbulence interactions*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Peraux,

- and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 340–350.
- [2003] B. KOREN, *Defect correction and multigrid for an efficient and accurate computation of airfoil flows*, J. Comput. Phys., 77 (1988), pp. 183–206.
- [2004] ———, *Multigrid and defect correction for the steady Navier-Stokes equations*, in Proceedings of the Fourth GAMM-Seminar on Robust Multi-Grid Methods, Kiel, 1988, P. Wesseling, ed., vol. 23 of Notes on Numerical Fluid Mechanics, Braunschweig, 1988, Vieweg, pp. 165–177.
- [2005] ———, *Euler flow solutions for transonic shock wave - boundary layer interaction*, Int. J. Numer. Meth. Fluids, 9 (1989), pp. 59–73.
- [2006] ———, *Multigrid and defect correction for the steady Navier-Stokes equations*, in Robust Multi-Grid Methods, W. Hackbusch, ed., vol. 23 of Notes on Numerical Fluid Mechanics, Braunschweig, 1989, Vieweg, pp. 165–177.
- [2007] ———, *Upwind schemes, multigrid and defect correction for the steady Navier-Stokes equations*, in Proceedings of the 11-th International Conference on Numerical Methods in Fluid Dynamics, Williamsburg, Virginia, 1988, D. L. Dwyer, M. Y. Hussaini, and R. G. Voigt, eds., vol. 323 of Lecture Notes in Physics, Berlin, 1989, Springer-Verlag, pp. 344–348.
- [2008] ———, *Euler flow solutions for a transonic wind tunnel section*, in Proceedings of the V. Aerodynamic Seminar, Aachen, 1987, A. Nastase, ed., vol. 2 of Proceedings of High Speed Aerodynamics, Aachen, 1990, Mainz, pp. 14–26.
- [2009] ———, *Multigrid and defect correction for the steady Navier-Stokes equations*, J. Comput. Phys., 87 (1990), pp. 25–46.
- [2010] ———, *Upwind discretization of the steady Navier-Stokes equations*, Int. J. Numer. Meth. Fluids, 11 (1990), pp. 99–117.
- [2011] ———, *A computational tool for analyzing strong viscous-inviscid interactions in gasdynamics*, in Proceedings of the CP90 Europhysics Conference on Computational Physics, Amsterdam, 1990, A. Tenner, ed., Singapore, 1991, World Scientific, pp. 395–399.
- [2012] ———, *Low-diffusion rotated upwind schemes, multigrid and defect correction for steady, multi-dimensional Euler flows*, in Multigrid Methods III, W. Hackbusch and U. Trottenberg, eds., vol. 98 of International Series of Numerical Mathematics, Basel, 1991, Birkhäuser, pp. 265–276.
- [2013] ———, *Multigrid and defect correction for the steady Navier-Stokes equations, application to aerodynamics*, vol. 74 of CWI Tracts, CWI, Amsterdam, 1991.
- [2014] ———, *Condition improvement for point relaxation in multigrid, subsonic Euler flow computations*, Appl. Numer. Math., 16 (1995), pp. 457–469.
- [2015] B. KOREN AND P. W. HEMKER, *Damped, direction dependent multigrid for hypersonic flow computations*, Appl. Numer. Math., 7 (1991), pp. 309–328.
- [2016] ———, *Multi-dimensional upwind schemes, multigrid and defect correction for accurate and efficient Euler flow computations*, in Aerodynamics for Space Vehicles, W. Berry and B. Battrick, eds., ESTEC, Noordwijk, The Netherlands, 1991, European Space Agency, pp. 129–134.
- [2017] ———, *Efficient multigrid computation of steady hypersonic flows*, in Computational Methods in Hypersonic Aerodynamics, T. K. S. Murthy, ed., Dordrecht, Boston, London, 1992, Kluwer Academic Publishers, pp. 203–231.
- [2018] ———, *Multi-D upwinding and multigridding for steady Euler flow computations*, in Proceedings of the Ninth GAMM Conference on Numerical Methods in Fluid Mechanics, Lausanne, 1991, J. B. Vos, A. Rizzi, and I. L. Ryhming, eds., vol. 35 of Notes on Numerical Methods in Fluid Mechanics, Braunschweig, 1992, Vieweg, pp. 89–98.
- [2019] B. KOREN AND M.-H. LALLEMAND, *Iterative defect correction and multigrid accelerated explicit time stepping for the steady Euler equations*, in Proceedings of the ICFD Conference on Numerical Methods for Fluid Dynamics, Reading, 1992, K. W. Morton and M. J. Baines, eds., Oxford, 1993, Clarendon Press, pp. 207–220.
- [2020] B. KOREN AND B. LEER, *Analysis of preconditioning and multigrid for Euler flows with low-subsonic regions*, Adv. Comput. Math., 4 (1995), pp. 127–144.
- [2021] B. KOREN AND H. T. M. MAAREL, *Analysis of transonic shock configurations by a solution-adaptive multigrid technique*, in Preliminary Proceedings of the Fourth International Symposium on Computational Fluid Dynamics, Davis, California, 1991, pp. 640–645.
- [2022] ———, *On steady, inviscid shock waves at continuously curved, convex surfaces*, Theoretical Comput. Fluid Dyn., 4 (1993), pp. 177–195.
- [2023] B. KOREN AND S. P. SPEKREIJSE, *Multigrid and defect correction for the efficient solution of the steady Euler equations*, in Research in Numerical Fluid Mechanics, P. Wesseling, ed., vol. 17 of Notes on Numerical Fluid Mechanics, Vieweg, Braunschweig, 1987, pp. 87–100.

- [2024] ———, *Solution of the steady Euler equations by a multigrid method*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 323–336.
- [2025] B. KOREN AND H. T. M. VAN DER MAAREL, *On steady, inviscid shock waves at continuously curved, convex surfaces*, Theor. and Comput. Fluid Dyn., (1993), pp. 177–195.
- [2026] V. G. KORNEEV AND U. LANGER, *Approximate solution of plastic flow theory problems*, vol. 69 of Teubner–Texte zur Mathematik, Teubner–Verlag, Leipzig, 1984.
- [2027] R. KORNHUBER, *Monotone multigrid methods for elliptic variational inequalities. i*, Numer. Math., (1994), pp. 167–184.
- [2028] ———, *Adaptive monotone multigrid methods for some non-smooth optimization problems*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 177–191.
- [2029] ———, *On robust multigrid methods for non-smooth variational problems*, in Multigrid Methods V, vol. 3 of Lecture Notes in Computational Science and Engineering, Berlin, 1998, Springer, pp. 173–188.
- [2030] R. KORNHUBER AND H. YSERENTANT, *Multilevel methods for elliptic problems on domains not resolved by the coarse grid*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 49–60.
- [2031] J. KORSAWE AND G. STARKE, *Multilevel projection methods for nonlinear least-squares finite element computations*, Elect. Trans. Numer. Anal., 10 (2000), pp. 56–73.
- [2032] S. KORTAS AND P. ANGOT, *Parallel preconditioners for a fourth-order discretization of the viscous Burgers equation*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 397–405.
- [2033] J. KORYCKI, *On a distributed implementation of a decomposition method for multistage linear stochastic programs*, Optimization, 38 (1996), pp. 173–200.
- [2034] M. KORZEN, R. SCHRIEVER, K.-U. ZIENER, O. PAETSCH, AND G. W. ZUMBUSCH, *Real-time 3-d visualization of surface temperature fields measured by thermocouples on steel structures in fire engineering*, in Proceedings of International Symposium Local Strain and Temperature Measurements in Non-Uniform Fields at Elevated Temperatures, J. Ziebs, J. Bressers, H. Frenz, D. R. Hayhurst, H. Klingelhöffer, and S. Forest, eds., Woodhead Publishing, 1996, pp. 253–262.
- [2035] J. KOUATCHOU, *Asymptotic stability of a 9-point multigrid algorithm for convection-diffusion equations*, Elect. Trans. Numer. Anal., 6 (1997), pp. 153–161.
- [2036] R. H. KRAUSE AND B. I. WOHLMUTH, *Multigrid methods for mortar finite elements*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer–Verlag, pp. 136–142.
- [2037] A. KRECHEL AND K. STÜBEN, *Operator dependent interpolation in algebraic multigrid*, in Multigrid Methods V, vol. 3 of Lecture Notes in Computational Science and Engineering, Berlin, 1998, Springer, pp. 189–211.
- [2038] M. KRIZEK, L. LIU, AND P. NEITTAANMAKI, *Post-processing of Gauss-Seidel iterations*, Numer. Lin. Alg. Appl., 6 (1999), pp. 147–156.
- [2039] M. KŘÍŽEK AND P. NEITTANMÄKI, *Superconvergence phenomenon in the finite element method arising from averaging gradients*, Numer. Math., 45 (1984), pp. 105–116.
- [2040] N. KROLL, *Direkte Anwendungen von Mehrgittertechniken auf parabolische Anfangsrandwertaufgaben*, PhD thesis, Institut für Angewandte Mathematik, Universität Bonn, 1981.
- [2041] ———, *Anforderungen an Rechnerleistungen aus der Sicht der numerischen Aerodynamik*, in Rechnerarchitekturen für die numerische Simulation auf der Basis superschneller Lösungsverfahren II, U. Trottenberg and P. Wypior, eds., GMD-Studien Nr. 102, Gesellschaft für Mathematik und Datenverarbeitung, St. Augustin, 1985, pp. 241–252.
- [2042] P. KRZYZANOWSKI, *A domain decomposition method for micropolar fluids*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 155–162.
- [2043] H.-C. KU, *A submerged body moving in a stratified medium via domain decomposition technique*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 498–505.
- [2044] ———, *Solution of flow in complex geometries by the pseudospectral element method*, J. Comput. Phys., 117 (1995), pp. 215–227.
- [2045] H.-C. KU, H. E. GILREATH, R. RAUL, AND J. C. SOMMERER, *Direct numerical simulation*

- of jet flow via a multi-block technique*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 509–514.
- [2046] H.-C. KU, R. S. HIRSH, T. D. TAYLOR, AND A. P. ROSENBERG, *A domain decomposition approach for the computation of incompressible flow flow by the pseudospectral matrix element method and its parallel implementation*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 351–360.
- [2047] H.-C. KU AND A. S. POPEL, *The multigrid-mask numerical method for solution of incompressible Navier–Stokes equations*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 425–437.
- [2048] H.-C. KU AND B. RAMASWAMY, *Multi-grid domain decomposition approach for solution of Navier–Stokes equations in primitive variable form*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 293–304.
- [2049] ———, *Multi grid domain decomposition approach for solution of Navier Stokes equations in primitive variable form*, Int. J. Numer. Meth. Engng., 38 (1995), pp. 667–683.
- [2050] V. V. KUCHERENKO, *Numerical solution of elliptic problems by the projection method on a sequence of grids*, Dokl. Akad. Nauk USSR, 287 (1986), pp. 781–785.
- [2051] ———, *An analysis of convergence of the multigrid method for stiff problems*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 185–194.
- [2052] V. V. KUCHERENKO AND V. B. BERKUN, *Analysis of convergence of the multigrid method for stiff problems in complex-shape domains*, Dokl. Akad. Nauk USSR, 297 (1987), pp. 1307–1310.
- [2053] H. KUERTEN AND B. GEURTS, *Compressible turbulent flow simulation with a multigrid multi-block method*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 305–315.
- [2054] ———, *Multigrid acceleration of a block structured compressible flow solver*, J. Engrg. Math., 29 (1995), pp. 11–31.
- [2055] N. KUKUTSU, N. YOSHIDA, AND I. FUKAI, *Application of multigrid technique to the spatial network method*, Elec. Comm. Japan, Part 2, 74 (1991), pp. 34–42. Translated from Denshi Joho Tsushin Gakkai Ronbunshi, 73-C-1 (1990), pp. 493–500.
- [2056] K. KUNISCH AND X.-C. TAI, *Nonoverlapping domain decomposition methods for inverse problems*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 517–524.
- [2057] ———, *Sequential and parallel splitting methods for bilinear control problems in Hilbert spaces*, SIAM J. Numer. Anal., (1997).
- [2058] A. KUNOTH, *Multilevel preconditioning – Appending boundary conditions by Lagrange multipliers*, Adv. Comput. Math., 4 (1995), pp. 145–170.
- [2059] C. KUO, *Parallel algorithms and architectures for solving elliptic partial differential equations*, master's thesis, M.I.T., 1985.
- [2060] C. KUO AND B. C. LEVY, *Discretization and solution of elliptic pdes a digital signal processing approach*, Proc. IEEE, 78 (1990), pp. 1808–1842.
- [2061] C. C. J. KUO AND T. F. CHAN, *Two-color Fourier analysis of iterative algorithms for elliptic problems with red/black ordering*, SIAM J. Sci. Stat. Comput., 11 (1990), pp. 767–793.
- [2062] C. C. J. KUO, T. F. CHAN, AND C. TONG, *Multilevel filtering elliptic preconditioner*, SIAM J. Sci. Stat. Comput., 11 (1990), pp. 403–429.
- [2063] C. C. J. KUO AND B. C. LEVY, *A two-level four-color SOR method*, SIAM J. Numer. Anal., 26 (1989), pp. 129–151.
- [2064] C.-C. J. KUO AND B. C. LEVY, *Two-color Fourier analysis of the multigrid method with red-black Gauss-Seidel smoothing*, Appl. Math. Comput., 29 (1989), pp. 69–87.
- [2065] I. KUZNETSOV, S. KUZNETSOV, AND K. SHKOLNIK, *Parallel SOR for domain decomposition method*, in First World Conference on Parallel Computing in Engineering and Engineering Education, 1990, pp. 223–227.
- [2066] Y. A. KUZNETSOV, *Multigrid domain decomposition method for elliptic problems*, in Proc. Eighth Int. Conf. on Comp. Meth. for Appl. Sci. and Eng., vol. 2, 1987, pp. 605–616.
- [2067] ———, *New algorithms for approximate realization of implicit difference schemes*, Sov. J.

- Numer. Anal. Math. Modeling, 3 (1988), pp. 99–114.
- [2068] ———, *Algebraic multigrid domain decomposition methods*, Sov. J. Numer. Anal. Math. Modeling, 4 (1989), pp. 361–392.
- [2069] ———, *Multi-level domain decomposition methods*, Appl. Numer. Math., 6 (1989), pp. 303–314.
- [2070] ———, *Domain decomposition methods for unsteady convection–diffusion problems*, in Computing Methods in Applied Sciences and Engineering, R. Glowinski and A. Lichnewsky, eds., SIAM, Philadelphia, 1990, pp. 211–227.
- [2071] ———, *Multigrid domain decomposition methods*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1990, SIAM, pp. 290–313.
- [2072] ———, *Overlapping domain decomposition methods for FE-problems with elliptic singular perturbed operators*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 223–241.
- [2073] ———, *Overlapping domain decomposition methods for parabolic problems*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 63–69.
- [2074] ———, *Efficient iterative solvers for elliptic finite element problems on nonmatching grids*, Russ. J. Numer. Anal. Math. Modeling, 10 (1995), pp. 187–211.
- [2075] ———, *Overlapping domain decomposition with non-matching grids*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 606–617.
- [2076] Y. A. KUZNETSOV AND S. MALIASSOV, *Substructuring preconditioners for nonconforming finite element approximations of second-order elliptic problems with anisotropy*, Russ. J. Numer. Anal. Math. Modeling, 10 (1995), pp. 511–533.
- [2077] Y. A. KUZNETSOV, P. NEITTAANMÄKI, AND P. TARVAINEN, *Overlapping domain decomposition methods for the obstacle problem*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 271–277.
- [2078] ———, *Schwarz methods for obstacle problems with convection– diffusion operators*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 251–256.
- [2079] Y. A. KUZNETSOV AND G. K. OSORGIN, *Multigrid method for the plane problem of elasticity theory*, Sov. J. Numer. Anal. Math. Modeling, 5 (1990).
- [2080] Y. A. KUZNETSOV AND M. H. WHEELER, *Optimal order substructuring preconditioners for mixed finite element methods on nonmatching grids*, E. W. J. Numer. Math., 3 (1995), pp. 127–143.
- [2081] C. LACOUR, *Iterative substructuring preconditioners for the mortar finite element method*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 406–412.
- [2082] C. LACOUR AND Y. MADAY, *Two different approaches for matching nonconforming grids: the mortar element method and the FETI method*, BIT, 37 (1997), pp. 720–738.
- [2083] M. LACROIX, R. CAMARERO, AND A. TAPUCU, *Multigrid scheme for thermohydraulic flow*, Numer. Heat Transf., 7 (1984), pp. 375–393.
- [2084] P. LADEVEZE AND D. DUREISSEIX, *Une nouvelle stratégie de calcul micro/macro en mécanique des structures*, C.R. Acad. Sci. Paris, t. 327, Serie IIb (1999), pp. 1237–1244.
- [2085] ———, *A micro / macro approach for parallel computing of heterogeneous structures*, International Journal for Computational Civil and Structural Engineering, 1 (2000), pp. 18–28.
- [2086] P. LADEVEZE, O. LOISEAU, AND D. DUREISSEIX, *A micro-macro and parallel computational strategy for highly heterogeneous structures*, Int. J. Numer. Meth. Engng., 52 (2001), pp. 121–138.
- [2087] P. LADEVEZE AND P. LORONG, *A large time increment approach with domain decomposition technique for mechanical non linear problems*, in Proceedings of the 10th International Conference on Computing Methods in Applied Sciences and Engineering, R. Glowinski, ed., New York, 1992, Nova Science Publishers, pp. 569–578.
- [2088] B. LAFOURIE, C. NARDONE, R. SCARDOVELLI, S. ZALESKI, AND G. ZANETTI, *Modelling merging and fragmentation in multiphase flows with SURFER*, J. Comput. Phys., 113 (1994),

- pp. 134–147.
- [2089] J. M. LAFERTE, P. PEREZ, AND F. HEITZ, *Global non linear multigrid optimization for image analysis tasks*, in IEEE International Conference on Acoustics, Speech and Signal Processing, vol. 5, Los Alamitos, CA, 1994, IEEE, pp. 533–536.
 - [2090] D. LAHAYE, *Algebraic Multigrid for Two-Dimensional Time-Harmonic Magnetic Field Computations*, PhD thesis, Katholieke Universiteit Leuven, Leuven, Belgium, 2001.
 - [2091] D. LAHAYE, H. DE GERSEM, S. VANDEWALLE, AND K. HAMEYER, *Algebraic multigrid for complex symmetric systems*, IEEE Trans. Magn., 36 (2000), pp. 1535–1538.
 - [2092] C. H. LAI, *Diakoptics, domain decomposition and parallel computing*, Comput. J., 37 (1994), pp. 840–846.
 - [2093] ———, *An iterative scheme for non-symmetric interface operator*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 279–285.
 - [2094] ———, *On domain decomposition and shooting methods for two-point boundary value problems*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 257–263.
 - [2095] C.-H. LAI, *Applications of quasi-Newton methods for the numerical coupling of some nonlinear problems*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 827–834.
 - [2096] ———, *A distributed algorithm for 1-D nonlinear heat conduction with an unknown point source*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 768–775.
 - [2097] C.-H. LAI, A. M. CUFFE, AND K. A. PERIDEOUS, *A domain decomposition technique for viscous/inviscid coupling*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 485–492.
 - [2098] C. H. LAI AND H. J. J. RIELE, *Solving some 1-D semiconductor device problems on a matrix coprocessor using a domain decomposition method*, Supercomputer, 10 (1993), pp. 24–32.
 - [2099] C.-Y. G. LAI, *Implementation of hybrid V-cycle multilevel methods for mixed finite element systems with penalty*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 439–453.
 - [2100] M. H. LALLEMAND, *Schémas décentrés multigrilles pour la résolution des équations d'Euler en éléments finis*, PhD thesis, University of Marseilles, France, 1988.
 - [2101] M. H. LALLEMAND AND A. DERVIEUX, *A multigrid finite element method for solving the two-dimensional Euler equations*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 337–363.
 - [2102] M. H. LALLEMAND AND B. KOREN, *Iterative defect correction and multigrid accelerated explicit time stepping schemes for the steady Euler equations*, SIAM J. Sci. Comput., 14 (1993), pp. 953–970.
 - [2103] M. H. LALLEMAND, H. STEVE, AND A. DERVIEUX, *Unstructured multigridding by volume agglomeration: current status*, Comput. Fluids, 21 (1992), pp. 397–433.
 - [2104] U. LANGER, *On the choice of iterative parameters in the relaxation method on a sequence of meshes*, U.S.S.R. Comput. Math. and Math. Phys., 22 (1982), pp. 98–114.
 - [2105] ———, *Zur iterativen Lösung gewisser FEM–Schemata für elliptische Gleichungen der Ordnung $2n$, $n > 1$* , Z. Vycisl. Mat. i. Mat. Fiz., 23 (1983), pp. 881–891.
 - [2106] ———, *Effektive Auflösungsverfahren für elliptische Randwertaufgaben in speziellen und beliebigen Gebieten*, in 8. TMP, Karl-Marx-Stadt 1983, Leipzig, 1984, Teubner–Verlag, pp. 147–155. Teubner–Texte zur Mathematik, Bd. 63.
 - [2107] ———, *Multigrid-methods for some problems in solid mechanics*, in Algoritmy 87, 9. sympozia o algoritmoch, Strbske pleso 1987, 1987, pp. 149–154.
 - [2108] ———, *Applications of multigrid preconditioners to mixed and nonlinear variational problems*, in 9. TMP, Karl-Marx-Stadt 1988, Leipzig, 1989, Teubner–Verlag, pp. 148–158. Teubner–Texte zur Mathematik, Bd. 111.
 - [2109] ———, *Parallel iterative solution of symmetric coupled FE/BE–equations via domain decomposition*, Contemp. Math., 157 (1994), pp. 335–344.
 - [2110] ———, *Parallel iterative solution of symmetric coupled FE/BE-equations via domain de-*

- composition*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 335–344.
- [2111] A. LANZA, *Multigrid in general relativity. Part II: Kerr spacetime*, Class. Quantum Gravity, 9 (1992), pp. 677–696.
 - [2112] ———, *Self gravitating thin disks around rapidly rotating black holes*, Astrophys. J., 389 (1992), pp. 141–156.
 - [2113] S. LARSSON, V. THOME, AND S. Z. ZHOU, *On multigrid methods for parabolic problems*, J. Comput. Math., 13 (1995), pp. 193–205.
 - [2114] M. LASCALA, A. BOSE, D. J. TYLAVSKY, AND T. S. CHAI, *A highly parallel multigrid method for power systems transient stability analysis*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 3, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 131–138.
 - [2115] M. LASCALA, R. SBRIZZAI, AND F. TORELLI, *A pipelined in time parallel algorithm for transient stability analysis (power systems)*, IEEE Trans. Power Syst., 6 (1991), pp. 715–722.
 - [2116] B. LASTDRAGER, B. KOREN, AND J. VERWER, *The sparse-grid combination technique applied to time-dependent advection problems*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 143–149.
 - [2117] M. L. LAURSEN, J. SMIT, AND J. C. VINK, *Multigrid updating of $U(1)$ gauge fields*, Phys. Lett. B, 262 (1991), pp. 467–471.
 - [2118] M. L. LAURSEN AND J. C. VINK, *Multigrid updating of compact $U(1)$ gauge fields in four dimensions*, Nucl. Phys. B, B401 (1993), pp. 745–754.
 - [2119] P. G. LAUWERS, *Multiscale methods for computing propagators in lattice gauge theory*, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 57–76.
 - [2120] P. G. LAUWERS, R. BEN-AV, AND S. SOLOMON, *Inverting the dirac matrix for $SU(2)$ lattice gauge theory by means of parallel transported multigrid*, Nucl. Phys. B, B374 (1992), pp. 249–259.
 - [2121] P. G. LAUWERS AND T. WITTICH, *Inversion of the fermion matrix in lattice QCD by means of parallel transported multigrid (PTMG)*, Int. J. Modern Phys. C (Phys. Comput.), 4 (1993), pp. 609–620.
 - [2122] ———, *Parallel transported multigrid (PTMG) for inverting the Dirac operator in $SU(3)$ lattice gauge theory*, Nucl. Phys. B, Proc. Suppl., 30 (1993), pp. 261–264.
 - [2123] J. D. LAVERS, I. P. BOGLAEV, AND V. V. SIROTKIN, *Solution of the 2-D eddy current problem via the domain decomposition methods on serial and parallel computers*, Math. Comput. Model., 21 (1995), pp. 31–48.
 - [2124] G. F. LAWLER AND A. D. SOKAL, *Bounds on the l^2 spectrum for Markov chains and Markov processes: A generalization of Cheeger's inequality*, Trans. Amer. Math. Soc., 309 (1988), pp. 557–580.
 - [2125] S. LAWTON, D. D. WARD, S. R. CLOUDE, AND J. F. DAWSON, *Hybrid time domain modelling for automotive EMC*, in Second International Conference on Computation in Electromagnetics, 1994, pp. 275–278.
 - [2126] W. LAYTON, J. MAUBACH, AND P. RABIER, *Robust methods for highly nonsymmetric problems*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 265–270.
 - [2127] W. LAYTON AND P. RABIER, *Domain decomposition via operator splitting for highly nonsymmetric problems*, Appl. Math. Lett., 5 (1992), pp. 67–70.
 - [2128] W. J. LAYTON, A. J. MEIR, AND P. G. SCHMIDT, *A two-level discretization method for the stationary MHD equations*, Elect. Trans. Numer. Anal., 6 (1997), pp. 198–210.
 - [2129] C. LE CARLIER DE VESLUD AND G. MAURICE, *An autoadaptive solver associated with a multigrid input data on a Macintosh microcomputer*, Adv. Eng. Softw., 18 (1993), pp. 31–40.
 - [2130] C. LE CARLIER DE VESLUD, G. MAURICE, AND R. KOUTAT, *Multigrid microsoftware for engineers on a Macintosh computer*, Adv. Eng. Softw., 14 (1992), pp. 219–233.
 - [2131] V. I. LEBEDEV, *The Decomposition Method*, USSR Acad. Sci., Moscow, 1986.
 - [2132] F. LEBON AND M. RAOUS, *Multigrid method for the Coulomb friction law. Application in reactor technology*, in Proceedings Femcad-88, vol. 12, Pergamon Press, 1988, pp. 292–301.
 - [2133] ———, *Fixed point and internal multigrid method for friction problems in structural me-*

- chanics*, in Proceedings Gamni 5, vol. 1, Springer-Verlag, 1989, pp. 457–462.
- [2134] ———, *Multigrid method for contact with friction in structure assembling problems*, in Proceedings Smirt 10, vol. B, AASMIRT, 1989, pp. 197–202.
- [2135] F. LEBOU, M. RAOUS, J. C. LATIL, AND L. GREGO, *Multigrid method in non linear structure mechanics*, in New Advances in Computational Structural Mechanics, Elsevier, 1991.
- [2136] M. P. LECLERCQ, *Résolutions des 'équations d'Euler par des méthodes multigrilles conditions aux limites en régime hypersonique*, PhD thesis, Université de Saint-Étienne, 1990.
- [2137] M. P. LECLERCQ AND B. STOUFFLET, *Characteristic multigrid method application to solve the Euler equations with unstructured and unnested grids*, J. Comput. Phys., 104 (1993), pp. 329–346.
- [2138] B. LEE AND M. R. TRUMMER, *Multigrid conformal mapping via the szegő kernel*, Elect. Trans. Numer. Anal., 2 (1994), pp. 22–43.
- [2139] C.-O. LEE, *A nonconforming multigrid method using conforming subspaces*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 317–330.
- [2140] ———, *A conforming multigrid method for the pure traction problem of linear elasticity: Mixed formulation*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 455–471.
- [2141] C. O. LEE AND S. V. PARTER, *On the rate of convergence of the $k \times k$ block, k line iterative methods: k to infinity*, Numer. Math., 71 (1995), pp. 59–90.
- [2142] H. LEE, *Multigrid method for integral equations and automatic programs*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 331–343.
- [2143] H. N. LEE, *Multi-grid and step technique for atmospheric chemical pollutant transport and diffusion*, in Preliminary Proc. for Internat. Multigrid Conference, April 6–8, 1983, S. F. McCormick, ed., Ft. Collins, 1983, Institute for Computational Studies at Colorado State University.
- [2144] H. N. LEE AND R. E. MEYERS, *On time dependent multi-grid numerical techniques*, Comput. Math. Appl., 6 (1980), pp. 61–65.
- [2145] J. K. LEE, Y.-Y. CHEN, C. A. LIN, AND C. M. LU, *Modelling three-dimensional gas-turbine-combustor-model flows on a parallel machine with distributed memory*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North-Holland), Amsterdam, 1995, pp. 477–484.
- [2146] K. M. LEE AND C. C. J. KUO, *Shape from shading with a linear triangular element surface model*, IEEE Trans. Pattern Anal. Mach. Intell., 15 (1993), pp. 815–822.
- [2147] R.-T. LEE AND W.-Y. CHIOU, *Finite-element analysis of phase-change problems using multilevel techniques*, Numer. Heat Transf. B, Fundam., 27 (1995), pp. 277–290.
- [2148] B. LEER AND D. DARMOFAL, *Steady Euler solutions in $O(N)$ operations*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 24–33.
- [2149] B. LEER, W. T. LEE, P. L. ROE, K. G. POWELL, AND C. H. TAI, *Design of optimally smoothing multistage schemes for the Euler equations*, Comm. Appl. Num. Methods, 8 (1992), pp. 761–769.
- [2150] B. LEER AND W. A. MULDER, *Relaxation methods for hyperbolic conservation laws*, in Numerical Methods for the Euler Equations of Fluid Dynamics, F. Angrand, A. Dervieux, J. A. Desideri, and R. Glowinski, eds., SIAM, Philadelphia, 1985, pp. 312–333.
- [2151] B. LEER, C. H. TAI, AND K. G. POWELL, *Design of optimally smoothing multi-stage schemes for the Euler equations*, AIAA paper, 89–1933 (1989).
- [2152] P. LEINEN, *Ein schneller adaptiver Löser für elliptische Randwertprobleme*, PhD thesis, Universität Dortmund, Dortmund, 1990.
- [2153] ———, *Data structures and concepts for adaptive finite element methods*, Computing, 55 (1995), pp. 325–354.
- [2154] C. E. LEISERSON, S. RAO, AND S. TOLEDO, *Efficient out-of-core algorithms for linear relaxation using blocking covers*, in Annual Symposium on Foundations of Computer Science, Los Alamitos, CA, 1993, IEEE, Computer Society Press, pp. 704–713.
- [2155] M. LEMKE, *Multilevel Verfahren mit selbst-adaptiven Gitterverfeinerungen für Parallelrechner mit verteiltem Speicher*, PhD thesis, Universität Düsseldorf, 1993.
- [2156] M. LEMKE AND D. QUINLAN, *Fast adaptive composite grid methods on distributed parallel architectures*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 2, Denver, 1991,

- University of Colorado, pp. 61–75.
- [2157] ———, *Local refinement based fast adaptive composite grid methods on SUPRENUM, multigrid methods: special topics and applications II*, in GMD Studien Nr. 189, W. Hackbusch and U. Trottenberg, eds., GMD, Sankt Augustin, 1991, pp. 179–189.
- [2158] ———, *Fast adaptive composite grid methods on distributed parallel architectures*, Comm. Appl. Num. Methods, 8 (1992), pp. 609–619.
- [2159] ———, *P++, a C++ virtual shared grids based programming environment for architecture-independent development of structured grid applications*, in Lecture Notes in Computer Science, vol. 634, Springer–Verlag, Berlin, 1992.
- [2160] M. LEMKE, K. WITSCH, AND D. QUINLAN, *An object-oriented approach for parallel self adaptive mesh refinement on block structured grids*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 345–359.
- [2161] ———, *An object-oriented approach for parallel self adaptive mesh refinement on block structured grids*, in Adaptive Methods – Algorithms, Theory and Applications, vol. 46 of Notes on Numerical Fluid Mechanics, Braunschweig, 1994, Vieweg, pp. 199–220.
- [2162] B. LEONARD, A. PATEL, AND C. HIRSCH, *Multigrid acceleration in a 3D Navier–Stokes solver using unstructured hexahedral meshes with adaptation*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer–Verlag, pp. 150–156.
- [2163] I. LEPOUT, P. GEUZAIN, F. MEERS, J. A. ESSERS, AND J. M. VAASSEN, *Analysis of several multigrid implicit algorithms for the solution of the Euler equations on unstructured meshes*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer–Verlag, pp. 157–163.
- [2164] C. S. LEROTHEOU AND F. R. GALEA, *Fire field model implemented in a parallel computing environment*, Int. J. Numer. Meth. Fluids, 14 (1992), pp. 175–187.
- [2165] B. LESSANI, S. SMIRNOV, C. LACOR, T. BAELMANS, AND J. MEYERS, *Efficient large-eddy simulations of compressible flows using multigrid*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer–Verlag, pp. 164–170.
- [2166] P. LETALLEC AND F. MALLINGER, *Adaptive multimodel domain decomposition in fluid mechanics*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 411–425.
- [2167] P. LETALLEC, J. MANDEL, AND M. VIDRASCU, *Balancing domain decomposition for plates*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 515–524.
- [2168] ———, *Parallel domain decomposition algorithms for solving plate and shell problems*, in Advances in Parallel and Vector Processing for Structural Mechanics, Edinburgh, 1994, CIVIL-COMP Ltd. Proceedings, Athens, 1994.
- [2169] P. LETALLEC, Y.-H. ROECK, AND M. VIDRASCU, *Domain-decomposition methods for large linearly elliptic three dimensional problems*, J. Comput. Appl. Math., 34 (1991), pp. 93–117.
- [2170] P. LETALLEC, T. SASSI, AND M. VIDRASCU, *Three-dimensional domain decomposition methods with nonmatching grids and unstructured coarse solvers*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 61–74.
- [2171] R. W. LEWIS, Y. ZHENG, AND A. S. USMANI, *Aspects of adaptive mesh generation based on domain decomposition and Delaunay triangulation*, Finite Elts. Anal. Design, 20 (1995), pp. 47–70.
- [2172] Z. LEYK, *Breakdowns and stagnation in iterative methods.*, BIT, 37 (1997), pp. 377–403.
- [2173] B. LI AND K. ANASTASIOU, *Efficient elliptic solvers for the mild-slope equation using the multigrid technique*, Coastal Eng., 16 (1992), pp. 245–266.
- [2174] B. LI, D. E. REEVE, AND C. A. FLEMING, *Numerical solution of the elliptic mild-slope equation for irregular wave propagation*, Coastal Eng., 20 (1993), pp. 85–100.
- [2175] C. P. LI, *A multigrid factorization technique for the flux-split Euler equations*, in Proceedings of the Ninth International Conference on Numerical Methods in Fluid Dynamics, Soubbaramayer and J. P. Boujot, eds., vol. 218 of Lecture Notes in Physics, Berlin, 1985, Springer–Verlag.

- [2176] G. LI, *A block variant of the GMRES method for unsymmetric linear systems*, Wuhan U. J. Nat. Sci., 1 (1996), pp. 508–514.
- [2177] K. LI AND C. LI, *Convergence analysis of parallel domain decomposition algorithm for Navier-Stokes equations*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 493–500.
- [2178] P. LI AND R. L. PESKIN, *Domain decomposition for singular perturbation PDEs*, Math. Comput. Simulation, 36 (1994), pp. 443–455.
- [2179] ———, *New search method for domain decomposition for ODEs*, Math. Comput. Simulation, 36 (1994), pp. 457–466.
- [2180] W. LI, W. SUN, AND K. LIU, *Parallel multisplitting iterative methods for singular M-matrices*, Numer. Lin. Alg. Appl., 8 (2001), pp. 181–190.
- [2181] X.-J. LI AND A. D. SOKAL, *Rigorous lower bound on the dynamic critical exponent of some multigrid Swenson-Wang algorithms*, Phys. Rev. Lett., 67 (1991), pp. 1482–1485.
- [2182] Y. LI, S. HOLMBERG, A. PAPROCKI, AND Y.-Q. TANG, *Simulation of room flows with small ventilation openings in a local grid-refinement technique*, Building Serv. Eng. Res. Technol., 15 (1993), pp. 1–10.
- [2183] Y. S. LI, M. C. WRINN, J. M. NEWSAM, AND M. P. SEARS, *Parallel implementation of a mesh based density functional electronic structure code*, J. Comput. Chem., 16 (1995), pp. 226–234.
- [2184] Z.-C. LI, *Domain decomposition methods to penalty combinations for singularity problem*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 73–81.
- [2185] C. LIDDIARD, *Charge Integration and Multigrid Techniques in Semiconductor Simulation*, PhD thesis, University of Swansea, Swansea, Wales, UK, 1986.
- [2186] C. LIDDIARD AND P. MOLE, *A multigrid approach to solving Poisson's equation for a p-n diode*, in Simulation of Semiconductor Devices and Processes, vol. 3, Technoprint, Bologna, 1989, pp. 485–493.
- [2187] I. LIE, *Heterogeneous domain decomposition for acoustic bottom interaction problems*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 506–517.
- [2188] ———, *Interface conditions for heterogeneous domain decomposition: Coupling of different hyperbolic systems*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 469–476.
- [2189] I. LIE AND R. SKALIN, *Parallelism in semi Lagrangian transport*, in Proceedings of the Sixth ECMWF Workshop on the Use of Parallel Processors in Meteorology, Reading, UK, Nov. 21–25, 1994, Singapore, 1995, World Scientific, pp. 455–471.
- [2190] A. LIEGMANN AND W. FICHTNER, *Solving large sparse linear systems in a distributed computing environment*, in Parallel Processing for Scientific Computing, SIAM Proceedings, Philadelphia, 1995, SIAM, pp. 496–497.
- [2191] C. B. LIEM, T. M. SHIH, AND T. LU, *Splitting extrapolation method for solving multidimensional problems in parallel*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 267–274.
- [2192] F. S. LIEN AND M. A. LESCHZINER, *A general non orthogonal collocated finite volume algorithm for turbulent flow at all speeds incorporating second moment turbulence transport closure. 1. Computational implementation*, Comput. Meth. Appl. Mech. Engrg., 114 (1994), pp. 123–148.
- [2193] ———, *Multigrid acceleration for recirculating laminar and turbulent flows computed with a non-orthogonal, collocated finite-volume scheme*, Comput. Meth. Appl. Mech. Engrg., 118 (1994), pp. 351–371.
- [2194] ———, *Multigrid acceleration for recirculating laminar and turbulent flows computed with a non orthogonal, collocated finite volume scheme*, Comput. Methods Appl. Mech. Eng., 118 (1994), pp. 351–371.
- [2195] K. M. LIEW, K. C. HUNG, AND Y. K. SUM, *Flexural vibration of polygonal plates: treatments of sharp re-entrant corners*, J. Sound Vib., 183 (1995), pp. 221–238.
- [2196] M. A. LIMBER, T. A. MANTEUFFEL, S. F. MCCORMICK, AND D. S. SHOLL, *Optimal resolution in maximum entropy image reconstruction from projections with multigrid ac-*

- celeration*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 361–375.
- [2197] C.-M. LIN, W. PROSKUROWSKI, AND J.-L. GAUDIOT, *A parallel multigrid method for data-driven multiprocessor systems*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 299–318.
- [2198] ———, *A parallel multigrid method for data-driven multiprocessor systems*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 3, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 121–138.
- [2199] G. LIN, L. KANG, Y. CHEN, AND I. MACLEOD, *A combined technique for solution of PDE's via the generalized domain decomposition methods*, Wuhan U. J. Nat. Sci., 1 (1996), pp. 668–674.
- [2200] H. X. LIN, *Analysis and implementation of DD methods for parallel FE computations*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 407–412.
- [2201] H. X. LIN, H. H. CATE, L. DEKKER, A. W. H. M. R. T. ROEST, E. A. H. VOLLEBREGT, T. STIJN, AND J. B. BERLAMONT, *Parallel simulation of 3-D flow and transport models within the NOWESP project*, Simul. Pract. Theory, 3 (1995), pp. 257–271.
- [2202] H. X. LIN AND H. J. SIPS, *Domain decomposition for parallel finite element simulations*, in Proceedings of European Simulation Symposium Delft, Netherlands, 25–28 October 1993, Ghent, Belgium, 1993, SCS, pp. 353–358.
- [2203] S. Y. LIN AND T. M. WU, *An adaptive multigrid finite volume scheme for incompressible Navier Stokes equations*, Int. J. Numer. Meth. Fluids, 17 (1993), pp. 687–710.
- [2204] J. LINDEN, *Mehrgitterverfahren für die Poisson-Gleichung in Kreis und Ringgebiet unter Verwendung lokaler Koordinaten*, PhD thesis, Institut für Angewandte Mathematik, Universität Bonn, 1981.
- [2205] ———, *A multigrid method for solving the biharmonic equation on rectangular domains*, in Advances in Multi-Grid Methods, D. Braess, W. Hackbusch, and U. Trottenberg, eds., vol. 11 of Notes on Numerical Fluid Mechanics, Braunschweig, 1984, Vieweg, pp. 64–76.
- [2206] ———, *Mehrgitterverfahren für das erste Ramdwertproblem der biharmonischen Gleichung und Anwendung auf ein einkompressibles Strömungsproblem*, PhD thesis, Institut für Angewandte Mathematik, Universitat Bonn, 1985.
- [2207] ———, *Multigrid algorithms for general Navier-Stokes solution*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 3, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 139–151.
- [2208] J. LINDEN, G. LONSDALE, H. RITZDORF, AND A. SCHULLER, *Scalability aspects of parallel multigrid*, Future Gener. Comput. Syst., 10 (1994), pp. 429–439.
- [2209] J. LINDEN, B. STECKEL, AND K. STÜBEN, *Parallel multigrid solution of Navier-Stokes equations on general 2D domains*, Parallel Comput., 7 (1988), pp. 461–475.
- [2210] J. LINDEN, U. TROTTERBERG, AND K. WITSCH, *Multigrid computation of the pressure of an incompressible fluid in a rotating spherical gap*, in Proc. Fourth GAMM-Conference on Numerical Methods in Fluid Mechanics, H. Viviand, ed., Braunschweig, 1982, Vieweg, pp. 183–193.
- [2211] J.-L. LIONS, *Contrôle Optimal des Systèmes Gouvernés par des Équations aux Dérivées Partielles*, Dunod, Paris, 1968.
- [2212] J.-L. LIONS AND E. MAGENES, *Problèmes aux Limites non Homogènes et Applications*, V. I. Dunod, Paris, 1968.
- [2213] ———, *Nonhomogenous Boundary Value Problems and Applications*, vol. 1, Springer, New York, Heidelberg, Berlin, 1972.
- [2214] P.-L. LIONS, *Interprétation stochastique de la méthode alternée de Schwarz*, C.R. Acad. Sci. Paris, 268 (1978), pp. 325–328.
- [2215] ———, *On the Schwarz alternating method I*, in First International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. Périaux, eds., Philadelphia, 1988, SIAM, pp. 1–42.
- [2216] ———, *On the Schwarz alternating method II: Stochastic interpretation and order properties*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B.

- Widlund, eds., SIAM, Philadelphia, 1989, pp. 47–70.
- [2217] ———, *On the Schwarz alternating method III: a variant for nonoverlapping subdomains*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1990, SIAM, pp. 202–223.
- [2218] P.-L. LIONS AND B. MERCIER, *Splitting algorithms for the sum of two nonlinear operators*, SIAM J. Numer. Anal., 16 (1979), pp. 964–979.
- [2219] J. LIOU AND T. E. TEZDUYAR, *Combined AIE/EBE/GMRES approach to incompressible flows*, in Proceedings of the Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1990, SIAM, pp. 462–486.
- [2220] ———, *A clustered element-by-element iteration method for finite element computations*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 140–150.
- [2221] V. D. LISEIKIN, *Grid Generation Methods*, Scientific Computation, Springer-Verlag, Berlin, 1999.
- [2222] I. S. LITVINCHEV, *Decomposition aggregation and parallel computations in large scale extremal problems*, Adv. Eng. Softw., 22 (1995), pp. 21–27.
- [2223] C. LIU, *The finite volume element (FVE) and fast adaptive composite grid methods (FAC) for the incompressible Navier–Stokes equations*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 319–337.
- [2224] ———, *The finite volume element (FVE) and fast adaptive composite grid methods (FAC) for the incompressible Navier–Stokes equations*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 3, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 153–173.
- [2225] C. LIU AND Z. LIU, *High order finite difference and multigrid methods for spatially evolving instability in a planar channel*, J. Comput. Phys., 106 (1993), pp. 92–100.
- [2226] ———, *Multigrid mapping and box relaxation for simulation of the whole process of flow transition in 3D boundary layers*, J. Comput. Phys., 119 (1995), pp. 325–341.
- [2227] ———, *Multiple scale simulation for transitional and turbulent flow*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 473–487.
- [2228] C. LIU, Z. LIU, AND S. F. MCCORMICK, *Multigrid methods for flow transition in a planar channel*, Comput. Phys. Commun., 65 (1991), pp. 188–200.
- [2229] ———, *Multilevel adaptive methods for incompressible flow in grooved channels*, J. Comput. Appl. Math., 38 (1991), pp. 283–295.
- [2230] ———, *Multilevel adaptive methods for incompressible flow in grooved channels*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 2, Denver, 1991, University of Colorado, pp. 103–120.
- [2231] ———, *An efficient multigrid scheme for elliptic equations with discontinuous coefficients*, Comm. Appl. Num. Methods, 8 (1992), pp. 621–631.
- [2232] ———, *Multigrid methods for numerical simulation of laminar diffusion flames*, AIAA, 93-0236 (1993), pp. 1–11.
- [2233] ———, *Multilevel adaptive methods for laminar diffusion flames*, J. Sci. Comput., 8 (1993), pp. 341–355.
- [2234] C. LIU AND S. F. MCCORMICK, *Multigrid, elliptic grid generation and the fast adaptive composite grid method for solving transonic potential flow equations*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 365–387.
- [2235] F. LIU AND A. JAMESON, *Multigrid Navier Stokes calculations for three dimensional cascades*, AIAA J., 31 (1993), pp. 1785–1791.
- [2236] F. LIU AND X. ZHENG, *A strongly coupled time marching method for solving the Navier Stokes and k omega turbulence model equations with multigrid*, J. Comput. Phys., 128 (1996), pp. 289–300.
- [2237] W. LIU, D. DONG, Y. KIMURA, AND K. O. OKADA, *Elastohydrodynamic lubrication with water-in-oil emulsions*, Wear, 179 (1994), pp. 17–21.

- [2238] W. K. LIU, *Development of mixed time partition procedures for thermal analysis of structures*, Int. J. Numer. Meth. Engng., 19 (1983), pp. 125–140.
- [2239] W. K. LIU AND T. BELYTSCHKO, *Mixed time implicit-explicit finite elements for transient analysis*, Comput. Struct., 15 (1982), pp. 445–450.
- [2240] W. K. LIU AND Y. CHEN, *Wavelet and multiple scale reproducing kernel methods*, Int. J. Numer. Methods Fluids, 21 (1995), pp. 901–931.
- [2241] Z. LIU AND C. LIU, *Fourth order finite difference and multigrid methods for modeling instabilities in flat plate boundary layers*, J. Comput. Wind. Eng., 52 (1992), pp. 412–417.
- [2242] ———, *Fourth order finite difference and multigrid methods for modeling instabilities in 2-dimensional flat plate boundary layers*, J. Wind Eng. Industrial Aerodyn., 46–47 (1993), pp. 265–274.
- [2243] ———, *Fourth order finite difference and multigrid methods for modeling instabilities in flat plate boundary layers – 2-D and 3-D approaches*, Comput. Fluids, 23 (1994), pp. 955–982.
- [2244] Z. LIU, C. LIU, AND S. F. MCCORMICK, *Flow transition with 2-D roughness elements in a 3-D channel*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 377–391.
- [2245] Z. LIU, Z. LIU, C. LIU, AND S. F. MCCORMICK, *Multilevel methods for temporal and spatial flow transition simulation in a rough channel*, Int. J. Numer. Methods Fluids, 19 (1994), pp. 23–40.
- [2246] I. M. LLORENTE AND N. D. MELSON, *Behavior of plane relaxation methods as multigrid smoothers*, Elect. Trans. Numer. Anal., 10 (2000), pp. 92–114.
- [2247] T. P. LOC AND R. BOUARD, *Numerical solution of the early stage of the unsteady viscous flow around a circular cylinder; a comparison with experimental visualization and measurements*, J. Fluid Mech., 160 (1985), pp. 93–117.
- [2248] R. LÖHNER AND K. MORGAN, *An unstructured multigrid method for elliptic problems*, Int. J. Numer. Meth. Engng., 24 (1987), pp. 101–115.
- [2249] ———, *Domain decomposition for the simulation of transient problems in CFD*, in First International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. Péliaux, eds., Philadelphia, 1988, SIAM, pp. 426–431.
- [2250] R. LÖHNER, K. MORGAN, AND O. C. ZIENKIEWICZ, *The use of domain splitting with an explicit hyperbolic solver*, Comp. Meth. Appl. Mech. Engng., 45 (1984), pp. 313–329.
- [2251] E. LOLI PICCOLOMINI, F. ZAMA, AND V. RUGGIERO, *A domain decomposition method for scattered data approximation on a multiprocessor system*, in Proceedings of ParCo93. Parallel Computing 93, Grenoble, France, September 7–10, 1993, Amsterdam, 1994, Elsevier, pp. 193–200.
- [2252] H. LOMAX, J. PULLIAM, AND D. C. JESPERSEN, *Eigenvalue analysis techniques for finite-difference equation. I. Multigrid techniques*, AIAA, 81–1027 (1981), pp. 55–80.
- [2253] C. K. LOMBARD, J. OLIGER, AND J. Y. YANG, *A natural conservative flux difference splitting for the hyperbolic systems of gas dynamics*, AIAA, 82–0976 (1982).
- [2254] C. A. LONG, A. P. MORSECAND, AND P. G. TUCKER, *Measurement and computation of heat transfer in high pressure compressor drum geometries with axial throughflow*, in Proceedings of the International Gas Turbine and Aeroengine Congress and Exposition, vol. 95-GT-185, New York, 1995, American Society of Mechanical Engineers, p. 16.
- [2255] C. A. LONG AND P. G. TUCKER, *Numerical computation of laminar flow in a heated rotating cavity with an axial throughflow of air*, Int. J. Numer. Methods Heat Fluid Flow, 4 (1994), pp. 347–365.
- [2256] J. M. LONGO, W. SCHMIDT, AND A. JAMESON, *Viscous transonic airfoil flow simulation*, Z. Flugw. Weltraumforsch., 7 (1983), pp. 47–56.
- [2257] G. LONSDALE, *Multigrid methods for the solution of the Navier–Stokes equations*, PhD thesis, University of Manchester, 1985.
- [2258] G. LONSDALE AND A. SCHULLER, *Multigrid efficiency for complex flow simulations on distributed memory machines*, Parallel Comput., 19 (1993), pp. 23–32.
- [2259] R. D. LONSDALE, *Algebraic multigrid solver for the Navier–Stokes equations on unstructured meshes*, Int. J. Numer. Meth. Heat Fluid Flow, 3 (1993), pp. 3–14.
- [2260] T. LOOS AND R. BRAMLEY, *A new model for the data distribution problem*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 636–646.
- [2261] R. LORENTZ AND P. OSWALD, *Multilevel finite element Riesz bases in Sobolev spaces*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org,

- pp. 178–187.
- [2262] M. LORIOT AND L. FEZOUI, *FEM/FVM calculations of compressible flows on a Meiko system*, Future Generation Computer Systems, 11 (1995), pp. 7–18.
 - [2263] P. LOTSTEDT AND B. GUSTAFSSON, *Fourier analysis of multigrid methods for general systems of PDES*, Math. Comp., 60 (1993), pp. 473–493.
 - [2264] H. LÖTZBEYER AND U. RÜDE, *Patch-adaptive multilevel iteration*, BIT, 37 (1997), pp. 739–758.
 - [2265] J. Z. LOU, *A parallel incompressible Navier Stokes solver with multigrid iterations*, in Parallel Processing for Scientific Computing, SIAM Proceedings, Philadelphia, 1995, SIAM, pp. 167–168.
 - [2266] M. LOUTER NOOL, *A parallel multigrid code with a fast vectorized ILU relaxation*, Future Gener. Comput. Syst., 10 (1994), pp. 309–313.
 - [2267] T. LU, P. NEITTANMÄKI, AND X.-C. TAI, *A parallel splitting up method and its application to Navier–Stokes equations*, Appl. Math. Lett., 4 (1991), pp. 25–29.
 - [2268] ———, *A parallel splitting up method for partial differential equations and its application to Navier–Stokes equations*, RAIRO Math. Model. Numer. Anal., 26 (1992), pp. 673–708.
 - [2269] T. LU, T. M. SHIH, AND C. B. LIEM, *Parallel algorithms for solving partial differential equations*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 71–80.
 - [2270] G. LUBE, L. MÜLLER, AND H. MÜLLER, *A new nonoverlapping domain decomposition method for stabilized finite element methods applied to the nonstationary Navier–Stokes equations*, Numer. Lin. Alg. Appl., 7 (2000), pp. 449–472.
 - [2271] C. LUBICH AND A. OSTERMANN, *Multi-grid dynamic iteration for parabolic equations*, BIT, 27 (1987), pp. 216–234.
 - [2272] A. A. LUBRECHT, *The Numerical Solution of the Elastohydrodynamically Lubricated Line- and Point Contact Using Multigrid Techniques*, PhD thesis, Technische Univ. Twente, Enschede, The Netherlands, 1987.
 - [2273] ———, *Multilevel multi-integration, an introduction*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 3, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 175–185.
 - [2274] P. LUCHINI, *A deferred correction multigrid algorithm based on a new smoother for the Navier Stokes equations*, J. Comput. Phys., 92 (1991), pp. 349–368.
 - [2275] P. LUCHINI AND A. D’ALASCIO, *Multigrid pressure correction techniques for the computation of quasi incompressible internal flows*, Int. J. Numer. Meth. Fluids, 18 (1994), pp. 489–507.
 - [2276] P. M. LUGT, *Lubrication in Cold Rolling: Numerical Simulation Using Multigrid Techniques*, PhD thesis, Technische Univ. Twente, Enschede, The Netherlands, 1992.
 - [2277] Y. LUH, *Diskretisierungen und Mehrgitteralgorithmen zur numerischen Lösung hyperbolischer Differentialgleichungen, am Beispiel der Wellengleichung, der Advektionsgleichung und der verallgemeinerten Stokes-Gleichungen*, PhD thesis, Rheinische Friedrich-Wilhelms-Universität Bonn, 1992.
 - [2278] S. H. LUI, *Some recent results on domain decomposition methods for eigenvalue problems*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 426–433.
 - [2279] E. LUO, *Multigrid Methods for Elliptic Equation with Oscillatory Coefficients*, PhD thesis, UCLA, Los Angeles, 1993.
 - [2280] J.-C. LUO, *Solving Eigenvalue problems by implicit decomposition*, Numer. Meth. for PDE, 7 (1991), pp. 113–145.
 - [2281] ———, *A domain decomposition method for eigenvalue problems*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 306–321.
 - [2282] ———, *Formulation of the finite element method by domain decomposition*, Comput. Struct., 43 (1992), pp. 751–760.
 - [2283] J.-C. LUO AND M. B. FRIEDMAN, *A study on decomposition methods*, Comput. Math. Appl., 21 (1991), pp. 79–84.
 - [2284] K. LUST, J. DEKEYSER, AND D. ROOSE, *A parallel block-structured Euler/Navier-Stokes code with adaptive refinement and run-time load balancing on the iPSC-860 hypercube*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North-Holland), Amsterdam, 1995, pp. 243–250.
 - [2285] L. R. LUSTMAN, Q. HUYNH, AND M. Y. HUSSAINI, *Multigrid method with weighted mean*

- scheme*, in Multigrid Methods, H. Lomax, ed., NASA Conference Publication 2202, Ames Research Center, Moffett Field, CA, 1982, pp. 47–59.
- [2286] N. J. LYBECK AND K. L. BOWERS, *Domain decomposition via the Sinc-Galerkin method for second order differential equations*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 271–276.
- [2287] J. D. M. DAYDE AND N. GOULD, *Subspace-by-subspace preconditioners for structured linear systems*, Numer. Lin. Alg. Appl., 6 (1999), pp. 213–234.
- [2288] L. MA AND Q. CHANG, *Compensation method of an optimal-order Wilson nonconforming multigrid*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 221–226.
- [2289] H. T. M. MAAREL, *Adaptive multigrid for the steady Euler equations*, Comm. Appl. Num. Methods, 8 (1992), pp. 749–760.
- [2290] ———, *Local Grid Refinement Method for the Euler Equations*, PhD thesis, University of Amsterdam, The Netherlands, 1993.
- [2291] M. G. MACARAEG AND C. L. STREETT, *Improvements in spectral collocation discretization through a multiple domain technique*, Appl. Numer. Math., 2 (1986), pp. 95–108.
- [2292] ———, *An analysis of artificial viscosity effects on reacting flows using a spectral multi-domain technique*, Elsevier Science publishers B.V. (North-Holland), Amsterdam, 1988.
- [2293] ———, *A spectral multi-domain technique for viscous compressible reacting flow*, Int. J. Numer. Meth. Fluids, 8 (1988), pp. 1121–1134.
- [2294] M. G. MACARAEG, C. L. STREETT, AND M. Y. HUSSAINI, *A spectral multi-domain technique applied to high-speed chemically reacting flows*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 361–391.
- [2295] G. MACK, *Multigrid methods in quantum field theory*, in Nonperturbative Quantum Field Theory, G. 't Hooft et al., ed., vol. 185 of NATO ASI Series, Series B: Physics, New York, 1988, Plenum Press, pp. 309–351.
- [2296] G. MACK, T. KALKREUTER, G. PALMA, AND M. SPEH, *Effective field theories*, in Proceedings of the 31. Internationale Universitätswochen für Kern- und Teilchenphysik, Schladming, Austria, 1992, H. Gausterer and C. B. Lang, eds., vol. 409 of Lecture Notes in Physics, Berlin, 1992, Springer, pp. 205–250.
- [2297] J. A. MACKENZIE, E. SÜLI, AND G. WARNECKE, *A posteriori error estimates for the cell-vertex finite volume method*, in Adaptive Methods – Algorithms, Theory and Applications, vol. 46 of Notes on Numerical Fluid Mechanics, Braunschweig, 1994, Vieweg, pp. 221–235.
- [2298] Y. MADAY, C. MAVRIPLIS, AND A. T. PATERA, *Nonconforming mortar element methods: Application to spectral discretizations*, in Intl. Symp. on Domain Decomposition Methods, T. F. Chan, ed., Philadelphia, 1988, SIAM, pp. 392–418.
- [2299] Y. MADAY, D. MEIRON, A. T. PATERA, AND E. M. RØNQUIST, *Analysis of iterative methods for steady and unsteady Stokes problem: Application of spectral element discretization*, SIAM J. Sc. Comp., 14 (1993), pp. 301–337.
- [2300] Y. MADAY AND R. MUÑOZ, *Spectral element multigrid. II. Theoretical justification*, J. Sci. Comput., 3 (1988), pp. 323–352.
- [2301] Y. MADAY AND A. T. PATERA, *Nonconforming mortar element methods: Application to spectral discretizations*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1989, SIAM, pp. 392–418.
- [2302] R. MAHNKEN, *Newton-multigrid algorithm for elasto-plastic/viscoplastic problems*, Comput. Mech., 15 (1995), pp. 408–425.
- [2303] M. MAISCHAK, E. P. STEPHAN, AND T. TRAN, *Two-level Schwarz methods for indefinite integral equations*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 504–508.
- [2304] J. F. MAITRE AND F. MUSY, *The contraction number of a class of two-level methods; an exact evaluation for some finite element subspaces and model problems*, in Multigrid Methods, W. Hackbusch and U. Trottenberg, eds., vol. 960 of Lecture Notes in Mathematics, Berlin, 1982, Springer-Verlag, pp. 535–544.
- [2305] ———, *Méthodes multigrilles: opérateur associé et estimations du facteur de convergence; le cas du V-cycle*, C.R. Acad. Sci. Paris, Ser. I, 296 (1983), pp. 521–524.
- [2306] ———, *Multigrid methods: convergence theory in a variational framework*, SIAM J. Numer. Anal., 21 (1984), pp. 657–671.

- [2307] ———, *Algebraic formalisation of the multigrid method in the symmetric and positive definite case—a convergence estimation for the V-cycle*, in Multigrid Methods for Integral and Differential Equations, D. J. Paddon and H. Holstein, eds., vol. 3 of The Institute of Mathematics and its Applications Conference Series, Clarendon Press, Oxford, 1985, pp. 213–224.
- [2308] J. F. MAITRE, F. MUSY, AND P. NIGNON, *A fast solver for the Stokes equations using multigrid with a UZAWA smoother*, in Advances in Multi-Grid Methods, D. Braess, W. Hackbusch, and U. Trottenberg, eds., vol. 11 of Notes on Numerical Fluid Mechanics, Braunschweig, 1984, Vieweg, pp. 77–83.
- [2309] S. MAJUMDAR, *Role of underrelaxation in momentum interpolation for calculation of flow with nonstaggered grids*, Numer. Heat Transf., 13 (1988), pp. 125–132.
- [2310] S. MALHOTRA, *Topics in Multigrid Methods*, PhD thesis, Yale University, Department of Computer Science, New Haven, CT, 1996.
- [2311] S. MALIASSOV, *A note on substructuring preconditioning for nonconforming finite element approximations of second order elliptic problems*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 489–501.
- [2312] ———, *Optimal Order Preconditioners for Mixed and Nonconforming Finite Element Approximations of Elliptic Problems with Anisotropy*, PhD thesis, Texas A&M, College Station, TX, 1996.
- [2313] S. G. MALLAT, *Multifrequency channel decompositions of images and wavelet models*, IEEE Trans. Acoust. Signal Speech Process, 37 (1989), pp. 2091–2110.
- [2314] I. G. MAMEDOVA AND V. A. SEREBRYAKOV, *Parallel programming of boundary valued problems for the Poisson and Helmholtz equations by a multigrid algorithm*, Program-mirovanie, 21 (1995).
- [2315] J. C. MANDAL AND H. S. RAJPUT, *An improved multigrid method for Euler equations*, J. Comput. Mech., 23 (1999), pp. 397–403.
- [2316] J. MANDEL, *Convergence of an iterative method for the system $Ax + y = x$ using aggregation*, Ekonom.-Mat. Obzor., 17 (1981), pp. 287–291.
- [2317] ———, *A convergence analysis of the iterative aggregation method with one parameter*, J. Lin. Alg. Applic., 59 (1984), pp. 159–169.
- [2318] ———, *Etude algébrique d'une méthode multigrille pour quelques problèmes de frontière libre*, C.R. Acad. Sci. Paris, 298 (1984), pp. 469–472. Sometimes cited as Algebraic study of a multigrid method for some free boundary problem.
- [2319] ———, *A multi-level iterative method for symmetric, positive definite linear complementarity problems*, Appl. Math. Optim., 11 (1984), pp. 77–95.
- [2320] ———, *On some two-level iterative methods*, in Defect Correction Methods: Theory and Applications, K. Böhmer and H. J. Stetter, eds., Computing Suppl. 5, Springer-Verlag, Vienna, 1984, pp. 75–88.
- [2321] ———, *On multilevel iterative methods for integral equations of the second kind and related problems*, Numer. Math., 46 (1985), pp. 147–157.
- [2322] ———, *Multigrid convergence for nonsymmetric, indefinite variational problems and one smoothing step*, Appl. Math. Comput., 19 (1986), pp. 201–216.
- [2323] ———, *On multigrid and iterative aggregation methods for nonsymmetric problems*, in Multigrid Methods II, W. Hackbusch and U. Trottenberg, eds., Berlin, 1986, Springer-Verlag, pp. 219–231.
- [2324] ———, *On multigrid and iterative aggregation methods for nonsymmetric problems*, in Multigrid Methods II, W. Hackbusch and U. Trottenberg, eds., Springer-Verlag, Berlin, 1987, pp. 219–231.
- [2325] ———, *Algebraic study of multigrid methods for symmetric, definite problems*, Appl. Math. Comput., 25 (1988), pp. 39–56.
- [2326] ———, *Two-level domain decomposition preconditioning for the p-version finite element method in three dimensions*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 4, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 1–16.
- [2327] ———, *Hierarchical preconditioning and partial orthogonalization for the p-version finite element method*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1990, SIAM Books, pp. 141–156.
- [2328] ———, *Iterative solvers by substructuring for the p-version finite element method*, Comput. Meth. Appl. Mech. Engrg., 80 (1990), pp. 117–128.
- [2329] ———, *On block diagonal and Schur complement preconditioning*, Numer. Math., 58 (1990),

- pp. 79–93.
- [2330] ———, *Two-level domain decomposition preconditioning for the p-version finite element method in three dimensions*, Int. J. Numer. Meth. Engng., 29 (1990), pp. 1095–1108.
- [2331] ———, *Fast iterative solver for finite elements using incomplete elimination*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 2, Denver, 1991, University of Colorado, pp. 263–282.
- [2332] ———, *Some recent advances in multigrid methods*, in Advances in Electronics and Electron Physics, P. S. Hawkes, ed., vol. 82, Academic Press, New York, 1991, pp. 327–377.
- [2333] ———, *Adaptive iterative solvers in finite elements*, in Solving Large Scale Problems in Mechanics. The Development and Application of Computational Solution Methods, M. Papadrakakis, ed., J. Wiley & Sons, London, 1993, pp. 65–88.
- [2334] ———, *Balancing domain decomposition*, Comm. Numer. Meth. Engrg., 9 (1993), pp. 233–241.
- [2335] ———, *Intelligent block iterative methods*, in FEM Today and the Future, J. Robinson, ed., Okehampton, Devon EX20 4NT, England, 1993, Robinson and Associates.
- [2336] ———, *Hybrid domain decomposition with unstructured subdomains*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 103–112.
- [2337] J. MANDEL AND G. S. LETT, *Domain decomposition preconditioning for p-version finite elements with high aspect ratios*, Appl. Numer. Anal., 8 (1991), pp. 411–425.
- [2338] J. MANDEL AND S. F. MCCORMICK, *Iterative solution of elliptic equations with refinement: the model multi-level case*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1989, SIAM Books, pp. 93–102.
- [2339] ———, *Iterative solution of elliptic equations with refinement: The two-level case*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1989, SIAM, pp. 81–92.
- [2340] ———, *A multilevel variational method for $Au = \lambda Bu$ on composite grids*, J. Comput. Phys., 80 (1989), pp. 442–452.
- [2341] ———, *Preliminary Proceedings of the 4th Copper Mountain Conference on Multigrid Methods*, University of Colorado, Denver, 1991.
- [2342] J. MANDEL, S. F. MCCORMICK, AND R. E. BANK, *Variational multigrid theory*, in Multigrid Methods, S. F. McCormick, ed., vol. 3 of Frontiers in Applied Mathematics, SIAM Books, Philadelphia, 1987, pp. 131–177.
- [2343] J. MANDEL, S. F. MCCORMICK, J. E. DENDY, C. FARHAT, G. LONSDALE, S. V. PARTER, J. W. RUGE, AND K. STÜBEN, *Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods*, SIAM, Philadelphia, 1989.
- [2344] J. MANDEL, S. F. MCCORMICK, AND J. W. RUGE, *An algebraic theory for multigrid methods for variational problems*, SIAM J. Numer. Anal., 25 (1988), pp. 91–110.
- [2345] J. MANDEL AND W. L. MIRANKER, *New techniques for fast hybrid solution of systems of equations*, Int. J. Numer. Meth. Engng., 27 (1990), pp. 455–468.
- [2346] J. MANDEL AND H. OMBE, *Fourier analysis of a multigrid method for 3D elasticity*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 389–411.
- [2347] J. MANDEL AND S. V. PARTER, *On the multigrid F-cycle*, Appl. Math. Comput., 37 (1990), pp. 19–36.
- [2348] J. MANDEL AND B. SEKERKA, *A local convergence proof for the iterative aggregation method*, J. Lin. Alg. Applic., 51 (1983), pp. 163–172.
- [2349] J. MANDEL AND R. TEZAUR, *Convergence of a substructuring method with Lagrange multipliers*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 503–518.
- [2350] L. MANSFIELD, *On the solution of nonlinear finite element systems*, SIAM J. Numer. Anal., 17 (1980), pp. 752–765.
- [2351] ———, *On the multi-grid solution of finite element equations with isoparametric elements*, Numer. Math., 37 (1981), pp. 423–432.
- [2352] ———, *On the conjugate gradient solution of the Schur complement system obtained from domain decomposition*, SIAM J. Numer. Anal., 27 (1990), pp. 1612–1620.
- [2353] ———, *Solution of the Stokes problem on distributed-memory multiprocessors*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equa-

- tions, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 394–400.
- [2354] D. MANSUTTI AND F. PITOLLI, *Simulation of 3D Navier–Stokes flows via domain decomposition by the modified discrete vector potential model*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 477–482.
- [2355] T. A. MANTEUFFEL AND S. F. MCCORMICK, *Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods*, University of Colorado, Denver, 1991.
- [2356] T. A. MANTEUFFEL, S. F. MCCORMICK, J. MOREL, S. OLIVEIRA, AND G. YANG, *A parallel version of a multigrid algorithm for isotropic transport equations*, SIAM J. Sci. Comput., 15 (1994), pp. 474–493.
- [2357] ———, *A fast multigrid algorithm for isotropic transport problems. I. Pure scattering*, SIAM J. Sci. Comput., 16 (1995), pp. 601–635.
- [2358] T. A. MANTEUFFEL, S. F. MCCORMICK, AND G. STARKE, *First-order system least-squares for second order elliptic problems with discontinuous coefficients*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 535–550.
- [2359] T. A. MANTEUFFEL AND K. RESSEL, *Multilevel methods for transport equations in diffusive regimes*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 393–403.
- [2360] T. A. MANTEUFFEL AND K. J. RESSEL, *A systematic solution approach for neutron transport problems in diffusive regimes*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 519–534.
- [2361] T. A. MANTEUFFEL, G. STARKE, AND R. S. VARGA, *Adaptive k-step iterative methods for nonsymmetric systems of linear equations*, Elect. Trans. Numer. Anal., 3 (1995), pp. 50–65.
- [2362] M. MARCANO, *The numerical solution of the von K'arm'an equations using multigrid methods*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 1, Denver, 1991, University of Colorado, pp. 253–273.
- [2363] M. J. MARCHANT AND N. P. WEATHERILL, *Construction of nearly orthogonal multiblock grids for compressible flow simulation*, Comm. Numer. Meth. Engrg., 9 (1993), pp. 567–578.
- [2364] G. I. MARCHUK, *Splitting and alternating direction methods*, in Handbook of Numerical Analysis, P. G. Ciarlet and J.-L. Lions, eds., vol. 1, North–Holland, Amsterdam, 1990, pp. 197–462.
- [2365] G. I. MARCHUK AND Y. A. KUZNETSOV, *Approximate algorithms for implicit difference schemes*, in Analyse Mathematique et Applications, Gauthier–Villars, Paris, 1988, pp. 357–371.
- [2366] G. I. MARCHUK, Y. A. KUZNETSOV, AND A. M. MATSOKIN, *Fictitious domain and domain decomposition methods*, Sov. J. Numer. Anal. Math. Modeling, 1 (1986), pp. 3–35.
- [2367] L. MARCINKOWSKI, *The mortar element method with locally nonconforming elements*, BIT, 39 (1999), pp. 716–739.
- [2368] S. MARGENOV, *Semi-coarsening AMLI algorithms for elasticity problems*, in AMLI'96: Proceedings of the Conference on Algebraic Multilevel Iteration Methods with Applications, vol. 2, Nijmegen, The Netherlands, 1996, University of Nijmegen, pp. 179–193.
- [2369] L. D. MARINI AND A. QUARTERONI, *An iterative procedure for domain decomposition methods: a finite element approach*, in First International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. Périaux, eds., Philadelphia, 1988, SIAM, pp. 129–143.
- [2370] ———, *A relaxation procedure for domain decomposition methods using finite elements*, Numer. Math., 55 (1989), pp. 575–598.
- [2371] J. P. MARTINAUD, *Approximation élément finis d'équations aux dérivées partielles par une méthode de décomposition de domaines. Applications aux équations de Stokes et Saint-Venant*, PhD thesis, Université Paris VI, 1984.
- [2372] L. MARTINELLI AND A. JAMESON, *Validation of a multigrid method for the Reynolds averaged equations*, AIAA Paper, 88–0414 (1988).
- [2373] Y. P. MARX, *Multigrid solution of the advection–diffusion equation with variable coefficients*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Meth-

- ods, T. A. Manteuffel and S. F. McCormick, eds., vol. 2, Denver, 1991, University of Colorado, pp. 121–136.
- [2374] ———, *Multigrid solution of the advection-diffusion equation with variable coefficients*, Comm. Appl. Num. Methods, 8 (1992), pp. 633–650.
- [2375] Y. P. MARX AND J. PIQUET, *Towards multigrid acceleration of 2d compressible Navier-Stokes finite volume implicit schemes*, in Robust Multi-Grid Methods, W. Hackbusch, ed., vol. 23 of Notes on Numerical Fluid Mechanics, Braunschweig, 1989, Vieweg, pp. 178–187.
- [2376] L. R. MATHESON AND R. E. TARJAN, *Analysis of multigrid methods on massively parallel computers: architectural implications*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 405–421.
- [2377] ———, *Parallelism in multigrid methods: how much is too much?*, Int. J. Paral. Prog., 24 (1996), pp. 397–432.
- [2378] T. P. MATHEW, *Domain Decomposition and Iterative Refinement Methods for Mixed Finite Element Discretizations of Elliptic Problems*, PhD thesis, New York University, New York City, 1989.
- [2379] ———, *Schwarz alternating and iterative refinement methods for mixed formulations of elliptic problems, part I: algorithms and numerical results*, Numer. Math., (1993), pp. 445–468.
- [2380] ———, *Schwarz alternating and iterative refinement methods for mixed formulations of elliptic problems, part II: theory*, Numer. Math., (1993), pp. 468–492.
- [2381] D. MATOVIC, A. POLLARD, H. A. BECKER, AND E. W. GRANDMAISON, *FAS multigrid calculations of three dimensional flow using non-staggered grids*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 17–29.
- [2382] A. M. MATSOKIN, *Fictitious component method and the modified difference analogue of the Schwarz method*, in Vychislitel'nye Metody Lineinoi Algebry, G. I. Marchuk, ed., Vychisl. Tsentr. Sib. Otdel. Akad. Nauk. SSR, Novosibirsk, 1980, pp. 66–77. Sov. J. Numer. Anal. Math. Modeling, 4 (1989).
- [2383] ———, *Relation of the bordering method with the fictitious components method and the subdomain alternating method*, in Differential Equations with Partial Derivatives, Novosibirsk, 1986.
- [2384] ———, *Norm preserving prolongations of mesh function*, Sov. J. Numer. Anal. Math. Modeling, 3 (1988), pp. 137–149.
- [2385] A. M. MATSOKIN AND S. V. NEPOMNYASCHIKH, *On the convergence of the alternating subdomain Schwarz method without intersections*, in Metody Interpolyatsii i Approksimatsii, Y. A. Kuznetsov, ed., Vychisl. Tsentr. Sib. Otdel. Akad. Nauk SSSR, Novosibirsk, 1981.
- [2386] ———, *A Schwarz alternating method in subspaces*, In. Vuzov, 10 (1985), pp. 61–66. Also in Soviet Mathematics, 10 (1985), pp. 78–84.
- [2387] ———, *Norms in the space of traces of mesh functions*, Sov. J. Numer. Anal. Math. Modeling, 3 (1988), pp. 199–216.
- [2388] ———, *Method of fictitious space and explicit extension operators*, Z. Vycisl. Mat. i. Mat. Fiz., 33 (1993), pp. 52–68.
- [2389] R. MATTIS AND A. HAGHIGHAT, *Domain decomposition of a two-dimensional S^n method*, Nucl. Sci. Eng., 111 (1992), pp. 180–196.
- [2390] D. J. MAVRIPLIS, *Multigrid solution of the two-dimensional Euler equations on unstructured triangular meshes*, AIAA J., 26 (1988), pp. 824–831.
- [2391] ———, *Zonal multigrid solution of compressible flow problems on unstructured and adaptive meshes*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 3, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 17–24.
- [2392] ———, *Accurate multigrid solution of the Euler equations on unstructured and adaptive meshes*, AIAA J., 8 (1990), pp. 213–221.
- [2393] ———, *Algebraic turbulence modeling for unstructured and adaptive meshes*, AIAA J., 29 (1991), pp. 2086–2093.
- [2394] ———, *Three dimensional multigrid for the Euler equations*, in Proc. AIAA 10th Comp. Fluid Dynamics Conf. Honolulu, 1991, pp. 239–248.
- [2395] ———, *Turbulent flow calculations using unstructured and adaptive meshes*, Int. J. Numer. Meth. Fluids, 13 (1991), pp. 1131–1152.
- [2396] ———, *Three-dimensional unstructured multigrid for the Euler equations*, AIAA J., 30 (1992), pp. 1753–1761.

- [2397] ———, *Three-dimensional multigrid Reynolds-averaged Navier-Stokes solver for unstructured meshes*, AIAA J., 33 (1995), pp. 445–453.
- [2398] ———, *Directional coarsening and smoothing for anisotropic Navier-Stokes problems*, Elect. Trans. Numer. Anal., 6 (1997), pp. 182–197.
- [2399] D. J. MAVRIPLIS AND A. JAMESON, *Multi-grid solution of the two-dimensional Euler equations on unstructured triangular meshes*, AIAA, 87-0353 (1987).
- [2400] ———, *Multi-grid solution of the two-dimensional Euler equations on unstructured triangular meshes*, AIAA J., 26 (1988), pp. 824–831.
- [2401] ———, *Multigrid solution of the Euler equations on unstructured and adaptive meshes*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 413–429.
- [2402] ———, *Multigrid solution of the Navier-Stokes equations on triangular meshes*, AIAA J., 28 (1990), pp. 1415–1425.
- [2403] D. J. MAVRIPLIS AND L. MARTINELLI, *Multigrid solution of compressible turbulent flow on unstructured meshes using a two equation model*, Int. J. Numer. Meth. Fluids, 18 (1994), pp. 887–914.
- [2404] D. J. MAVRIPLIS AND V. VENKATAKRISHNAN, *Agglomeration multigrid for two dimensional viscous flows*, Comput. Fluids, 24 (1995), pp. 553–570.
- [2405] ———, *A 3D agglomeration multigrid solver for the Reynolds averaged Navier Stokes equations on unstructured meshes*, Int. J. Numer. Methods Fluids, 23 (1996), pp. 527–544.
- [2406] O. A. MCBRYAN, *New architectures: performance highlights and new algorithms*, Parallel Comput., 7 (1988), pp. 477–499.
- [2407] ———, *Performance of the Shallow Water Equations on the CM 200 and CM 5 parallel supercomputers*, in Proceedings of the Fifth ECMWF Workshop on the Use of Parallel Processors in Meteorology. Parallel Supercomputing in Atmospheric Science, G. R. Hoffman and T. Kauranne, eds., Singapore, 1993, World Scientific, pp. 345–353.
- [2408] O. A. MCBRYAN, P. O. FREDERICKSON, J. LINDEN, A. SCHULLER, K. SOLCHENBACH, K. STUBEN, C. A. THOLE, AND U. TROTENBERG, *Multigrid methods on parallel computers a survey of recent developments*, Impact Comput. Sci. Eng., 3 (1991), pp. 1–75.
- [2409] O. A. MCBRYAN AND E. F. VELDE, *The multigrid method on parallel processors*, in Multigrid Methods II, W. Hackbusch and U. Trottenberg, eds., Lecture Notes in Mathematics, Berlin, 1986, Springer-Verlag, pp. 232–260.
- [2410] D. R. McCARTHY, *Embedded mesh multigrid treatment of two-dimensional transonic flows*, Appl. Math. Comput., 13 (1983), pp. 399–418.
- [2411] D. R. McCARTHY AND W. R. JONES, *Adaptive domain decomposition and parallel CFD*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North-Holland), Amsterdam, 1995, pp. 31–40.
- [2412] D. R. McCARTHY AND T. A. REYHNER, *A multigrid code for the three-dimensional transonic potential flow about inlets*, AIAA J., 20 (1982), pp. 45–50.
- [2413] S. F. MCCORMICK, *Mesh refinement methods for integral equations*, in Numerical Treatment of Integral Equations, J. Albrecht and L. Collatz, eds., Birkhäuser-Verlag, Basel, 1980, pp. 183–190.
- [2414] ———, *A mesh refinement method for $Ax = \lambda Bx$* , Math. Comp., 36 (1981), pp. 485–498.
- [2415] ———, *An algebraic interpretation of multigrid methods*, SIAM J. Numer. Anal., 19 (1982), pp. 548–560.
- [2416] ———, *Multigrid methods for variation problems: The V-cycle*, in Math. Comput., Simulation XXV, North-Holland, Amsterdam, 1983, pp. 63–65.
- [2417] ———, *Fast adaptive composite grid (FAC) methods: Theory for the variational case*, in Defect Correction Methods: Theory and Applications, K. Böhmer and H. J. Stetter, eds., Computing Suppl. 5, Springer-Verlag, Vienna, 1984, pp. 115–121.
- [2418] ———, *Multigrid methods for variational problems: further results*, SIAM J. Numer. Anal., 21 (1984), pp. 255–263.
- [2419] ———, *Multigrid methods for variational problems: general theory for the V-cycle*, SIAM J. Numer. Anal., 22 (1985), pp. 634–643.
- [2420] ———, *A variational theory for multi-level adaptive techniques (MLAT)*, in Multigrid Methods for Integral and Differential Equations, D. Paddon and H. Holstein, eds., The Institute for Integral and Differential Equations, Clarendon Press, Oxford, 1985, pp. 225–230.
- [2421] ———, *The fast adaptive composite (FAC) method for elliptic equations*, Math. Comp., 46 (1986), pp. 439–456.
- [2422] ———, *Second copper mountain conference on multigrid methods*, Appl. Math. Comput., 19 (1986), pp. 1–372.

- [2423] ———, *Multigrid Methods*, vol. 3 of Frontiers in Applied Mathematics, SIAM Books, Philadelphia, 1987.
- [2424] ———, *Multigrid Methods: Theory, Applications, and Supercomputing*, vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988.
- [2425] ———, *Multigrid trends*, SIAM News, 21 (1988).
- [2426] ———, *Computation: breaking the matrix speed limit*, Nature Magazine (News and Views), 337 (1989).
- [2427] ———, *Multilevel Adaptive Methods for Partial Differential Equations*, vol. 6 of Frontiers in Applied Mathematics, SIAM Books, Philadelphia, 1989.
- [2428] ———, *Multilevel Projection Methods for Partial Differential Equations*, vol. 62 of CBMS–NSF, SIAM Books, Philadelphia, 1992.
- [2429] ———, *Multilevel adaptive methods for elliptic eigenproblems: two level convergence theory*, SIAM J. Numer. Anal., 31 (1994), pp. 1731–1745.
- [2430] S. F. MCCORMICK, S. M. MCKAY, AND J. W. THOMAS, *Computational complexity of the fast adaptive composite grid (fac) method*, Appl. Numer. Math., 6 (1990).
- [2431] S. F. MCCORMICK AND D. QUINLAN, *Asynchronous multilevel adaptive methods for solving partial differential equations on multiprocessors: performance results*, Parallel Comput., 12 (1989), pp. 145–156.
- [2432] ———, *Dynamic grid refinement for partial differential equations on parallel computers*, in Proceedings of the Seventh International Conference of Finite Element Methods in Flow Problems, 1989, pp. 1225–1230.
- [2433] ———, *Idealized analysis of asynchronous multilevel methods*, in Proceedings Symposium on Adaptive, Multilevel, and Hierarchical Computational Strategies, A. K. Noor, ed., vol. 157, ASME AMD, 1992, pp. 1–8.
- [2434] S. F. MCCORMICK AND U. RÜDE, *On local refinement higher order methods for elliptic partial differential equations*, Int. J. High Speed Comput., 2 (1990), pp. 311–334.
- [2435] ———, *A finite volume convergence theory for the fast adaptive composite grid method*, Appl. Numer. Math., 14 (1994), pp. 91–103.
- [2436] S. F. MCCORMICK AND J. W. RUGE, *Multigrid methods for variational problems*, SIAM J. Numer. Anal., 19 (1982), pp. 924–929.
- [2437] ———, *Unigrid for multigrid simulation*, Math. Comp., 41 (1983), pp. 43–62.
- [2438] ———, *Algebraic multigrid methods applied to problems in computational structural mechanics*, in State-of-the-Art Surveys on Computational Mechanics, ASME, New York, 1989, pp. 237–270.
- [2439] S. F. MCCORMICK AND J. W. THOMAS, *Multigrid methods applied to water wave problems*, in Proc. Third Internat. Conference Ship Hydrodynamics, Paris, 1981.
- [2440] ———, *The fast adaptive composite grid (FAC) method for elliptic equations*, Math. Comp., 46 (1986), pp. 439–456.
- [2441] S. F. MCCORMICK AND U. TROTTERBERG, *Multigrid methods*, Appl. Math. Comput., 13 (1983), pp. 213–474.
- [2442] S. F. MCCORMICK AND J. G. WADE, *Multigrid solution of a linearized, regularized least squares proble in electrical impedance tomography*, Inverse Probl., 9 (1993), pp. 697–713.
- [2443] S. M. MCKAY, *Adaptive Methods Applied to the Fast Adaptive Composite Grid Method*, PhD thesis, Colorado State University, Ft. Collins, 1990.
- [2444] S. M. MCKAY AND J. W. THOMAS, *Application of the self adaptive time dependent fast adaptive composite grid method*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 338–247.
- [2445] ———, *Resolution of moving fronts using the self-adaptive time-dependent fast adaptive composite grid method*, Comm. Appl. Num. Methods, 8 (1992), pp. 651–659.
- [2446] A. MCKENNEY, L. GREENGARD, AND A. MAYO, *A fast Poisson solver for complex geometries*, J. Comput. Phys., 118 (1995), pp. 348–355.
- [2447] R. I. McLACHLAN, *The boundary layer on a finite flat plate*, Phys. Fluids A, Fluid Dyn., 3 (1991), pp. 341–348.
- [2448] ———, *A steady separated viscous corner flow*, J. Fluid Mech., 231 (1991), pp. 1–34.
- [2449] M. R. MEHRABI AND R. A. BROWN, *Finite-element/Newton method for solution of nonlinear problems in transport processes using domain decomposition and nested dissection on MIMD parallel computers*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994,

- American Mathematical Society, pp. 413–425.
- [2450] ———, *Parallel implementation of finite-element/Newton method for solution of steady-state and transient nonlinear partial differential equations*, J. Sci. Comput., 10 (1995), pp. 93–137.
- [2451] P. MEHRING AND E. APOSPORIDIS, *Multi-level simulator for VLSI – an overview*, in PARLE: Parallel Architectures and Language Europe 1987, vol. 1, Berlin, 1987, Springer-Verlag, pp. 446–460.
- [2452] J. A. MEIJERINK, *Incomplete block LU-factorisation*, in IEEE Colloquium on Numerical Solution Techniques for Large Sparse Systems of Equations, IEEE, London, 1983.
- [2453] J. A. MEIJERINK AND H. A. VORST, *An iterative solution method for linear systems of which the coefficient matrix is a symmetric M-matrix*, Math. Comp., 31 (1977), pp. 148–162.
- [2454] A. J. MEIR, *On DGS relaxation: The Stokes problem*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 551–563.
- [2455] T. MEIS AND H. W. BRANCA, *Schnelle Lösung von Randwertaufgaben*, Z. Angew. Math. Mech., 62 (1982), pp. T263–T270.
- [2456] T. MEIS, H. LEHMANN, AND H. MICHAEL, *Application of the multigrid method to a nonlinear indefinite problem*, in Multigrid Methods, W. Hackbusch and U. Trottenberg, eds., vol. 960 of Lecture Notes in Mathematics, Berlin, 1982, Springer-Verlag, pp. 545–557.
- [2457] R. MEJIA, *Solution of differential-algebraic equations for renal acid-base balance*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 518–526.
- [2458] P. MEJZLÍK, *A bisection method to find all solutions of a system of nonlinear equations*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 277–282.
- [2459] N. D. MELSON AND E. LAVANTE, *Multigrid acceleration of the isenthalpic form of the compressible flow equations*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 431–448.
- [2460] N. D. MELSON, T. A. MANTEUFFEL, AND S. F. MCCORMICK, eds., *Sixth Copper Mountain Conference on Multigrid Methods*, vol. CP 3224, Hampton, VA, 1993, NASA.
- [2461] N. D. MELSON, T. A. MANTEUFFEL, S. F. MCCORMICK, AND C. C. DOUGLAS, eds., *Seventh Copper Mountain Conference on Multigrid Methods*, vol. CP 3339, Hampton, VA, 1996, NASA.
- [2462] N. D. MELSON AND M. D. SANETRIK, *Multigrid acceleration of time-accurate Navier–Stokes calculations*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 565–579.
- [2463] N. D. MELSON, M. S. SANETRIK, AND H. L. ATKINS, *Time-accurate Navier–Stokes calculations with multigrid acceleration*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 423–437.
- [2464] E. MÉMIN, F. HEITZ, AND F. CHAROT, *Efficient parallel multigrid relaxation algorithms for Markov random field-based low-level vision applications*, in Proceedings 1994 IEEE Computer Society Conference on Computer Vision and Pattern Recognition, Los Alamitos, CA, 1994, IEEE Computer Society Press, pp. 644–648.
- [2465] E. MEMIN AND P. PEREZ, *Multiresolution markov random field and multigrid algorithm for discontinuity preserving estimation of the optical flow*, Proc. SPIE - Int. Soc. Opt. Eng., 2568 (1995), pp. 30–41.
- [2466] B. MERCI, J. STEELANT, AND E. DICK, *Application of multigrid in two-equation turbulence modelling*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 171–178.
- [2467] M. L. MERRIAM, *Formal analysis of multigrid techniques applied to Poisson's equation in three dimensions*, AIAA, 81-1028 (1981).
- [2468] R. MERTENS, H. D. GERSEM, R. BELMANS, K. HAMEYER, D. LAHAYE, S. VANDEWALLE, AND D. ROOSE, *An algebraic multigrid method for solving very large electromagnetic systems*, IEEE Trans. Magnetics, 34 (1998), pp. 3327–3330.
- [2469] R. MERZ, K. JOERG, J. F. MAYER, AND H. STETTER, *Computation of three-dimensional viscous transonic turbine stage flow including TIP clearance effects*, in Proceedings of

- the International Gas Turbine and Aeroengine Congress and Exposition, vol. 95-GT-76, New York, 1995, American Society of Mechanical Engineers, p. 8.
- [2470] G. A. MEURANT, *Domain decomposition methods for partial differential equations on parallel computers*, Int. J. Supercomputer Appl., 2 (1988), pp. 5–12.
- [2471] ———, *Domain decomposition versus block preconditioning*, in First International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. Péliaux, eds., Philadelphia, 1988, SIAM, pp. 231–249.
- [2472] ———, *Domain decomposition methods for partial differential equations on parallel computers*, in Vector and Parallel Computing: issues in applied research and development, Ellis Horwood Ltd. (John Wiley & Sons), Chichester, 1989, pp. 241–253.
- [2473] ———, *Incomplete domain decomposition preconditioners for nonsymmetric problems*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Péliaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 219–225.
- [2474] ———, *Numerical experiments with domain decomposition method for parabolic problems on parallel computers*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Péliaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 394–408.
- [2475] ———, *Computer Solution of Large Linear Systems*, vol. 28 of Studies in Mathematics and Its Applications, North-Holland, Amsterdam, 1999.
- [2476] ———, *Numerical experiments with algebraic multilevel preconditioners*, Elect. Trans. Numer. Anal., 12 (2001), pp. 1–65.
- [2477] G. H. MEYER, *Hele–Shaw flow with a cusping free boundary*, J. Comput. Phys., 44 (1981), pp. 262–276.
- [2478] R. MEYER SPASCHE AND B. FORNBERG, *Discretization errors at free boundaries of the Grad–Schluter Shafrazi equation*, Numer. Math., 59 (1991), pp. 683–710.
- [2479] J. MICHALAKES, T. CANFIELD, R. NANJUNDIAH, S. HAMMOND, AND G. GRELL, *Parallel implementation, validation, and performance of cm5*, in Proceedings of the Sixth ECMWF Workshop on the Use of Parallel Processors in Meteorology, Reading, UK, Nov. 21–25, 1994, Singapore, 1995, World Scientific, pp. 266–276.
- [2480] S. MICHELETTI, A. QUARTERONI, AND R. SACCO, *Nonlinear block iterative solution of semiconductor device equations by a domain decomposition method*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 525–531.
- [2481] P. MICHELISE, *Parallel multigrid using PVM*, Supercomputer, 10 (1994), pp. 10–23.
- [2482] S. G. MICHLIN, *On the Schwarz algorithm*, Dokl. Akad. Nauk USSR, 77 (1951), pp. 569–571.
- [2483] H. MIERENDORFF, *Ein Konzept zur Nutzung eng gekoppelter Mehrrechnersysteme*, in Mitteilungen–Gesellschaft für Informatik e. V., Parallel–Algorithmen und Rechnerstrukturen, vol. 2, 1984, pp. 116–123.
- [2484] ———, *Transportleistung und Grösse paralleler Systeme bei speziellen Mehrgitteralgorithmen*, in Rechnerarchitekturen für die numerische Simulation auf der Basis superschneller Lösungsverfahren I, U. Trottenberg and P. Wypior, eds., GMD–Studien Nr. 88, Gesellschaft für Mathematik und Datenverarbeitung, St. Augustin, 1984, pp. 41–54.
- [2485] ———, *Parallelization of multigrid methods with local refinement for a class on nonshared memory systems*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 449–465.
- [2486] H. MIERENDORFF AND U. TROTENBERG, *Performance evaluation for SUPRENUM systems*, in Evaluating Supercomputers: Strategies for Exploiting, Evaluating, and Benchmarking Computers with Advanced Architectures, Chapman and Hall, 1990, pp. 95–114.
- [2487] S. MIJALKOVIC, *An adaptive multigrid algorithm for simulation of diffusion processes in semiconductor device fabrication*, Electrossoft, 1 (1991), pp. 277–290.
- [2488] S. MIJALKOVIC, *Evaluation of multigrid as a solver for stress analysis problems in semiconductor process simulation*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer–Verlag, pp. 179–185.
- [2489] S. MIJALKOVIC, D. PANTIC, Z. PRIJIC, AND S. MITROVIC, *MUSIC a multigrid simulator for IC fabrication processes*, COMPEL, Int. J. Comput. Math. Electr. Electron. Eng., 10 (1991), pp. 599–609.
- [2490] S. MIJALKOVIC, D. PANTIĆ, AND N. STOJADINOVIC, *On efficiency of multigrid methods in two-dimensional impurity redistribution simulation*, in Simulation of Semiconductor Devices and Processes, vol. 3, Technoprint, Bologna, 1989, pp. 463–474.

- [2491] K. MIKI AND T. TAKAGI, *A domain decomposing and overlapping method for the generation of three-dimensional boundary fitted coordinate systems*, J. Comput. Phys., 53 (1984), pp. 319–330.
- [2492] V. MIKULINSKY, *Multigrid methods for free boundary problems*, master's thesis, The Weizmann Institute of Science, Rehovet, Israel, 1987.
- [2493] ———, *Multigrid treatment of thin domains*, SIAM J. Sci. Stat. Comput., 12 (1991), pp. 940–949.
- [2494] K. MILLER, *Numerical analogs to the Schwarz alternating procedure*, Numer. Math., 7 (1965), pp. 91–103.
- [2495] ———, *Moving finite elements I*, SIAM J. Numer. Anal., 18 (1981), pp. 1033–1057.
- [2496] ———, *Moving finite elements. I*, SIAM J. Numer. Anal., 18 (1981), pp. 1019–1032.
- [2497] W. MING, *The multigrid method for TRUNC plate element*, J. Comput. Math., 11 (1993), pp. 178–187.
- [2498] W. L. MIRANKER AND V. Y. PAN, *Methods of aggregation*, Lin. Alg. Appl., 29 (1980), pp. 231–257.
- [2499] I. D. MISHEV, *Preconditioning cell-centered finite difference equations on grids with local refinement*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 283–288.
- [2500] R. E. MITCHELL, A. F. SAROFIM, AND L. A. CLOMBURG, *Experimental and numerical investigation of confined laminar diffusion flames*, Combust. and Flame, 37 (1980), pp. 227–244.
- [2501] W. F. MITCHELL, *Unified Multilevel Adaptive Finite Element Methods for Elliptic Problems*, PhD thesis, Univ. of Illinois at Urbana–Champaign, Urbana, Illinois, 1988.
- [2502] ———, *Optimal multilevel iterative methods for adaptive grids*, SIAM J. Sci. Stat. Comput., 13 (1992), pp. 146–167.
- [2503] ———, *MGGHAT: elliptic PDE software with adaptive refinement, multigrid and high order finite elements*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 439–448.
- [2504] ———, *A parallel multigrid method using the full domain partition*, Elect. Trans. Numer. Anal., 6 (1997), pp. 224–233.
- [2505] H. D. MITTELMANN, *A fast solver for nonlinear eigenvalue problems*, in Iterative Solution of Nonlinear Systems of Equations, R. Ansorge, T. Meis, and W. Törnig, eds., vol. 953 of Lecture Notes in Mathematics, Berlin, 1982, Springer–Verlag, pp. 46–67.
- [2506] ———, *Multi-grid methods for simple bifurcation problems*, in Multigrid Methods, W. Hackbusch and U. Trottenberg, eds., vol. 960 of Lecture Notes in Mathematics, Berlin, 1982, Springer–Verlag, pp. 558–575.
- [2507] H. D. MITTELMANN AND H. WEBER, *Multi-grid solution of bifurcation problems*, in Preliminary Proc. Internat. Multigrid Conference, Fort Collins, CO, 1983, Institute for Computational Studies at Colorado State University.
- [2508] H. MOES, *The air gap between tape and drum in a video recorder*, J. Magn. Magn. Mater., 95 (1991), pp. 1–13.
- [2509] H. K. MOFFAT AND K. F. JENSEN, *Complex flow phenomena in MOCVD reactors. I. Horizontal reactors*, J. Crystal Growth, 77 (1986), pp. 108–119.
- [2510] ———, *Three-dimensional flow effects in silicon CVD in horizontal reactors*, J. Electrochemical Soc., 135 (1988), pp. 459–471.
- [2511] M. MOHR AND U. RÜDE, *Multilevel techniques for the solution of the inverse problem of electrocardiography*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer–Verlag, pp. 186–192.
- [2512] D. MOISSIS, *Simulation of Viscous Fingering During Miscible Displacements in Nonuniform Porous Media*, PhD thesis, Rice University, Houston, TX, 1988.
- [2513] D. MOISSIS, C. A. MILLER, AND M. F. WHEELER, *A parametric study of viscous fingering in miscible displacement by numerical simulation*, in Numerical Simulation in Oil Recovery, M. F. Wheeler, ed., Springer–Verlag, 1988, pp. 228–249.
- [2514] W. J. A. MOL, *Numerical solution of the Navier–Stokes equations by means of a multigrid method and Newton–iteration*, in Proceedings of the Seventh International Conference on Numerical Methods in Fluid Dynamics, W. C. Reynolds and R. W. MacCormack, eds., vol. 141 of Lecture Notes in Physics, Berlin, 1981, Springer–Verlag, pp. 285–291.
- [2515] J. MOLENAAR, *A two-grid analysis of the combination of mixed finite elements and Vanka-type relaxation*, in Multigrid Methods III, W. Hackbusch and U. Trottenberg, eds.,

- vol. 98 of International Series of Numerical Mathematics, Basel, 1991, Birkhäuser, pp. 313–324.
- [2516] ———, *Adaptive multigrid applied to a bipolar transistor problem*, Appl. Numer. Math., 17 (1995), pp. 61–83.
- [2517] ———, *Multigrid for semiconductor device simulation: cell-centered or vertex-centered multigrid?*, Math. Eng. Industry, 5 (1995), pp. 1–22.
- [2518] ———, *Multigrid methods for fully implicit oil reservoir simulation*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 581–590.
- [2519] J. MOLENAAR AND P. W. HEMKER, *A multigrid approach for the solution of the 2d semiconductor equations*, Impact Comput. Sci. Eng., 2 (1990), pp. 219–243.
- [2520] P. MØLLER-NIELSEN AND J. STAUNTRUP, *Problem heap: A paradigm for multiprocessor algorithms*, Parallel Comput., 4 (1986), pp. 63–74.
- [2521] J. J. MONAGHAN AND J. C. LATTANZIO, *A simulation of the collapse and fragmentation of cooling molecular clouds*, Astrophys. J., 375 (1991), pp. 177–189.
- [2522] M. MONGA MADE AND B. POLMAN, *Efficient planewise-like preconditioners for solving 3D problems*, Numer. Lin. Alg. Appl., 6 (1999), pp. 379–406.
- [2523] P. MONK AND S. ZHANG, *Multigrid computation of vector potentials*, J. Comput. Appl. Math., 62 (1995), pp. 301–320.
- [2524] R. S. MONTERO, M. PRIETO, I. M. LLORENT, AND F. TIRADO, *Robust multigrid algorithms for 3D elliptic equations on structured grids*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer–Verlag, pp. 193–199.
- [2525] B. MOON, G. PATNAIK, R. BENNETT, D. E. FYFE, A. SUSSMAN, C. C. DOUGLAS, J. H. SALTZ, , AND K. KAILASANTH, *Runtime support and dynamic load balancing strategies for structured adaptive applications*, in Parallel Processing for Scientific Computing, SIAM Proceedings, Philadelphia, 1995, SIAM, pp. 575–580.
- [2526] S. MOORTHI AND R. W. HIGGINS, *Application of fast Fourier transforms to the direct solution of a class of two dimensional separable elliptic equations on the sphere*, Mon. Weather Rev., 121 (1993), pp. 290–296.
- [2527] R. MORANDI AND A. SESTINI, *Parallel computing multigrid methods*, Supercomputer, 38 (1990), pp. 39–47.
- [2528] E. MORANO, *Résolution des équations d'Euler par une méthode multigrille stationnaire*, PhD thesis, Université de Nice Sophia–Antipolis, 1992.
- [2529] E. MORANO AND A. DERVIEUX, *Looking for $O(N)$ Navier–Stokes solutions on non-structured meshes*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 449–463.
- [2530] ———, *Steady relaxation methods for unstructured multigrid Euler and Navier–Stokes solutions*, Int. J. Comput. Fluid Dyn., 5 (1995), pp. 137–167.
- [2531] E. MORANO, H. GUILLARD, A. DERVIEUX, M. P. LECLERCQ, AND B. STOUFFLET, *Faster relaxations for non-structured MG with Voronoi coarsening*, in Proceedings of the First Europ. Comput. Fluid Dynamics Conf. Brussels, Belgium, C. Hirsch, J. P'eriaux, and W. Kordulla, eds., vol. 1, Elsevier, 1992, ECCOMAS, pp. 69–74.
- [2532] E. MORANO, M. H. LALLEMAND, M. P. LECLERCQ, H. STEVE, B. STOUFFLET, AND A. DERVIEUX, *Local iterative upwind methods for steady compressible flows*, in GMD–Studien Nr. 189, Multigrid Methods: Special Topics and Applications II, 1991.
- [2533] E. MORANO, D. J. MAVRIPLIS, AND V. VENKATAKRISHNAN, *Coarsening strategies for unstructured multigrid techniques with application to anisotropic problems*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 591–606.
- [2534] J. E. MOREL, J. E. DENDY, M. HALL, AND S. WHITE, *A cell-centered lagrangian-mesh diffusion differencing scheme*, J. Comput. Phys., 103 (1992), pp. 286–299.
- [2535] J. E. MOREL, J. E. DENDY, AND T. A. WAREING, *Diffusion-accelerated solution of the two-dimensional s_n equations with bilinear-discontinuous differencing*, Nucl. Sci. Eng., 115 (1993), pp. 304–319.
- [2536] J. E. MOREL AND T. A. MANTEUFFEL, *An angular multigrid acceleration technique for the s_n equations with highly forward-peaked scattering*, Trans. ASME, 61 (1990), pp. 165–166.
- [2537] D. MORGESTERN, *Begründung des alternierenden Verfahrens durch Orthogonalprojektion*, ZAMM, 36 (1956), pp. 7–8.

- [2538] P. MORICE, *Transonic computations by a multidomain technique with potential and Euler solvers*, in Symposium Transsonicum III, J. Zienep and H. Oertel, eds., Berlin, 1989, Springer–Verlag.
- [2539] K. MORIYA AND T. NODERA, *The DEFLATED-GMRES(m,k) method with switching the restart frequency dynamically*, Numer. Lin. Alg. Appl., 7 (2000), pp. 569–584.
- [2540] L. S. D. MORLEY, *The triangular equilibrium problem in the solution of plate bending problems*, Aero. Quart., 19 (1968), pp. 149–169.
- [2541] R. MORRISON AND S. OTTO, *The scattered decomposition for finite elements*, J. Sci. Comput., 2 (1987), pp. 59–76.
- [2542] F. MOSCHENI, F. DUFAUX, AND H. NICOLAS, *Entropy criterion for optimal bit allocation between motion and prediction error information*, in Proc. SPIE - Int. Soc. Opt. Eng., vol. 2094, 1993, pp. 235–242.
- [2543] F. MOUKALLED AND S. ACHARYA, *Local adaptive grid procedure for incompressible flows with multigridding and equidistribution concepts*, Int. J. Numer. Meth. Fluids, 13 (1991), pp. 1085–1111.
- [2544] V. A. MOUSSEAU, D. A. KNOLL, AND W. J. RIDER, *A multigrid Newton–Krylov solver for non–linear systems*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer–Verlag, pp. 200–206.
- [2545] M. MRÓZ, *Domain decomposition methods with strip substructures*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 83–90.
- [2546] M. MU AND J. R. RICE, *Modeling with collaborating PDE solvers: Theory and practice*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 427–438.
- [2547] H. MÜHLENBEIN, *Modellierung von parallelen Mehrgitteralgorithmen und Rechnerstrukturen*, in Rechnerarchitekturen für die numerische Simulation auf der Basis superschneller Lösungsverfahren I, U. Trottenberg and P. Wypior, eds., GMD–Studien Nr. 88, Gesellschaft für Mathematik und Datenverarbeitung, St. Augustin, 1984, pp. 55–64.
- [2548] H. MÜHLENBEIN AND S. WARHAUT, *Concurrent multigrid methods in an object oriented environment—A case study*, in Rechnerarchitekturen für die numerische Simulation auf der Basis superschneller Lösungsverfahren II, U. Trottenberg and P. Wypior, eds., GMD–Studien Nr. 102, Gesellschaft für Mathematik und Datenverarbeitung, St. Augustin, 1985, pp. 151–156.
- [2549] W. A. MULDER, *Multigrid relaxation for the Euler equations*, J. Comput. Phys., 60 (1985), pp. 235–252.
- [2550] ———, *Multigrid relaxation for the Euler equations*, in Proceedings of the Ninth International Conference on Numerical Methods in Fluid Dynamics, Soubbaramayer and J. P. Boujot, eds., vol. 218 of Lecture Notes in Physics, Springer–Verlag, Berlin, 1985, pp. 417–421.
- [2551] ———, *Computation of the quasi-steady gas flow in a spiral galaxy by means of a multigrid method*, Astron. Astrophys., 156 (1986), pp. 354–380.
- [2552] ———, *Analysis of a multigrid method for the Euler equations of gas dynamics in two dimensions*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 467–489.
- [2553] ———, *A high-resolution euler solver*, AIAA, 89-1949 (1989).
- [2554] ———, *Multigrid, alignment, and Euler's equations*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 348–364.
- [2555] ———, *Multigrid, alignment, and Euler's equations*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 3, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 25–40.
- [2556] ———, *A new multigrid approach to convection problems*, J. Comput. Phys., 83 (1989), pp. 303–323.
- [2557] ———, *A new multigrid approach to convection problems*, in Proceedings of the Eleventh International Conference on Numerical Methods in Fluid Dynamics, vol. 323 of Lecture Notes in Physics, Springer–Verlag, Berlin, 1989, pp. 429–433.
- [2558] ———, *Multigrid for the one-dimensional inviscid Burgers equation*, SIAM J. Sci. Stat. Comput., 11 (1990), pp. 33–50.

- [2559] ———, *A note on the use of symmetric line Gauss–Seidel for the steady upwind differenced Euler equations*, SIAM J. Sci. Stat. Comput., 11 (1990), pp. 389–397.
- [2560] ———, *Efficient computation of the pre-asymptotic behaviour of unstable two-phase flow problems*, in Computational Fluid Dynamics '92, Elsevier Science Publishers B.V., Amsterdam, 1992, pp. 549–556.
- [2561] ———, *A high resolution Euler solver based on multigrid, semi coarsening, and defect correction*, J. Comput. Phys., 100 (1992), pp. 91–104.
- [2562] W. A. MULDER AND R. H. J. GMELIG MEYLING, *Numerical simulation of two-phase flow using locally refined grids in three space dimensions*, SPE Advanced Technology Series, 1 (1993), pp. 36–41.
- [2563] W. A. MULDER AND B. LEER, *Experiments with implicit upwind methods for the Euler equations*, J. Comput. Phys., 59 (1985), pp. 232–246.
- [2564] A. MULLER, *Domain decomposition of an atmospheric transport-chemistry model*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 776–783.
- [2565] R. MUÑOZ, *Theoretical analysis of some spectral multigrid methods*, Comput. Meth. Appl. Mech. Eng., 80 (1990), pp. 287–294.
- [2566] G. MURATOVA AND L. KRUKIER, *Multigrid method for the iterative solution of strongly nonselfadjoint problems with dissipative matrix*, in AMLI'96: Proceedings of the Conference on Algebraic Multilevel Iteration Methods with Applications, vol. 2, Nijmegen, The Netherlands, 1996, University of Nijmegen, pp. 169–178.
- [2567] F. MUSY, *Sur les méthodes multigrilles: formalisation algébrique et démonstration de convergence*, C.R. Acad. Sci. Paris, Ser. I, 295 (1982), pp. 471–474.
- [2568] ———, *Méthodes multigrille: démonstration de convergence incluant le V-cycle et le W-cycle; applications au lissage de Gauss–Seidel*, C.R. Acad. Sci. Paris, Ser. I, 298 (1984), pp. 369–372.
- [2569] ———, *Étude d'une classe de méthodes multigrilles pour les problèmes variational: théorie générale et estimations sur taux de convergence*, PhD thesis, Université Claude Bernard Lyon, 1985.
- [2570] A. E. MYNETT, P. WESSELING, A. SEGAL, AND C. G. M. KASSELS, *The ISNaS incompressible Navier–Stokes solver: invariant discretization*, Appl. Sci. Res., 48 (1991), pp. 175–191.
- [2571] E. C. NACUL AND G. S. LETT, *Under and over relaxation techniques for accelerating nonlinear domain decomposition methods*, in Proceedings of the SPE Symposium on Reservoir Simulation, Richardson, TX, 1993, Soc of Petroleum Engineers of AIME, pp. 105–112.
- [2572] M. S. NADAR, B. R. HUNT, AND P. J. SEMENTILLI, *Multigrid techniques and wavelet representations in image superresolution*, in Proceedings of SPIE - The International Society for Optical Engineering, vol. 2308, 1994, pp. 1244–1255.
- [2573] N. H. NAIK AND J. R. ROSENDALE, *Robust parallel multigrid using multiple semi-coarse grids*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 1, Denver, 1991, University of Colorado, pp. 17–26.
- [2574] ———, *The improved robustness of multigrid elliptic solvers based on multiple semicoarsened grids*, SIAM J. Numer. Anal., 30 (1993), pp. 215–229.
- [2575] W. NAJJAR AND J.-L. GAUDIOT, *A hierarchical data-driven model for multi-grid problem solving*, in High Performance Computer Systems, Elsevier Science Publishers B.V. (North-Holland), Amsterdam, 1988, pp. 67–78.
- [2576] A. NAKANO, R. K. KALIA, AND P. VASHISHTA, *Molecular dynamics simulation of aerogel silica on parallel computers*, in Materials Research Society Symposium Proceedings, vol. 293, Pittsburgh, PA, 1993, Materials Research Society, pp. 237–242.
- [2577] A. NAKANO, P. VASHISHTA, AND R. K. KALIA, *Parallel multiple-time-step molecular dynamics with three-body interaction*, Comput. Phys. Commun., 77 (1993), pp. 303–312.
- [2578] R. P. NANCE, R. G. WILMOTH, B. MOON, H. A. HASSAN, AND J. H. SALTZ, *Parallel Monte Carlo simulation of three-dimensional flow over a flat plate*, J. Thermophys. Heat Trans., 9 (1995), pp. 471–477.
- [2579] M. NAPOLITANO, *An incremental multigrid strategy for the fluid dynamic equations*, AIAA J., 24 (1986), pp. 2040–2042.
- [2580] ———, *A multigrid solver for the vorticity–velocity Navier–Stokes equations*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 3, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 41–48.
- [2581] ———, *Efficient solution of two-dimensional steady separated flows*, Comput. Fluids, 20 (1991), pp. 213–222.

- [2582] M. NAPOLITANO AND L. A. CATALANO, *Multigrid solver for the vorticity–velocity Navier–Stokes equations*, Int. J. Numer. Meth. Fluids, 13 (1991), pp. 49–59.
- [2583] F. NATAF, *Méthodes de Schur généralisées pour l'équation d'advection–diffusion (generalized Schur methods for the advection–diffusion equation)*, C. R. Acad. Sci. Paris, t. 314, Série I (1992), pp. 419–422.
- [2584] F. NATAF AND F. NIER, *Convergence rate of Schwarz-type methods for an arbitrary number of subdomains*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 171–177.
- [2585] F. NATAF AND F. ROGIER, *Factorization of the convection–diffusion operator and a (possibly) non overlapping Schwarz method*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 287–292.
- [2586] ———, *Outflow boundary conditions and domain decomposition method*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 289–293.
- [2587] ———, *A Schur type method based on outflow boundary condition*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North-Holland), Amsterdam, 1995, pp. 359–361.
- [2588] F. NATTERER, *The Mathematics of Computerized Tomography*, John Wiley & Sons, New York, 1986.
- [2589] A. NAVARRA, *An application of GMRES to indefinite linear problems in meteorology*, Comput. Phys. Commun., 53 (1989), pp. 321–327.
- [2590] I. M. NAVON AND Y. CAI, *Domain decomposition and parallel processing of a finite element model of the shallow water equations*, Comput. Meth. Appl. Mech. Engrg., 106 (1993), pp. 179–212.
- [2591] J. NEČAS, *Les Méthodes Directes en Théorie des Équations Élliptiques*, Academia, Prague, 1967.
- [2592] P. NEITTAANMÄKI AND M. KRÍZEK, *Conforming FE-method for obtaining the gradient of a solution to the Poisson equation*, in Efficient Solution of Elliptic Systems, W. Hackbusch, ed., vol. 10 of Notes on Numerical Fluid Mechanics, Braunschweig, 1984, Vieweg, pp. 74–86.
- [2593] S. V. NEPOMNYASCHIKH, *Domain decomposition and the Schwarz method in subspace for approximate solution of elliptic boundary problems*, PhD thesis, Computing Center of the Siberian Branch of the USSR Academy of Sciences, Novosibirsk, Russia, 1986.
- [2594] ———, *Application of domain decomposition to elliptic problems with discontinuous coefficients*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 242–251.
- [2595] ———, *Mesh theorems of traces, normalizations of function traces and their inversion*, Sov. J. Numer. Anal. Math. Modeling, 6 (1991), pp. 151–168.
- [2596] ———, *Method of splitting into subspaces for solving elliptic boundary value problems in complex form domains*, Sov. J. Numer. Anal. Math. Modeling, 6 (1991), pp. 1–20.
- [2597] ———, *Decomposition and fictitious domains methods for elliptic boundary value problems*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 62–72.
- [2598] ———, *Domain decomposition for elliptic problems with large condition numbers*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 75–85.
- [2599] ———, *Preconditioning operators on unstructured grids*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 607–621.
- [2600] ———, *Domain decomposition and multilevel techniques for preconditioning operators*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 193–203.
- [2601] H. NESTLE AND H. WOLNIK, *FAMA/FAMULAS: Programs for the fast calculation of two-dimensional distributions of magnetic and electric fields*, Nucl. Inst. Meth. Phys. Res.,

- A276 (1989), pp. 568–572.
- [2602] T. NEUNHOEFFER, *Multigrid methods for mixed finite element discretizations of variational inequalities*, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 257–268.
- [2603] C. NEUSIUS, J. OLSZEWSKI, AND D. SCHEERER, *Efficient distributed thinning algorithm*, Parallel Comput., 18 (1992), pp. 47–55.
- [2604] O. NEVANLINNA, *Convergence of Krylov methods for sums of two operators*, BIT, 36 (1996), pp. 775–785.
- [2605] M. NEYTCHEVA, O. AXELSSON, AND K. GEORGIEV, *An application of the AMLI method for solving convection-diffusion problems with potential velocity field*, in AMLI'96: Proceedings of the Conference on Algebraic Multilevel Iteration Methods with Applications, vol. 2, Nijmegen, The Netherlands, 1996, University of Nijmegen, pp. 197–210.
- [2606] M. K. NG AND R. J. PLEMMONS, *LMS-Newton adaptive filtering using FFT-based conjugate gradient iterations*, Elect. Trans. Numer. Anal., 4 (1996), pp. 14–36.
- [2607] R.-H. NI, *A multiple-grid scheme for solving the Euler equations*, AIAA, 81–1025 (1981).
- [2608] ———, *A multiple grid scheme for solving Euler equations*, AIAA J., 20 (1982), pp. 1565–1571.
- [2609] R. A. NICOLAIDES, *On multiple grid and related techniques for solving discrete elliptic systems*, J. Comput. Phys., 19 (1975), pp. 418–431.
- [2610] ———, *On the l^2 convergence of an algorithm for solving finite element equations*, Math. Comp., 31 (1977), pp. 892–906.
- [2611] ———, *On multi-grid convergence in the indefinite case*, Math. Comp., 32 (1978), pp. 1082–1086.
- [2612] ———, *On the observed rate of convergence of an iterative method applied to a model elliptic difference equation*, Math. Comp., 32 (1978), pp. 127–133.
- [2613] ———, *On finite element multigrid algorithms and their use*, in The Mathematics of Finite Elements and Application III, J. R. Whiteman, ed., London, 1979, Academic Press, pp. 459–466.
- [2614] ———, *On some theoretical and practical aspects of multigrid methods*, Math. Comp., 33 (1979), pp. 933–952.
- [2615] T. NIE AND J. FENG, *Domain decomposition finite volume method for three-dimensional inviscid flow calculations*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 501–504.
- [2616] J. NIEPLOCHA AND T. Z. MAI, *Performance improvement of asynchronous iterations by non uniform load distribution*, in Parallel Processing for Scientific Computing, SIAM Proceedings, Philadelphia, 1995, SIAM, pp. 508–509.
- [2617] A. NIESTEGGE, *Untersuchungen von Mehrgitterverfahren für die Stokes-Gleichungen*, PhD thesis, Institut für Angewandte Mathematik, Universität Düsseldorf, 1985.
- [2618] J. NIETRO, *Multigrid methods in network optimization: Overview and appraisal*, master's thesis, Naval Postgraduate School, Monterey, CA, 1994.
- [2619] B. NILO, *The transportation problem: A multi-level approach*, master's thesis, Weizmann Institute for Science, Rehovot, Isreal, 1986.
- [2620] H. NISHIDA AND N. SATOFUKA, *Numerical solution of unsteady incompressible Navier Stokes equations using high order method of lines*, Finite Elem. Anal. Des., 16 (1994), pp. P285–297.
- [2621] T. NKAOUA, *Coupling particles and finite differences for the nonlinear radiative transfer equations*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 527–530.
- [2622] D. M. NOSENCHUCK, S. E. KRIST, AND T. A. ZANG, *On multigrid methods for the Navier-Stokes computer*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 491–516.
- [2623] Y. NOTAY, *An efficient algebraic multilevel preconditioner robust with respect to anisotropies*, in AMLI'96: Proceedings of the Conference on Algebraic Multilevel Iteration Methods with Applications, vol. 2, Nijmegen, The Netherlands, 1996, University of Nijmegen, pp. 211–228.
- [2624] ———, *A robust algebraic multilevel preconditioner for nonsymmetric M-matrices*, Numer. Lin. Alg. Appl., 7 (2000), pp. 243–267.
- [2625] B. NOUR-OMID AND B. N. PARLETT, *Element preconditioning using splitting techniques*,

- SIAM J. Sci. Stat. Comput., 6 (1985), pp. 761–771.
- [2626] B. NOUR-OMID, B. N. PARLETT, AND A. RAEFSKY, *Comparison of Lanczos with conjugate gradient using element preconditioning*, in First International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. Périoux, eds., Philadelphia, 1988, SIAM, pp. 250–260.
- [2627] Z. P. NOWAK, *Use of the multigrid method for Laplacian problem in three dimensions*, in Multigrid Methods, W. Hackbusch and U. Trottenberg, eds., vol. 960 of Lecture Notes in Mathematics, Berlin, 1982, Springer-Verlag, pp. 576–598.
- [2628] ———, *Calculations of transonic flows around single and multi-element airfoils on a small computer*, in Advances in Multi-Grid Methods, D. Braess, W. Hackbusch, and U. Trottenberg, eds., vol. 11 of Notes on Numerical Fluid Mechanics, Braunschweig, 1984, Vieweg, pp. 84–101.
- [2629] Z. P. NOWAK AND P. WESSELING, *Multigrid acceleration of an iterative method with applications to transonic potential flow*, in Computing Methods in Applied Sciences and Engineering VI, R. Glowinski and J.-L. Lions, eds., Amsterdam, 1984, North-Holland, pp. 199–217.
- [2630] E. NÜRGAT AND M. BERZINS, *Multigrid methods for EHL problems*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 623–636.
- [2631] O. AXELSSON AND I. KAPORIN, *Error norm estimation and stopping criteria in preconditioned conjugate gradient iterations*, Numer. Lin. Alg. Appl., 8 (2001), pp. 265–286.
- [2632] J. M. OBERHUBER AND K. KETELSEN, *Parallelization of an OGCM on the CRAY T3D*, in Proceedings of the Sixth ECMWF Workshop on the Use of Parallel Processors in Meteorology, Reading, UK, Nov. 21–25, 1994, Singapore, 1995, World Scientific, pp. 494–504.
- [2633] M. OCHMANN AND F. WELLNER, *Calculation of the three dimensional sound radiation from a vibrating structure using a boundary element multigrid method*, Acustica, 73 (1991), pp. 177–190.
- [2634] J. T. ODEN, A. PATRA, AND Y. FENG, *Domain decomposition for adaptive hp finite element methods*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 295–301.
- [2635] J. T. ODEN, A. PATRA, AND Y. S. FENG, *An hp adaptive strategy*, in Adaptive, Multilevel and Hierarchical Computationa Strategies, AMD-Vol. 157, 1992, pp. 23–46.
- [2636] J. T. ODEN AND J. N. REDDY, *An Introduction to the Mathematical Theory of Finite Elements*, John Wiley & Sons, New York, 1982.
- [2637] J. T. ODEN, S. J. ROBERTSON, T. STROBOULIS, P. DEVLOO, L. W. SPRADLEY, AND H. V. McCONNAUGHERY, *Adaptive and moving mesh finite element methods for flow interaction problems*, in Sixth Intl. Symp. Finite Element methods in Flow Problems, M. O. Bristeau, R. G. adn A. Hauguel, and J. Périoux, eds., 1986, p. 339.
- [2638] C. W. OEHLRICH AND A. QUICK, *Performance evaluation of a communication system for transputer networks based on monitored event traces*, Comput. Archit. News, 19 (1991), pp. 202–211.
- [2639] K. OERTEL AND K. STÜBEN, *Multigrid with ILU-smoothing: systematic tests and improvements*, in Robust Multi-Grid Methods, vol. 23 of Notes on Numerical Fluid Mechanics, Braunschweig, 1989, Vieweg, pp. 188–199.
- [2640] L. A. OGANESIAN AND L. A. RUKHOVETS, *Variational difference methods for solving equations*, Akad. Nauk Arm. SSR, Erevan, 1979.
- [2641] S. OHRING, *Applications of the multigrid method to Poisson's equation in boundary-fitted coordinates*, J. Comput. Phys., 50 (1983), pp. 307–315.
- [2642] D. P. O'LEARY, *The block conjugate gradient algorithm and related methods*, J. Lin. Alg. Applic., 29 (1980), pp. 293–322.
- [2643] D. P. O'LEARY, *Ordering schemes for parallel processing of certain mesh problems*, SIAM J. Sci. Stat. Comp., 5 (1984), pp. 620–632.
- [2644] D. P. O'LEARY AND O. B. WIDLUND, *Capacitance matrix methods for the Helmholtz equation of general three-dimensional regions*, Math. Comp., 30 (1979), pp. 849–879.
- [2645] C. R. E. OLIVEIRA, C. C. PAIN, AND A. J. H. GODDARD, *Parallel domain decomposition methods for large scale finite element transport modelling*, in Proceedings of the International Conference, Mathematics and Computations, Reactor Physics, and Environmental Analyses 1995, vol. 12, La Grange Park, IL, 1995, American Nuclear Society,

- pp. 490–498.
- [2646] S. OLIVEIRA, *Multigrid and Krylov subspace methods for transport equations: Absorption case*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 637–648.
- [2647] ———, *A preconditioned multigrid subspace algorithm for computing eigenvalues and eigenvectors*, in AMLI'96: Proceedings of the Conference on Algebraic Multilevel Iteration Methods with Applications, vol. 2, Nijmegan, The Netherlands, 1996, University of Nijmegan, pp. 229–232.
- [2648] C. OLMSTED, D. COVEY, AND A. OTTO, *Boundary conditions and domain decomposition for a three dimensional finite difference time domain code on a Cray T3D*, in Parallel Processing for Scientific Computing, SIAM Proceedings, Philadelphia, 1995, SIAM, pp. 399–400.
- [2649] M. A. OLSHANSKII, *Iterative solver for the Oseen problem and numerical solution of incompressible Navier–Stokes equations*, Numer. Lin. Alg. Appl., 6 (1999), pp. 353–378.
- [2650] M. E. OMAN, *Fast multigrid techniques in total variation-based image reconstruction*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 649–659.
- [2651] M. E. G. ONG, *The 3D linear hierarchical basis preconditioner and its shared memory parallel implementation*, in Vector and Parallel Computing: issues in applied research and development, Ellis Horwood Ltd. (John Wiley & Sons), Chichester, 1989, pp. 273–283.
- [2652] C. W. OOSTERLEE, *Robust Multigrid Methods for the Steady and Unsteady Incompressible Navier–Stokes Equations in General Coordinates*, PhD thesis, Tech. Univ. Delft, Delft, 1993.
- [2653] ———, *The convergence of parallel multiblock multigrid methods*, Appl. Numer. Math., 19 (1995), pp. 115–128.
- [2654] ———, *A GMRES-based plane smoother in multigrid to solve 3D anisotropic fluid flow problems*, J. Comput. Phys., 130 (1997), pp. 41–53.
- [2655] C. W. OOSTERLEE, F. J. GASPAR, T. WASHIO, AND R. WIENANDS, *Fast multigrid solvers for higher order upwind discretizations of convection-dominated problems*, in Multigrid Methods V, vol. 3 of Lecture Notes in Computational Science and Engineering, Berlin, 1998, Springer, pp. 212–224.
- [2656] C. W. OOSTERLEE AND H. RITZDORF, *Flux difference splitting for three-dimensional steady incompressible Navier–Stokes equations in curvilinear coordinates*, Int. J. Numer. Meth. Fluids, 23 (1996), pp. 347–366.
- [2657] ———, *A robust parallel solver for 3D fluid flow problems using a high-level communications library*, in Parallel Computing: State-of-the Art Perspective (PARCO95), 1996, pp. 77–84.
- [2658] C. W. OOSTERLEE, H. RITZDORF, H. M. BLEECKE, AND B. EISFELD, *Benchmarking the FLOWER code on different parallel and vector machines*, in Parallel Computational Fluid Dynamics: Implementations and Results Using Parallel Computers, Amsterdam, 1996, Elsevier, pp. 281–288.
- [2659] C. W. OOSTERLEE, H. RITZDORF, A. SCHULLER, AND B. STECKEL, *Parallel multigrid results for Euler equations and grid partitioning into a large number of blocks*, in High Performance Computing and Networking. International Conference and Exhibition Proceedings, vol. 1: Applications, Berlin, Germany, 1994, Springer Verlag, pp. 145–150.
- [2660] C. W. OOSTERLEE, H. RITZDORF, A. SCHÜLLER, AND B. STECKEL, *Experience with a parallel multiblock multigrid solution technique for the Euler equations*, in Proceedings of the 10th GAMM Seminar Kiel ‘Fast solvers for flow problems’, vol. 49 of Notes on Numerical Mathematics, Braunschweig, 1995, Vieweg-Verlag, pp. 192–203.
- [2661] C. W. OOSTERLEE AND T. WASHIO, *On the use of multigrid as a preconditioner*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 441–448.
- [2662] C. W. OOSTERLEE AND P. WESSELING, *A multigrid method for an invariant formulation of the incompressible Navier–Stokes equations in general conditions*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 2, Denver, 1991, University of Colorado, pp. 77–102.
- [2663] ———, *A multigrid method for a discretization of the incompressible Navier–Stokes equations in general coordinates*, in Proceedings of the 9th GAMM Conference on Numerical

- Methods in Fluid Mechanics, J. B. Vos, A. Rizzi, and I. L. Ryhming, eds., vol. 35 of Notes on Num. Fluid Mech., Braunschweig, 1992, Vieweg, pp. 99–106.
- [2664] ———, *A multigrid method for an invariant formulation of the incompressible Navier-Stokes equations in general coordinates*, Comm. Appl. Num. Methods, 8 (1992), pp. 721–734.
 - [2665] ———, *A robust multigrid method for a discretization of the incompressible Navier-Stokes equations in general coordinates*, in Proceedings of the 1th European Fluid Dynamics Conference, C. Hirsch, J. Periaux, and W. Kordulla, eds., Amsterdam, 1992, Elsevier, pp. 101–108.
 - [2666] ———, *Multigrid schemes for time-dependent incompressible Navier-Stokes equations*, Impact Comput. Sci. Eng., 5 (1993), pp. 153–175.
 - [2667] ———, *A robust multigrid method for a discretization of the incompressible Navier-Stokes equations in general coordinates*, Impact Comput. Sci. Eng., 5 (1993), pp. 128–151.
 - [2668] ———, *Steady incompressible flow around objects in general coordinates with a multigrid solution method*, Numer. Meth. PDE, 10 (1994), pp. 295–308.
 - [2669] ———, *On the robustness of a multiple semi-coarsened grid method*, ZAMM, 75 (1995), pp. 251–257.
 - [2670] C. W. OOSTERLEE, P. WESSELING, A. SEGA, AND E. BRAKKEE, *Benchmark solutions for the incompressible Navier-Stokes equations in general co-ordinates on staggered grids*, Int. J. Numer. Meth. Fluids, 17 (1993), pp. 301–321.
 - [2671] C. W. OOSTERLEE, R. WIENANDS, T. WASHIO, AND F. J. GASPAR, *The acceleration of multigrid convergence by recombination techniques*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 34–43.
 - [2672] D. OPHIR, *Language for processes of numerical solutions to differential equations*, PhD thesis, Dept. of Applied Mathematics, Weizmann Institute of Science, Rehovot, Israel, 1978.
 - [2673] S. A. ORSZAG, *Spectral methods for problems in complex geometries*, J. Comput. Phys., 37 (1980), pp. 70–92.
 - [2674] S. OSHER AND R. SANDERS, *Numerical approximations to nonlinear conservation laws with locally varying time and space grids*, Math. Comp., 41 (1983), pp. 321–336.
 - [2675] T. OSHIMA, S. NAGATA, AND H. ISHIKAWA, *Acceleration of computational fluid dynamics by parallel asynchronous iterative algorithms (an evaluation of speed-up for point SOR method)*, Trans. Japan Soc. Mech. Eng., Part B, 61 (1995), pp. 1368–1373.
 - [2676] B. OSKAM AND J. M. J. FRAY, *General relaxation schemes in multigrid algorithms for higher order singularity methods*, J. Comput. Phys., 48 (1982), pp. 423–440.
 - [2677] ———, *General relaxation schemes in multigrid algorithms for higher order singularity methods*, in Multigrid Methods, H. Lomax, ed., NASA Conference Publication 2202, Ames Research Center, Moffett Field, CA, 1982, pp. 217–234.
 - [2678] P. OSWALD, *On function spaces related to finite element approximation theory*, Z. Anal. Anwendungen, 9 (1990), pp. 43–64.
 - [2679] ———, *On the degree of nonlinear spline approximation in Besov-Sobolev spaces*, J. Appr. Theory, (1990), pp. 131–157.
 - [2680] ———, *Hierarchical conforming finite element methods for the biharmonic equation*, SIAM J. Numer. Anal., 29 (1992), pp. 1610–1625.
 - [2681] ———, *On discrete norm estimates related to multilevel preconditioners in the finite element method*, in Constructive Theory of Functions, Proc. Int. Conf. Varna 1991, Sofia, 1992, Bulg. Acad. Sci., pp. 203–214.
 - [2682] ———, *On hierarchical basis multilevel method with nonconforming P1 elements*, Numer. Math., 62 (1992), pp. 189–212.
 - [2683] ———, *Multilevel Finite Element Approximation, Theory and Applications*, Teubner Skripten zur Numerik, Teubner Verlag, Stuttgart, 1994.
 - [2684] ———, *On the convergence rate of SOR: a worst case estimate*, Comput., 52 (1994), pp. 245–255.
 - [2685] ———, *Stable subspace splittings for Sobolev spaces and domain decomposition algorithms*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 87–98.
 - [2686] I. V. OTROSHCENKO AND R. P. FEDORENKO, *A relaxation method for solving a biharmonic difference equation*, U.S.S.R. Comput. Math. and Math. Phys., 23 (1983), pp. 57–63.
 - [2687] S. W. OTTO, *Parallel array classes and lightweight sharing mechanisms*, Sci. Prog., 2 (1993), pp. 203–216.

- [2688] S. OUALIBOUCHE AND N. E. MANSOURI, *Proximal domain decomposition algorithms and application to elliptic problems*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 91–98.
- [2689] A. OVERMAN AND J. R. ROSENDALE, *Mapping robust parallel multigrid algorithms to scalable memory architectures*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 635–647.
- [2690] A. PACUT AND M. BRUDKA, *Direct adaptive control with multi-grid networks*, in IEEE International Symposium on Industrial Electronics, vol. 1, Los Alamitos, 1996, IEEE, pp. 386–391.
- [2691] D. J. PADDON AND H. HOLSTEIN, *Multigrid Methods for Integral and Differential Equations*, vol. 3 of The Institute of Mathematics and its Applications Conference Series, Clarendon Press, Oxford, 1985.
- [2692] A. PADIY, *On a parallel multilevel solver for linear elasticity problems*, Numer. Lin. Alg. Appl., 6 (1999), pp. 171–188.
- [2693] J. PADOVAN, S. M. SANSGIRI, AND L. KRISHNA, *Multiply gauged solution initialization with steepest descent smoothing*, Int. J. Comput. Math., 50 (1994), pp. 165–182.
- [2694] O. PAETZOLD, A. SCHUELLER, AND H. SCHWICHTENBERGT, *Parallel applications and performance measurements on SUPRENUM*, Parallel Comput., 20 (1994), pp. 1571–1582.
- [2695] S. S. PAHL, *Schwarz type domain decomposition methods for spectral element discretizations*, master’s thesis, University of Witwatersrand, Johannesburg, South Africa, 1993.
- [2696] J. W. PAINTER, *Grid coupling methods for the multigrid solution of the neutron diffusion equation*, Trans. Amer. Nucl. Soc., 33 (1979), pp. 345–346.
- [2697] G. PALMA, *Renormalized loop expansion to compute finite size effects of the constraint effective potential*, Z. Phys. C, Part. Fields, 54 (1992), pp. 679–682.
- [2698] T. S. PAN AND A. E. YAGLE, *Numerical study of multigrid implementations of some iterative image reconstruction algorithms*, IEEE Trans. Med. Imaging, 10 (1991), pp. 572–588.
- [2699] V. PAN, *New effective methods for computations with structured matrices*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 3, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 77–116.
- [2700] V. PAN AND J. REIF, *On the bit-complexity of discrete solutions of PDEs: compact multigrid*, in Automata, Languages, and Programming, Springer–Verlag, New York, 1990, pp. 612–625.
- [2701] ———, *Generalized compact multigrid*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 2, Denver, 1991, University of Colorado, pp. 309–314.
- [2702] ———, *Compact multigrid*, SIAM J. Sci. Stat. Comput., 13 (1992), pp. 119–127.
- [2703] P. D. PANAGIOTOULOUS AND M. A. TZAFEROPoulos, *On the numerical treatment of non-convex energy problems: Multilevel decomposition methods for hemivariational inequalities*, Comput. Meth. Appl. Mech. Eng., 123 (1995), pp. 81–94.
- [2704] N. PANTELELIS, *The block adaptive multigrid method applied to the solution of the Euler equations*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 465–479.
- [2705] D. PANTIC AND S. M. N. STOJADINOVIC, *An efficient multiparticle diffusion simulation by an adaptive multigrid method*, Microelectron. J., 25 (1994), pp. 79–97.
- [2706] A. PAPAMANOLIS, *Multigrid methods in fluid dynamics*, master’s thesis, Dept. of Computer Science, University of Wales, Aberystwyth, 1984.
- [2707] A. L. PARDHANANI, W. F. SPOTZ, AND G. F. CAREY, *A stable multigrid strategy for convection-diffusion using high order compact discretization*, Elect. Trans. Numer. Anal., 6 (1997), pp. 211–223.
- [2708] H. PARK AND R. T. CHIN, *Optimal decomposition of convex morphological structuring elements for 4-connected parallel array processors*, IEEE Trans. Pattern Anal. Mach. Intell., 16 (1994), pp. 304–313.
- [2709] G. W. PARKER, *What is the capacitance of parallel plates?*, Comput. Phys., 5 (1991), pp. 534–540.
- [2710] I. D. PARSONS, *The implementation of an element level multigrid algorithm on the Alliant FX/8*, Computer Phys. Comm., 53 (1989), pp. 337–348.
- [2711] I. D. PARSONS AND J. F. HALL, *A finite element investigation of the elastostatic state near a three dimensional edge crack*, Eng. Fract. Mech., 33 (1989), pp. 45–63.

- [2712] ———, *The multigrid method in solid mechanics: Part I – algorithm description and behaviour*, Int. J. Numer. Meth. Engng., 29 (1990), pp. 719–738.
- [2713] ———, *The multigrid method in solid mechanics: Part II – practical applications*, Int. J. Numer. Meth. Engng., 29 (1990), pp. 739–753.
- [2714] S. V. PARTER, *A note on convergence of the multigrid V-cycle*, Appl. Math. Comput., 17 (1985), pp. 137–152.
- [2715] ———, *Estimates for multigrid methods based on red–black Gauss–Seidel smoothings*, Numer. Math., 52 (1988), pp. 701–723.
- [2716] ———, *Preconditioning boundary conditions: L₂ and H₁ theory*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Péliau, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 151–159.
- [2717] V. PARTHASARATHY AND Y. KALLINDERIS, *New multigrid approach for three dimensional unstructured, adaptive grids*, AIAA J., 32 (1994), pp. 956–963.
- [2718] ———, *Directional viscous multigrid using adaptive prismatic meshes*, AIAA J., 33 (1995), pp. 69–78.
- [2719] J. E. PASCIAK, *Domain decomposition preconditioners for elliptic problems in two and three dimensions*, in Numerical Algorithms for Modern Parallel Computer Architectures, IMA Volumes Math. Appl., Springer–Verlag, New York, 1988, pp. 163–172.
- [2720] ———, *Domain decomposition preconditioners for elliptic problems in two and three dimensions: first approach*, in First International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. Péliau, eds., Philadelphia, 1988, SIAM, pp. 62–72.
- [2721] ———, *Two domain decomposition techniques for Stokes problems*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Péliau, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 419–430.
- [2722] J. D. P. PASSCHIER AND W. J. GOEDHEER, *A two dimensional fluid model for an argon RF discharge*, J. Appl. Phys., 74 (1993), pp. 3744–3751.
- [2723] A. T. PATERA, *A spectral element method for fluid dynamics: Laminar flow in channel expansions*, J. Comput. Phys., 54 (1984), pp. 468–477.
- [2724] A. PATRA, *Newton–Krylov domain decomposition solvers for adaptive hp approximations of the steady incompressible Navier–Stokes equations with discontinuous pressure fields*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 449–456.
- [2725] O. PATZOLD, A. SCHULLER, AND H. SCHWICHTENBERG, *Parallel applications and performance measurements on SUPRENUM*, Parallel Comput., 20 (1994), pp. 1571–1582.
- [2726] L. F. PAVARINO, *Domain decomposition algorithms for the p-version finite element method for elliptic problems*, PhD thesis, New York University, New York, September 1992.
- [2727] ———, *Additive Schwarz methods for the p-version finite element method*, Numer. Math., 66 (1994), pp. 493–515.
- [2728] ———, *Schwarz methods with local refinement for the p-version finite element method*, Numer. Math., 69 (1994), pp. 185–211.
- [2729] ———, *Some Schwarz algorithms for the P-version finite element method*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 113–119.
- [2730] ———, *A wire basket based method for spectral elements in three dimensions*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 99–104.
- [2731] ———, *Preconditioners for mixed spectral element methods for elasticity and Stokes problems*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 197–204.
- [2732] ———, *Domain decomposition algorithms for first-order system least squares methods*, Elect. Trans. Numer. Anal., 8 (1998), pp. 1–14.
- [2733] L. F. PAVARINO AND M. RAME, *Numerical experiments with an overlapping additive Schwarz solver for 3-D parallel reservoir simulation*, Int. J. Supercomputer Appl. High Perform. Comput., 9 (1995), pp. 3–16.
- [2734] L. F. PAVARINO AND O. B. WIDLUND, *Iterative substructuring methods for spectral elements in three dimensions*, in The finite element method: fifty years of the Courant element, Marcel Dekker, New York, Basel, Hong Kong, 1994, pp. 345–355.

- [2735] ———, *Preconditioned conjugate gradient solvers for spectral elements in 3D*, in Solution Techniques for Large-Scale CFD Problems, John Wiley & Sons, New York, 1995, pp. 189–210.
- [2736] ———, *A polylogarithmic bound for an iterative substructuring method for spectral elements in three dimensions*, SIAM J. Numer. Anal., 33 (1996), pp. 1303–1335.
- [2737] K. PEINZE, *The SUPRENUM preprototype: status and experiences*, Parallel Comput., 7 (1988), pp. 297–313.
- [2738] A. P. PEIRCE, *Efficient multigrid solution of boundary element models of cracks and faults*, Int. J. Numer. Anal. Methods Geomech., 15 (1991), pp. 549–572.
- [2739] P. PEISKER, *A multilevel algorithm for the biharmonic problem*, Numer. Math., 46 (1985), pp. 623–634.
- [2740] ———, *A multigrid method for Reissner–Mindlin plates*, Numer. Math., 59 (1991), pp. 511–528.
- [2741] P. PEISKER AND D. BRAESS, *A conjugate gradient method and a multigrid method for Morley’s finite element approximation of the biharmonic equation*, Numer. Math., 50 (1987), pp. 567–586.
- [2742] R. B. PELZ AND A. JAMESON, *Transonic flow calculations using triangular finite elements*, AIAA J., 23 (1985), pp. 569–576.
- [2743] J. PERAIRE, J. PEIRO, AND K. MORGAN, *A 3D finite-element multigrid solver for the Euler equations*, AIAA, 92-0449 (1992).
- [2744] ———, *Finite element multigrid solution of Euler flows past installed aero-engines*, Comput. Mech., 11 (1993), pp. 433–451.
- [2745] ———, *Multigrid solution of the 3-D compressible Euler equations on unstructured tetrahedral grids*, J. Numer. Meth. Engrg., 36 (1993), pp. 1029–1044.
- [2746] J. PERAIRE, J. PEIRO, K. MORGAN, O. HASSAN, AND O. C. ZIENKIEWICZ, *Applications of supercomputers in aerodynamics*, Rev. Int. Metodos Numer. para Calc. Diseno Ing., 8 (1992), pp. 215–233.
- [2747] V. PEREYRA, *Deferred corrections software and its application to seismic ray tracing*, in Defect Correction Methods: Theory and Applications, K. Böhmer and H. J. Stetter, eds., Computing Suppl. 5, Springer-Verlag, Vienna, 1984, pp. 211–226.
- [2748] V. PEREYRA, W. PROSKUROWSKI, AND O. B. WIDLUND, *High order fast Laplace solvers for the Dirichlet problem on general regions*, Math. Comput., 31 (1977), pp. 1–16.
- [2749] E. PEREZ, J. PÉRIAUX, J. P. ROSENBLUM, B. STOUFFLET, A. DERVIEUX, AND M. H. LALLEMAND, *Adaptive full-multigrid finite element methods for solving the two-dimensional Euler equations*, in 10th Int. Conf. on Numer. Math. Fluid Dynamics, Beijing, vol. 254 of Lecture Notes in Physics, Springer Verlag, 1986.
- [2750] J. PÉRIAUX AND H. Q. CHEN, *Domain decomposition method using genetic algorithms*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 427–431.
- [2751] J. PÉRIAUX, B. MANTEL, AND H. Q. CHEN, *Intelligent interfaces of a Schwarz domain decomposition method via genetic algorithms for solving nonlinear PDEs: application to transonic flows simulations*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 575–582.
- [2752] M. PERIĆ, *Natural convection in trapezoidal cavities*, Numer. Heat Transf. A, Appl., 24 (1993), pp. 213–219.
- [2753] M. PERIĆ, R. KESSLER, AND G. SCHEUERER, *Comparison of finite-volume numerical methods with staggered and collocated grids*, Comput. Fluids, 16 (1988), pp. 389–403.
- [2754] M. PERIĆ, M. RÜGER, AND G. SCHEUERER, *A finite volume multigrid method for calculating turbulent flows*, in Proc. 7th Symp. on Turb. Shear Flows, Stanford, 1989, pp. 7.3.1–7.3.6.
- [2755] M. PERIĆ, M. SCHAFER, AND E. SCHRECK, *Numerical simulation of complex fluid flows on MIMD computers*, Parallel Computer Arch. Theory, Hardw., Softw., Appl., (1993), pp. 292–306.
- [2756] A. L. PERKINS, *Tailored domain decomposition*, Adv. Eng. Softw., 14 (1992), pp. 145–149.
- [2757] A. L. PERKINS AND G. RODRIGUE, *A domain decomposition method for solving a two-dimensional viscous Burgers’ equation*, Appl. Numer. Math., 6 (1990), pp. 329–340.
- [2758] S. PERKOVIC, E. M. BLOKHUIS, AND G. HAN, *Line and boundary tensions at the wetting transition: two fluid phases on a substrate*, J. Chem. Phys., 102 (1995), pp. 400–413.
- [2759] C. Y. PERNG AND R. L. STREET, *Coupled multigrid-domain-splitting technique for simulating incompressible flows in geometrically complex domains*, Int. J. Numer. Meth. Fluids, 13 (1991), pp. 269–286.

- [2760] M. PERNICE, *Domain decomposed preconditioners with Krylov methods as subdomain solvers*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 303–309.
- [2761] ———, *A hybrid multigrid method for the steady-state incompressible Navier–Stokes equations*, Elect. Trans. Numer. Anal., 10 (2000), pp. 74–91.
- [2762] I. PERSSON, K. SAMUELSSON, AND A. SZEPESSY, *On the convergence of multigrid methods for flow problems*, Elect. Trans. Numer. Anal., 8 (1998), pp. 46–87.
- [2763] I. PERUGIA AND V. SIMONCINI, Numer. Lin. Alg. Appl., 7 (2000), pp. 585–616.
- [2764] T. PETERSDORFF AND E. P. STEPHAN, *On the convergence of the multigrid method for a hypersingular integral equation of the first kind*, Numer. Math., 57 (1990), pp. 379–391.
- [2765] T. v. PETERSDORFF AND E. P. STEPHAN, *Multigrid solvers and preconditioners for first kind integral equations*, Numer. Meth. for PDE, 8 (1992), pp. 443–450.
- [2766] R. PEYRET, *The Chebyshev multidomain approach to stiff problems in fluid mechanics*, Comp. Meth. Appl. Mech. Engrg., 80 (1990), pp. 129–145.
- [2767] C. PFLAUM, *Anwendung von Mehrgitterverfahren auf dünnen Gittern*, PhD thesis, Technische Universität München, Munich, 1992.
- [2768] ———, *A multilevel algorithm for the solution of second order elliptic differential equations on sparse grids*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 661–672.
- [2769] ———, *Estimation of the condition number of additive preconditioners on tensor product grids*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer–Verlag, pp. 207–213.
- [2770] J. PHILBIN, J. EDLER, O. J. ANSHUS, C. C. DOUGLAS, AND K. LI, *Thread scheduling for cache locality*, in Proceedings of the Seventh ACM Conference on Architectural Support for Programming Languages and Operating Systems, Cambridge, MA, 1996, ACM, pp. 60–73.
- [2771] J. R. PHILLIPS, *Error and complexity analysis for a collocation-grid-projection plus precorrected-FFT algorithm for solving potential integral equations with Laplace or Helmholtz kernels*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 673–688.
- [2772] R. E. PHILLIPS, T. F. MILLER, AND F. W. SCHMIDT, *A multilevel–multigrid algorithm for axisymmetric recirculating flows*, in Proc. 5th Symp. on Turbulent Shear Flows, 1985, pp. 20.21–20.25.
- [2773] R. E. PHILLIPS AND F. W. SCHMIDT, *Multigrid techniques for the numerical solution of the diffusion equation*, Numer. Heat Transf., 7 (1984), pp. 251–268.
- [2774] ———, *Multigrid techniques for the solution of the passive scalar advection–diffusion equation*, Numer. Heat Transf., 8 (1985), pp. 25–43.
- [2775] ———, *Multilevel–multigrid technique for recirculationg flows*, Numer. Heat Transf., 11 (1985), pp. 417–442.
- [2776] T. N. PHILLIPS, *Numerical solution of a coupled pair of elliptic equations from solid state electronics*, J. Comput. Phys., 53 (1984), pp. 472–483.
- [2777] ———, *Pseudospectral domain decomposition techniques for the Navier–Stokes equations*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 531–540.
- [2778] T. N. PHILLIPS, T. A. ZANG, AND M. Y. HUSSAINI, *Spectral multigrid methods for Dirichlet problems*, in Multigrid Methods for Integral and Differential Equations, D. J. Paddon and H. Holstein, eds., vol. 3 of The Institute of Mathematics and its Applications Conference Series, Clarendon Press, Oxford, 1985, pp. 231–252.
- [2779] E. PIAULT, F. WILLIEN, AND F.-X. ROUX, *Parallel solvers for reservoir simulation on MIMD computers*, in Parallel Processing for Scientific Computing, SIAM Proceedings, Philadelphia, 1995, SIAM, pp. 478–483.
- [2780] G. PINI, *Domain decomposition and nested grids in a parallel environment*, Supercomputer, 9 (1992), pp. 22–28.
- [2781] C. K. PINK, I. J. ANDERSON, AND J. C. MASON, *A parallel domain decomposition method for spline approximation*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 457–464.
- [2782] J. PIQUET AND X. VASSEUR, *Comparisions between preconditioned BICGSTAB and a multi-*

- grid method for the resolution of the pressure equation in a Navier–Stokes solver*, in Multigrid Methods V, vol. 3 of Lecture Notes in Computational Science and Engineering, Berlin, 1998, Springer, pp. 225–242.
- [2783] J. PITKÄRANTA AND T. SAARINEN, *A multigrid version of a simple finite element method for the Stokes problem*, Math. Comp., 45 (1985), pp. 1–14.
- [2784] V. PIZZO, *Numerical modeling of solar magnetostatic structures bounded by current sheets, using multigrid methods*, in Physics of Magnetic Flux Ropes, C. T. Russel, ed., 1989.
- [2785] L. PLANK, E. STEIN, AND D. BISCHOFF, *Accuracy and adaptivity in the numerical analysis of thin-walled structures*, Comput. Meth. Appl. Mech. Eng., 82 (1990), pp. 223–256.
- [2786] A. PLAZA, L. FERRAGUT, AND R. MONTENEGRO, *Derefinement algorithms of nested meshes*, IFIP Trans. A, Comput. Sci. Technol., A12 (1992), pp. 409–415.
- [2787] A. PLOEG, E. F. F. BOTTA, AND F. W. WUBS, *Grid-independent convergence based on preconditioning techniques*, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 333–344.
- [2788] ———, *Nested grids ILU-decomposition (NGILU)*, J. Comput. Appl. Math., 66 (1996), pp. 515–526.
- [2789] H. POINCARÉ, *La méthode de Neumann et le problème de Dirichlet*, Acta Math, 20 (1896), pp. 59–?
- [2790] B. POIRIER, *Efficient preconditioning scheme for block partitioned matrices with structured sparsity*, Numer. Lin. Alg. Appl., 7 (2000), pp. 715–726.
- [2791] G. PÖLAU AND U. VAN RIENEN, *Multigrid algorithms for the tracking of electron beams*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer–Verlag, pp. 214–220.
- [2792] T. C. POLING, *Numerical experiments with multi-grid methods*, master’s thesis, Dept. of Numerical Mathematics, College of William and Mary, Williamsburg, VA, 1978.
- [2793] C. POLIZZOTTO, *A symmetric definite BEM formulation ofr the elastoplastic rate problem*, in Boundary IX, C. A. Brebbia, W. L. Wendland, and G. Kuhn, eds., vol. 2, Springer–Verlag, Berlin, Heidelberg, New York, Tokyo, 1987, pp. 315–334.
- [2794] C. POMMERELL, M. ANNARATONE, AND W. FICHTNER, *A set of new mapping and coloring heuristics for distributed-memory parallel processors*, in Proceedings of Copper Mountain Conference on Iterative Methods, vol. 414, 1990, pp. 1–27.
- [2795] C. POPA, *On smoothing properties of SOR relaxation for algebraic multigrid method*, Studii si Cerc. Mat. Ed. Academiei Române, 5 (1989), pp. 399–406.
- [2796] A. POTHEIN, *An analysis of spectral graph partitioning via quadratic assignment problems*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 105–110.
- [2797] R. POZO AND K. REMINGTON, *Fast three dimensional elliptic solvers on distributed network clusters*, in Proceedings of ParCo93. Parallel Computing 93, Grenoble, France, September 7–10, 1993, Amsterdam, 1994, Elsevier, pp. 201–208.
- [2798] J. K. PRENTICE AND M. M. FIKANI, *A domain decomposition technique for computational solid dynamics*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 541–544.
- [2799] W. H. PRESS AND S. A. TEUKOLSKY, *Multigrid methods for boundary value problems I*, Comput. Phys., 5 (1991), pp. 514–519.
- [2800] ———, *Multigrid methods for boundary value problems II*, Comput. Phys., 5 (1991), pp. 626–629.
- [2801] Y. PRESSBERGER AND R. PERUCCHIO, *Hierarchical two-level multigrid solver*, Comput. Struct., 55 (1995), pp. 471–483.
- [2802] ———, *A hierarchical two level multigrid solver*, Comput. Struct., 55 (1995), pp. 471–483.
- [2803] ———, *A self adaptive FE system based on recursive spatial decomposition and multigrid analysis*, Int. J. Numer. Meth. Engng., 38 (1995), pp. 1399–1421.
- [2804] S. A. PREUSS, *Solving linear boundary value problems by approximation the coefficients*, Math. Comp., 27 (1973), pp. 551–561.
- [2805] G. J. PRINGLE, *Embedding a ‘Treecode’ on a MIMD parallel computer using a domain decomposition paradigm*, Future Gener. Comput. Syst., 11 (1995), pp. 183–192.
- [2806] W. PROSKUROWSKI, *CMMPAK – The capacitance matrix software package*, in Elliptic Problem Solvers II, G. Birkhoff and A. Schoenstadt, eds., Academic Press, New York, 1984, pp. 65–74.

- [2807] ———, *Remarks on spectral equivalence of certain discrete operators*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1989, pp. 103–113.
- [2808] W. PROSKUROWSKI AND S. SHA, *Performance of the Neumann-Dirichlet preconditioner for substructures with intersecting interfaces*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1990, SIAM, pp. 322–337.
- [2809] W. PROSKUROWSKI AND O. B. WIDLUND, *On the numerical solution of Helmholtz's equation by the capacitance matrix method*, Math. Comp., 30 (1976), pp. 433–468.
- [2810] ———, *On the numerical solution of Helmholtz equation by the capacitance matrix method*, Math. Comp., 30 (1979), pp. 433–468.
- [2811] ———, *A finite element – capacitance matrix method for the Neumann problem for Laplace's equation*, SIAM J. Sci. Stat. Comput., 1 (1980), pp. 410–425.
- [2812] J. S. PRZEMIENIECKI, *Matrix structural analysis of substructures*, Am. Inst. Aero. Astro. J., 1 (1963), pp. 138–147.
- [2813] ———, *Theory of Matrix Structural Analysis*, McGraw–Hill, New York, 1968.
- [2814] P. PUISEUX, *Méthode multigrille pour la résolution de modèles mathématiques de l'industrie pétrolière*, PhD thesis, Université de Pau, July 1988.
- [2815] J. P. PULICANI, *A spectral multidomain method for the solution of 1D–Helmholtz and Stokes-type equations*, Comput. Fluids, 16 (1988), pp. 207–215.
- [2816] A. QUARTERONI, *Domain decomposition algorithms for the Stokes equations*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 431–442.
- [2817] ———, *Domain decomposition methods for systems of conservation laws: spectral collocation approximations*, SIAM J. Sci. Stat. Comput., 11 (1990), pp. 1029–1052.
- [2818] ———, *Domain decomposition and parallel processing for the numerical solution of partial differential equations*, Surv. Math. Industry, 1 (1991), pp. 75–118.
- [2819] A. QUARTERONI, F. PASQUARELLI, AND A. VILLI, *Heterogeneous domain decomposition: principles, algorithms, applications*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 129–150.
- [2820] A. QUARTERONI, J. PÉRIAUX, Y. A. KUZNETSOV, AND O. B. WIDLUND, *Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition*, vol. 157 of Contemporary Mathematics, American Mathematical Society, Providence, Rhode Island, 1994.
- [2821] A. QUARTERONI AND G. SACCHI LANDRIANI, *Domain decomposition preconditioners for the spectral collocation method*, J. Sci. Comput., 3 (1988), pp. 45–76.
- [2822] ———, *Domain decomposition preconditioners for the spectral collocation method*, J. Sci. Comput., 3 (1989), pp. 45–75.
- [2823] A. QUARTERONI AND A. VALLI, *Theory and application of Steklov–Poincaré operators for boundary-value problems*, in Applied and Industrial Mathematics, R. Spigler, ed., The Netherlands, 1989, pp. 179–203.
- [2824] ———, *Domain decomposition for a generalized Stokes problem*, in Third ECMI Proceedings, J. M. et al., ed., Dordrecht, Boston, London, 1990, Kluwer Academic Publishers, pp. 59–74.
- [2825] ———, *Theory and application of Steklov–Poincaré operators for boundary-value problems*, in Proc. of the Symp. on Applied and Industrial Mathematics, R. Spigler, ed., Dordrecht, Boston, London, 1991, Kluwer Academic Publishers, pp. 179–203.
- [2826] ———, *Theory and application of Steklov–Poincaré operators for boundary-value problems: the heterogeneous operator case*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 58–81.
- [2827] ———, *Numerical Approximation of Partial Differential Equations*, Springer–Verlag, Berlin, 1994.
- [2828] ———, *Domain Decomposition Methods for Partial Differential Equations*, Oxford University Press, Oxford, 1999.
- [2829] R. QUATEMBER AND W. L. WENDLAND, *Domain decomposition methods for three-dimensional thermoelastic problems on parallel computers*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 784–791.
- [2830] W. QUECK, *FEMGPL – A software package for solving elliptic boundary value problems on personal computers*, in Iterative Methods in Linear Algebra, R. Beauwens and

- P. de Groen, eds., North-Holland, 1992, pp. 627–633. Proc. of the IMACS Symposium, Brussels.
- [2831] ———, *The finite-element-multigrid-package FEMGP – A software tool for solving boundary value problems on personal computers*, in GAMM–Seminar on Multigrid–Methods, Gosen, Germany, September 21–25, 1992, S. Hengst, ed., Berlin, 1992, IAAS, pp. 39–48. Report No. 5.
- [2832] J. J. QUIRK, *An Adaptive Grid Algorithm for Computational Shock Hydrodynamics*, PhD thesis, Cranfield Institute of Technology, January 1991.
- [2833] J. E. P. R. LAZAROV AND P. S. VASSILEVSKI, *Iterative solution of a coupled mixed and standard galerkin discretization method for elliptic problems*, Numer. Lin. Alg. Appl., 8 (2001), pp. 13–31.
- [2834] R. RADESPIEL, C. C. ROSSOW, AND R. C. SWANSON, *An efficient cell-vertex multigrid scheme for the three dimensional Navier–Stokes equations*, AIAA, 89-1953 (1989).
- [2835] ———, *An efficient cell-vertex multigrid scheme for the three dimensional Navier–Stokes equations*, AIAA J., 28 (1990), pp. 1464–1472.
- [2836] R. RADESPIEL AND R. C. SWANSON, *An investigation of cell centered and cell vertex multigrid schemes for the Navier–Stokes equations*, AIAA, 89-0548 (1989).
- [2837] ———, *Multigrid schemes for viscous hypersonic flows*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 481–495.
- [2838] ———, *Progress with multigrid schemes for hypersonic flow problems*, J. Comput. Phys., 116 (1995), pp. 103–122.
- [2839] M. M. RAI, *A relaxation approach to patched-grid calculations with Euler equations*, AIAA, 85-0295 (1985).
- [2840] P. RAJ, *Multi-grid method for transonic wing analysis and design*, J. Aircr., 21 (1984), pp. 143–150.
- [2841] R. RAMAMURTI AND R. LÖHNER, *Simulation of complex incompressible flows using a finite element solver on MIMD machine*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North–Holland), Amsterdam, 1995, pp. 443–450.
- [2842] P. RAMANATHAN AND S. CHALASANI, *Parallel multigrid algorithms on CM–5*, in Computers and Digital Techniques, vol. 142 of IEEE Proceedings, New York, 1995, IEEE, pp. 177–184.
- [2843] J. D. RAMSHAW, *Conservative rezoning algorithms for generalized two-dimensional meshes*, J. Comput. Phys., 59 (1985), pp. 193–199.
- [2844] K. RAMSTÖCK, A. HUBERT, AND D. BERKOV, *Techniques for the computation of embedded micromagnetic structures*, IEEE Trans. Magn., 32 (1996), pp. 4228–4230.
- [2845] R. RANKIN, J. P. DEVILLIERS, AND J. C. SWANSON, *Parallel magnetohydrodynamics on Myrias MIMD computers*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North–Holland), Amsterdam, 1995, pp. 117–124.
- [2846] R. RANNACHER, *Parallel solution methods for the Navier–Stokes equations*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North–Holland), Amsterdam, 1995, pp. 61–70.
- [2847] R. RANNACHER AND G. ZHOU, *Analysis of a domain-splitting method for nonstationary convection-diffusion problems*, E. W. J. Numer. Math., 2 (1994), pp. 151–172.
- [2848] ———, *Mesh adaptation via a predictor–corrector–strategy in the streamline diffusion method for nonstationary hyperbolic systems*, in Adaptive Methods – Algorithms, Theory and Applications, vol. 46 of Notes on Numerical Fluid Mechanics, Braunschweig, 1994, Vieweg, pp. 236–250.
- [2849] A. R. M. RAO, K. LOGANATHAN, AND N. V. RAMAN, *Multi frontal based approach for concurrent finite element analysis*, Comput. Struct., 52 (1994), pp. 841–846.
- [2850] I. RASPO, J. OUAZZANI, AND R. PEYRET, *A direct Chebyshev multidomain method for flow computation with application to rotating systems*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 533–538.
- [2851] P.-A. RAVIART AND J.-M. THOMAS, *A mixed finite element method for second order elliptic problems*, in Mathematical Aspects of the Finite Element Method, A. Dold and B. Eckmann, eds., vol. 606 of Lecture Notes in Mathematics, Springer–Verlag, Heidelberg, 1977, pp. 292–315.
- [2852] D. RAYNER, *Multigrid flow solutions in complex two-dimensional geometries*, Int. J. Numer. Meth. Fluids, 13 (1991), pp. 507–518.
- [2853] R. BECKER AND M. BRAACK, *Multigrid techniques for finite elements on locally refined*

- meshes*, Numer. Lin. Alg. Appl., 7 (2000), pp. 363–379.
- [2854] F. REALE, M. BARBERA, AND S. SCIORTINO, *A parallel 2-D hydrodynamic FORTRAN code for astrophysical applications on a Meiko computing surface*, Future Gen. Comput. Sys., 9 (1993), pp. 19–24.
- [2855] H. REGLER AND U. RÜDE, *Layout optimization with algebraic multigrid methods*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 497–511.
- [2856] M. REICHELT, *Optimal convolution SOR acceleration of waveform relaxation with application to semiconductor device simulation*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 513–526.
- [2857] J. K. REID AND J. A. SCOTT, *Reversing the row order for the row-by-row frontal method*, Numer. Lin. Alg. Appl., 8 (2001), pp. 1–6.
- [2858] A. REIDER, *Multilevel methods based on wavelet decompositions*, E. W. J. Numer. Math., 2 (1994), pp. 313–330.
- [2859] A. REIDER, R. O. WELLS, AND X. ZHOU, *Wavelet approach to robust multilevel solvers for anisotropic elliptic problems*, Applied and Computational Harmonic Analysis, 1 (1994), pp. 355–367.
- [2860] H. J. REINHARDT, *On a principal of direct defect correction based on a posteriori error estimates*, in Defect Correction Methods: Theory and Applications, K. Böhmer and H. J. Stetter, eds., Computing Suppl. 5, Springer-Verlag, Vienna, 1984, pp. 43–66.
- [2861] S. REITZINGER, *Pebbles: parallel and element based grey box linear equation solver*. See <http://www.sfb013.uni-linz.ac.at/reitz/pebbles.html>.
- [2862] ———, *Algebraic Multigrid Methods for Large Scale Finite Element Equations*, PhD thesis, Johannes Kepler Universität-Linz, Linz, Austria, 2001.
- [2863] A. J. RENKEMA, R. VERSTAPPEN, R. W. VRIES, AND P. J. ZANDBERGEN, *Some experiences with spectral multigrid*, in Research in Numerical Fluid Mechanics, P. Wesseling, ed., vol. 17 of Notes on Numerical Fluid Mechanics, Braunschweig, 1987, Vieweg, pp. 101–114.
- [2864] A. REUSKEN, *Analysis of a Damped Nonlinear Multilevel Method*, PhD thesis, University of Utrecht, The Netherlands, 1988.
- [2865] ———, *Convergence of the multigrid full approximation scheme for a class of elliptic mildly nonlinear boundary value problems*, Numer. Math., 52 (1988), pp. 251–277.
- [2866] ———, *Convergence of the multigrid full approximation scheme including the V-cycle*, Numer. Math., 53 (1988), pp. 663–686.
- [2867] ———, *Steplength optimization and linear multigrid methods*, Numer. Math., 58 (1991), pp. 819–838.
- [2868] ———, *On maximum norm convergence of multigrid methods for two-point boundary value problems*, SIAM J. Numer. Anal., 29 (1992), pp. 1569–1578.
- [2869] ———, *Multigrid with matrix dependent transfer operators for a singular perturbation problem*, Comput., 50 (1993), pp. 199–211.
- [2870] ———, *Multigrid with matrix-dependent transfer operators for convection-diffusion problems*, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 269–280.
- [2871] ———, *On maximum norm convergence of multigrid methods for elliptic boundary value problems*, SIAM J. Numer. Anal., 31 (1994), pp. 378–392.
- [2872] ———, *On a robust multigrid solver*, Computing, 56 (1996), pp. 303–322.
- [2873] ———, *Approximate cyclic reduction preconditioning*, in Multigrid Methods V, vol. 3 of Lecture Notes in Computational Science and Engineering, Berlin, 1998, Springer, pp. 243–259.
- [2874] C. REY AND F. LÉNÉ, *Reuse of Krylov spaces in the solution of large-scale nonlinear elasticity problems*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 465–471.
- [2875] T. RHODES AND S. ACHARYA, *Adaptive differencing scheme for flow and heat transfer problems*, Numer. Heat Transf. B, Fundam., 23 (1993), pp. 153–173.
- [2876] C. J. RIBBENS, *A priori grid adaption strategies for elliptic pde's*, in Computer Methods for Partial Differential Equations VI, R. Vichnevetsky and R. Stepleman, eds., IMACS, New Brunswick, NJ, 1987, pp. 102–107.
- [2877] ———, *On adaptive domain decomposition with moving subdomains*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia,

- 1992, SIAM, pp. 322–329.
- [2878] J. R. RICE, *Parallel methods for PDEs*, in Taxonomy of Parallel Algorithms, MIT press, Cambridge, 1987.
- [2879] J. R. RICE AND R. F. BOISVERT, *Solving Elliptic Problems Using ELLPACK*, vol. 2 of Springer Series in Comp. Math., Springer–Verlag, Berlin, 1985.
- [2880] D. A. RICHTER AND M. TUMMALA, *Iterative system identification using multigrid techniques*, Electron. Lett., 28 (1992), pp. 433–434.
- [2881] R. D. RICHTMYER AND K. W. MORTON, *Difference Methods for Initial-Value Problems*, Interscience Publisher, John Wiley & Sons, New York, 1967.
- [2882] A. RIEDER, R. O. WELLS, JR., AND X. ZHOU, *A wavelet approach to robust multilevel solvers for anisotropic elliptic problems*, Appl. Comput. Harmon. Anal., 1 (1994), pp. 355–367.
- [2883] A. RIEDER AND X. ZHOU, *On the robustness of the damped V cycle of the wavelet frequency decomposition multigrid method*, Comput., 53 (1994), pp. 155–171.
- [2884] H. RIEGER, U. PROJAHN, AND H. BEER, *Fast iterative solution of Poisson equation with Neumann boundary conditions in nonorthogonal curvilinear coordinate systems by a multiple grid method*, Numer. Heat Transf., 6 (1983), pp. 1–15.
- [2885] K. RIEMSLAGH AND E. DICK, *A multigrid method for steady Euler equations on unstructured adaptive grids*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 527–541.
- [2886] U. RIENEN AND T. WEILAND, *Impedance calculation with URMEL-I using multigrid methods*, IEEE Trans. Magnetics, 26 (1990), pp. 743–746.
- [2887] M. RIES, *Lösung elliptischer Rand wertaufgaben mit approximativen und iterativen Reduktionsverfahren*, PhD thesis, Institut für Angewandte mathematik, Universität Bonn, 1981.
- [2888] M. RIES, U. TROTTERBERG, AND G. WINTER, *A note on MGR methods*, J. Lin. Alg. Applic., 49 (1983), pp. 1–26.
- [2889] H. RITZDORF, *Lokal verfeinerte Mehrgitter–Methoden für Gebiete mit einspringenden Ecken*, PhD thesis, Institut für Angewandte mathematik, Universität Bonn, 1984.
- [2890] H. RITZDORF, A. SCHÜLLER, A. B. STECKEL, AND K. STÜBEN, *liss – An environment for the parallel multigrid solution of partial differential equations on general 2D domains*, Parallel Comput., 20 (1994), pp. 1559–1570.
- [2891] H. RITZDORF AND K. STÜBEN, *Adaptive multigrid on distributed memory computers*, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 77–95.
- [2892] M. C. RIVARA, *Algorithms for refining triangular grids suitable for adaptive and multigrid techniques*, J. Numer. Meth. Engrg., 20 (1984), pp. 745–756.
- [2893] ———, *Fully adaptive multigrid finite-element software*, ACM Trans. Math. Soft., 10 (1984), pp. 242–264.
- [2894] D. RIXEN AND C. FARHAT, *Preconditioning the FETI method for problems with intra- and inter-subdomain coefficient jumps*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 472–479.
- [2895] A. RIZZI, P. ELIASSON, I. LINDBLAD, C. HIRSCH, C. LACOR, AND J. HAEUSER, *Engineering of multiblock/multigrid software for Navier–Stokes flows on structured meshes*, Comput. Fluids, 22 (1993), pp. 341–367.
- [2896] A. RIZZI AND L. E. ERIKSSON, *Unigrid projection method to solve the Euler equations for steady transonic flow*, in Proceedings of the Eighth International Conference on Numerical Methods in Fluid Dynamics, E. Krause, ed., vol. 170 of Lecture Notes in Physics, Berlin, 1982, Springer–Verlag, pp. 427–432.
- [2897] A. RIZZI AND H. VIVIAND, *Numerical Methods for the Computation of Inviscid Transonic Flows with Shock Waves*, vol. 3 of Notes on Numerical Fluid Dynamics, Vieweg, Braunschweig, 1981.
- [2898] P. J. ROACHE, *The SECOSuite of codes for site performance assessment*, in Proceedings of the Fourth Annual International Conference on High Level Radioactive Waste Management, vol. 2, New York, 1993, American Society of Civil Engineers, pp. 1586–1594.
- [2899] ———, *Elliptic Marching Methods and Domain Decomposition*, Symbolic and Computation Series, CRC Press, New York, 1995.
- [2900] P. J. ROACHE AND S. STEINBERG, *Application of a single-equation MG–FAS solver to elliptic grid generation equations (subgrid and supergrid coefficient generation)*, Appl. Math. Comput., 19 (1986), pp. 283–292.
- [2901] G. ROBINSON, *A simple parallel algebraic multigrid*, in Occam and the Transputer, IOS Press, 1991, pp. 62–75.

- [2902] G. RODRIGUE AND T. FERRETTA, *Coarse grid acceleration of some domain decomposition methods on multiprocessors*, in Aspects of Computation on Asynchronous Parallel Processors, Amsterdam, 1989, North Holland, pp. 255–260.
- [2903] G. RODRIGUE AND E. REITER, *A domain decomposition method for boundary layer problems*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 226–234.
- [2904] G. RODRIGUE AND J. SIMON, *A generalization of the numerical Schwarz algorithm*, in Computing Methods in Applied Sciences and Engineering VI, North-Holland, Amsterdam, 1984, pp. 273–283.
- [2905] P. L. ROE, *Approximate Riemann solvers, parameter vectors and difference schemes*, J. Comput. Phys., 43 (1981), pp. 357–372.
- [2906] Y.-H. ROECK, *Résolution sur Ordinateurs Multi-Processeurs de Problème d'Elasticité par Décomposition de Domaines*, PhD thesis, Université Paris IX Daupine, 1991.
- [2907] Y.-H. ROECK AND P. LETALLEC, *Analysis and test of a local domain decomposition*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 112–128.
- [2908] Y.-H. ROECK, P. LETALLEC, AND M. VIDRASCU, *A domain decomposed solver for nonlinear elasticity*, Comp. Meth. Appl. Mech. Engng., (1992), pp. 187–207.
- [2909] D. RON, *Development of Fast Numerical Solvers for Problems of Optimization and Statistical Mechanics*, PhD thesis, The Weizmann Institute of Science, Rehovot, Israel, 1989.
- [2910] H. RON-HO, *A multiple grid scheme for solving the Euler equations*, AIAA J., 20 (1982), pp. 1565–1571.
- [2911] C. RONCHI, R. IACONO, AND P. S. PAOLUCCI, *Finite difference approximation to the shallow water equations on a quasi uniform spherical grid*, in Proceedings of International Conference on High Performance Computing and Networking. HPCN '95 Milan, Italy, May 3–5, 1995, Berlin, 1995, Springer-Verlag, pp. 741–747.
- [2912] E. M. RØNQUIST, *A domain decomposition method for elliptic boundary value problems: applications to unsteady incompressible fluid flow*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 545–557.
- [2913] E. M. RØNQUIST, *A domain decomposition solver for three-dimensional steady free surface flows*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 792–801.
- [2914] E. M. RØNQUIST AND A. T. PATERA, *Spectral element multigrid. I. Formulation and numerical results*, J. Sci. Comput., 2(4) (1987), pp. 389–406.
- [2915] D. ROOSE AND S. VANDEWALLE, *Efficient parallel computation of periodic solutions of parabolic partial differential equations*, in Bifurcations and Chaos: Analysis, Algorithms, Applications, Berlin, 1991, Birkhäuser Verlag, pp. 307–317.
- [2916] M. E. ROSE, *Compact finite volume methods for the diffusion equation*, J. Sci. Comput., 4 (1989), pp. 261–290.
- [2917] I. G. ROSEN AND W. CHUNMING, *A multilevel technique for the approximate solution of operator Lyapunov and algebraic Riccati equations*, SIAM J. Numer. Anal., 32 (1995), pp. 514–541.
- [2918] J. R. ROSENDALE, *Rapid Solution of Finite Element Equations on Locally Refined Grids by Multi-Level Methods*, PhD thesis, University of Illinois, Urbana-Champaign, 1980.
- [2919] ———, *Algorithms and data structures for adaptive multigrid elliptic solvers*, Appl. Math. Comput., 13 (1983), pp. 453–470.
- [2920] M. ROSENFIELD AND D. KWAK, *Multigrid acceleration of a fractional step solver in generalized curvilinear coordinate systems*, AIAA J., 31 (1993), pp. 1792–1800.
- [2921] T. ROSSI, *Fictitious Domain Methods with Separable Preconditioners*, PhD thesis, University of Jyväskylä, Jyväskylä, Finland, 1995.
- [2922] T. ROSSI AND J. TOIVANEN, *Parallel fictitious domain decomposition for non-linear elliptic Neumann boundary value problem*, Numer. Lin. Alg. Appl., 6 (1999), pp. 51–60.
- [2923] C. C. ROSSOW, *Efficient computation of inviscid flow fields around complex configurations using a multi-block multigrid method*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 2, Denver, 1991, University of Colorado, pp. 139–149.
- [2924] ———, *Efficient computation of inviscid flow fields around complex configurations using a multiblock multigrid method*, Comm. Appl. Num. Methods, 8 (1992), pp. 735–747.
- [2925] ———, *Efficient cell vertex upwind scheme for the two dimensional Euler*, AIAA J., 32

- (1994), pp. 278–284.
- [2926] T. ROTTNER, L. LENHARDT, G. ALEFELD, AND K. SCHWEIZERHOF, *Nonlinear structural finite element analysis using the preconditioned Lanczos method on serial and parallel computers*, BIT, 37 (1997), pp. 759–769.
- [2927] F.-X. ROUX, *Tests on parallel machines of a domain decomposition method for a structural analysis problem*, in Proc. of 1988 International Conference on Supercomputing, New York, 1988, ACM Press, pp. 273–283.
- [2928] ———, *Méthode de Décomposition de Domaine à l'aide de Multiplicateur de Lagrange et Application à la résolution en Parallèle des équations de l'élasticité linéaire*, PhD thesis, Université Pierre et Marie Curie, Paris, 1989.
- [2929] ———, *Acceleration of the outer conjugate gradient by reorthogonalization for a domain decomposition method with Lagrange multiplier*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1990, SIAM, pp. 314–321.
- [2930] F.-X. ROUX, *Spectral analysis of the interface operators associated with the preconditioned saddle-point principle domain decomposition method*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 73–90.
- [2931] F.-X. ROUX AND C. FARHAT, *Parallel implementation of the two-level FETI method*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 480–487.
- [2932] F.-X. ROUX AND D. TROMEUR-DERVOUT, *Parallelization of a multigrid solver via a domain decomposition method*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 439–444.
- [2933] L. RUBART, *A multigrid algorithm for mixed finite element problems*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 1, Denver, 1991, University of Colorado, pp. 221–233.
- [2934] ———, *A multigrid algorithm for mixed finite-element problems*, Comm. Appl. Num. Methods, 8 (1992), pp. 661–669.
- [2935] S. G. RUBIN, *Incompressible Navier–Stokes and parabolized Navier–Stokes procedures and computational techniques*, in Computational Fluid Dynamics, Lecture Series 1982–04, von Karman Institute for Fluid Dynamics, Rhode–St.–Genèse, Belgium, 1982.
- [2936] P. A. RUBINI, H. A. BECKER, E. W. GRANDMAISON, A. POLLARD, A. SOBIESIAK, AND C. THURGOOD, *Multigrid acceleration of three dimensional, turbulent, variable density flows*, Numer. Heat Transf. B, Fundam., 22 (1992), pp. 163–177.
- [2937] M. F. RUBINSTEIN, *Combined analysis by substructures and recursion*, ASCE J. Structural Division, 93 (ST2) (1967), pp. 231–235.
- [2938] U. RÜDE, *On the accurate computation of singular solutions of Laplace's and Poisson's equation*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 517–540.
- [2939] ———, *Local corrections for eliminating the pollution effect of reentrant corners*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 365–382.
- [2940] ———, *Local corrections for eliminating the pollution effect of reentrant corners*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 3, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 53–75.
- [2941] ———, *The hierarchical basis extrapolation method*, SIAM J. Sci. Stat. Comput., 13 (1992), pp. 307–318.
- [2942] ———, *Fully adaptive multigrid methods*, SIAM J. Numer. Anal., 30 (1993), pp. 230–248.
- [2943] ———, *Mathematical and Computational Techniques for Multilevel Adaptive Methods*, vol. 13 of Frontiers in Applied Mathematics, SIAM, Philadelphia, 1993.
- [2944] ———, *Error estimators based on stable splittings*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 111–118.
- [2945] ———, *Multilevel, extrapolation, and sparse grid methods*, in Multigrid Methods IV, Pro-

- ceedings of the Fourth European Multigrid Conference, Amsterdam, July 6-9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 281–294.
- [2946] ———, *On the robustness and efficiency of the fully adaptive multigrid method*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 121–126.
- [2947] ———, *On the V-cycle of the fully adaptive multigrid method*, in Adaptive Methods – Algorithms, Theory and Applications, vol. 46 of Notes on Numerical Fluid Mechanics, Braunschweig, 1994, Vieweg, pp. 251–260.
- [2948] ———, *Stability of implicit extrapolation methods*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 99–107.
- [2949] U. RÜDE AND C. ZENGER, *On the treatment of singularities in the multigrid method*, in Multigrid Methods II, W. Hackbusch and U. Trottenberg, eds., Berlin, 1986, Springer-Verlag, pp. 261–271.
- [2950] M. RUEGER, *Berechnung zweidimensionaler turbulenter Stroemungen mit Mehrittermethoden*, PhD thesis, University of Erlangen, 1988.
- [2951] J. W. RUGE, *Multigrid Methods for Differential Eigenvalue and Variational Problems and Multigrid Simulation*, PhD thesis, Dept. of Mathematics, Colorado State University, Ft. Collins, CO, 1981.
- [2952] ———, *Algebraic multigrid (AMG) for geodetic survey problems*, in Preliminary Proc. Internat. Multigrid Conference, Fort Collins, CO, 1983, Institute for Computational Studies at Colorado State University.
- [2953] J. W. RUGE AND A. BRANDT, *A multigrid approach for elasticity problems on “thin” domains*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 541–554.
- [2954] J. W. RUGE AND K. STÜBEN, *Efficient solution of finite difference and finite element equations by algebraic multigrid (AMG)*, in Multigrid Methods for Integral and Differential Equations, D. J. Paddon and H. Holstein, eds., The Institute of Mathematics and its Applications Conference Series, Clarendon Press, Oxford, 1985, pp. 169–212.
- [2955] ———, *Algebraic multigrid (AMG)*, in Multigrid Methods, S. F. McCormick, ed., vol. 3 of Frontiers in Applied Mathematics, SIAM, Philadelphia, PA, 1987, pp. 73–130.
- [2956] H. RUI AND D. YANG, *Schwarz domain decomposition method with time stepping along characteristic for convection diffusion equations*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 309–315.
- [2957] S. RUMP, *Solution of linear and nonlinear algebraic problems with sharp, guaranteed results*, in Defect Correction Methods: Theory and Applications, K. Böhmer and H. J. Stetter, eds., Computing Suppl. 5, Springer-Verlag, Vienna, 1984, pp. 147–168.
- [2958] B. RUTTMANN AND K. SOLCHENBACH, *A multigrid solver for the in-cylinder turbulent flows in engines*, in Efficient Solution of Elliptic Systems, W. Hackbusch, ed., Braunschweig, 1984, Vieweg, pp. 87–108.
- [2959] ———, *Numerische Simulation der Strömungs- und Verbrennungsvorgänge im Motorzylinder*, in Rechnerarchitekturen für die numerische Simulation auf der Basis superschneller Lösungsverfahren II, U. Trottenberg and P. Wypior, eds., GMD-Studien Nr. 102, Gesellschaft für Mathematik und Datenverarbeitung, St. Augustin, 1985, pp. 259–272.
- [2960] Y. SAAD, *Further analysis of minimum residual iterations*, Numer. Lin. Alg. Appl., 7 (2000), pp. 67–93.
- [2961] Y. SAAD AND M. H. SCHULTZ, *GMRES: A generalized minimal residual algorithm for solving nonsymmetric linear systems*, SIAM J. Sci. Stat. Comput., 7 (1986), pp. 856–869.
- [2962] Y. SAAD, M. SOSONKINA, AND J. ZHANG, *Domain decomposition and multi-level type techniques for general sparse linear systems*, in Domain Decomposition Methods 10, J. Mandel, C. Farhat, and X.-C. Cai, eds., no. 218 in Contemporary Mathematics, Providence, RI, 1998, AMS, pp. 174–190.
- [2963] Y. SAAD AND J. ZHANG, *BILUM: block versions of multilevel elimination and multilevel ILU preconditioner for general sparse linear systems*, SIAM J. Sci. Comput., 20 (1999), pp. 2103–2121.
- [2964] ———, *Diagonal threshold techniques in robust multi-level ILU preconditioners for general sparse linear systems*, Numer. Lin. Alg. Appl., 6 (1999), pp. 257–280.

- [2965] P. SADAYAPPAN AND F. ECRAL, *Nearest-neighbor mappings of finite element graphs onto processor meshes*, IEEE Trans. Comput., 36, no. 12 (1987), pp. 1408–1420.
- [2966] P. SADAYAPPAN AND F. ECRAL, *Cluster-partitioning approaches to mapping parallel programs onto a hypercube*, in Proceedings of International Conference on Supercomputing, E. Houstis, T. S. Papatheodorou, and C. Polychronopoulos, eds., Athens, Greece, 1987, Springer-Verlag, pp. 476–497.
- [2967] F. SADEGHI AND K.-H. KIM, *Effects of a single bump or dent in time dependent thermal line EHD lubrication*, J. Tribol. Trans. ASME, 116 (1994), pp. 9–20.
- [2968] O. SAEVAREID, H. K. DAHLE, AND M. S. ESPEDAL, *Domain decomposition for reservoir flow problems*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1990, SIAM, pp. 481–491.
- [2969] V. V. SAJDUROV, *On the solution of eigenvalue problems of variational difference equations in a sequence of grids*, in Variational Difference Methods in Mathematical Physics, N. S. Bakhvalov and Y. A. Kuznetsov, eds., Moscow, 1984, AN SSSR, pp. 149–160.
- [2970] M. SALCUDEAN, P. NOWAK, AND Z. ABDULLAH, *Cold flow computational model of a recovery boiler*, J. Pulp Paper Sci., 19 (1993), pp. J186–J193.
- [2971] M. D. SANETRIK AND R. C. SWANSON, *A multiblock multigrid solution procedure for multi-element airfoils*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 558–565.
- [2972] N. L. SANKAR, *A multigrid strongly implicit procedure for 2-D transonic potential flow problems*, AIAA, 82–0931 (1982).
- [2973] ———, *A multigrid strongly implicit procedure for transonic potential flow problems*, AIAA J., 21 (1983).
- [2974] M. SARKIS, *Two-level Schwarz methods for nonconforming finite elements and discontinuous coefficients*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 543–565.
- [2975] ———, *Multilevel methods for p1 nonconforming finite elements and discontinuous coefficients in three dimensions*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 119–124.
- [2976] V. SASS, H. C. KUHLMANN, AND H. J. RATH, *Investigation of three-dimensional thermocapillary convection in a cubic container by a multi-grid method*, Int. J. Heat Mass Transf., 39 (1996), pp. 603–613.
- [2977] N. SATOFUKA, M. OBATA, AND T. SUZUKI, *Parallel computation of 2-D potential and Euler equations on transputer arrays*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North-Holland), Amsterdam, 1995, pp. 525–532.
- [2978] M. A. SAUNDERS, *Solution of sparse rectangular systems with LSQR and CRAIG*, BIT, 35 (1995), pp. 586–602.
- [2979] S. SAUTER AND G. WITTUM, *A multigrid method for the computation of eigenmodes of closed water basins*, Impact Comput. Sci. Eng., 4 (1992), pp. 124–152.
- [2980] M. SAXENA AND R. PERUCCHIO, *Parallel FEM algorithms based on recursive spatial decomposition. I. Automatic mesh generation*, Comput. Struct., 45 (1992), pp. 817–831.
- [2981] ———, *Parallel FEM algorithms based on recursive spatial decomposition. II. Automatic analysis via hierarchical substructuring*, Comput. Struct., 47 (1993), pp. 143–154.
- [2982] M. E. M. SAYED AND C. K. HSUUNG, *Comparison between two decomposition approaches for parallel computation of structural optimization*, Comput. Struct., 52 (1994), pp. 719–722.
- [2983] H. SBOSNY, *Parallel multigrid methods on composite meshes*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 401–408.
- [2984] H. SBOSNY AND K. WITSCH, *Parallel multigrid using domain decomposition*, in Notes on Numerical Fluid Mechanics, vol. 31, 1991, pp. 200–215.
- [2985] M. SCHAFER, *Numerical solution of the time dependent axisymmetric Boussinesq equations on processor arrays*, SIAM J. Sci. Stat. Comput., 13 (1992), pp. 1377–1393.
- [2986] S. SCHAFFER, *High order multi-grid methods to solve the Poisson equation*, in Multigrid Methods, H. Lomax, ed., NASA Conference Publication 2202, Ames Research Center, Moffett Field, CA, 1982, pp. 275–284.

- [2987] ———, *Higher order multi-grid methods*, Math. Comp., 43 (1984), pp. 89–115.
- [2988] U. SCHATTLER AND E. KRENZIEN, *Experiences on plotting the Deutschland Modell of DWD to parallel platforms and first results*, in Proceedings of the Sixth ECMWF Workshop on the Use of Parallel Processors in Meteorology, Reading, UK, Nov. 21-25, 1994, Singapore, 1995, World Scientific, pp. 223–239.
- [2989] A. H. SCHATZ, *An observation concerning Ritz-Galerkin methods with indefinite bilinear forms*, Math. Comp., 28 (1974), pp. 959–962.
- [2990] P. SCHIANO AND A. MATRONE, *Parallel CFD applications: experiences on scalable distributed multicompilers*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North-Holland), Amsterdam, 1995, pp. 3–12.
- [2991] F. SCHIEWECK, *A parallel multigrid algorithm for solving the Navier Stokes equations*, Impact Comput. Sci. Eng., 5 (1993), pp. 345–378.
- [2992] H. SCHIPPERS, *Multigrid techniques for the solution of Fredholm integral equations of the second kind*, in MCS 41, Colloquium on the Numerical Treatment of Integral Equations, H. J. J. T. Riele, ed., Dept. of Numerical Mathematics, Mathematical Centre, Amsterdam, 1979, pp. 29–49.
- [2993] ———, *Multiple grid methods for oscillating disk flow*, in Boundary and Interior Layers—Computational and Asymptotic Methods, J. J. H. Miller, ed., Boole Press, Dublin, 1980, pp. 410–414.
- [2994] ———, *Application of multigrid methods for integral equations to two problems from fluid dynamics*, J. Comput. Phys., 48 (1982), pp. 441–461.
- [2995] ———, *Application of multigrid methods for integral equations to two problems from fluid dynamics*, in Multigrid Methods, H. Lomax, ed., NASA Conference Publication 2202, Ames Research Center, Moffett Field, CA, 1982, pp. 193–216.
- [2996] ———, *On the regularity of the principal value of the double layer potential*, J. Engrg. Math., 16 (1982), pp. 59–76.
- [2997] ———, *Multiple Grid Methods for Equations of the Second Kind with Applications in Fluid Mechanics*, PhD thesis, Mathematisch Centrum, Amsterdam, 1983.
- [2998] H. SCHLICHTING, *Boundary-Layer Theory*, McGraw-Hill, New York, 1979.
- [2999] W. SCHMID, *Solution of the neutron diffusion equation using multigrid methods*, Z. Angew. Math. Mech., 75 (1995), pp. 709–710.
- [3000] W. SCHMIDT AND A. JAMESON, *Applications of multi-grid methods for transonic flow calculations*, in Multigrid Methods, W. Hackbusch and U. Trottenberg, eds., vol. 960 of Lecture Notes in Mathematics, Berlin, 1982, Springer-Verlag, pp. 599–613.
- [3001] R. SCHNEIDER, *Wavelets and frequency decomposition multilevel methods*, in Adaptive Methods – Algorithms, Theory and Applications, vol. 46 of Notes on Numerical Fluid Mechanics, Braunschweig, 1994, Vieweg, pp. 261–272.
- [3002] C. R. SCHNEIDESCH AND M. O. DEVILLE, *Chebyshev collocation method and multi domain decomposition for Navier Stokes equations in complex curved geometries*, J. Comput. Phys., 106 (1993), pp. 234–257.
- [3003] C. R. SCHNEIDESCH, M. O. DEVILLE, AND E. H. MUND, *Domain decomposition method coupling finite elements and preconditioned Chebyshev collocation to solve elliptic problems*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 293–298.
- [3004] J. SCHÖBERL, *NETGEN: An advancing front 2D/3D-mesh generator based on abstract rules*, Comput. Visual Sci., 1 (1997), pp. 41–52.
- [3005] W. SCHÖNAUER, W. SCHNEPF, AND K. RAITH, *Numerical engineering: experiences in designing PDE software with selfadaptive variable step size/variable order difference methods*, in Defect Correction Methods: Theory and Applications, K. Böhmer and H. J. Stetter, eds., Computing Suppl. 5, Springer-Verlag, Vienna, 1984, pp. 227–242.
- [3006] U. SCHRADER, *Convergence of asynchronous Jacobi-Newton iterations*, Numer. Lin. Alg. Appl., 6 (1999), pp. 157–165.
- [3007] E. SCHRECK AND M. PERIĆ, *Computation of fluid flow with a parallel multigrid solver*, Int. J. Numer. Meth. Fluids, 16 (1993), pp. 303–327.
- [3008] J. SCHRÖDER, U. TROTENBERG, AND K. WITSCH, *On fast Poisson solvers and applications*, in Numerical Treatment of Differential Equations, vol. 631 of Lecture Notes in Mathematics, Springer, Berlin, 1978, pp. 153–187.
- [3009] W. SCHRÖDER AND D. HÄNEL, *Multigrid solution of the Navier-Stokes equations for the flow in a rapidly rotating cylinder*, in Proceedings of the Ninth International Conference on Numerical Methods in Fluid Dynamics, Soubaramayer and J. P. Boujot, eds., vol. 218 of Lecture Notes in Physics, Berlin, 1985, Springer-Verlag.

- [3010] ———, *Applications of the multigrid method to the solution of parabolic differential equations*, in Notes on Numerical Fluid Dynamics, vol. 14, Vieweg, Braunschweig, 1986.
- [3011] ———, *A comparison of several MG-methods for the solution of the time-dependent Navier-Stokes equations*, in Multigrid Methods II, W. Hackbusch and U. Trottenberg, eds., Berlin, 1986, Springer-Verlag, pp. 272–284.
- [3012] ———, *An unfactored implicit scheme with multigrid acceleration for the solution of the Navier-Stokes equations*, Comput. Fluids, 15 (1987), pp. 313–336.
- [3013] ———, *A multigrid-relaxation scheme for the Navier-Stokes equations*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 555–577.
- [3014] A. SCHÜLLER, *Anwendung von Mehrgittermethoden auf das Problem einer ebenen, reibungsfreien und kompressiblen Unterschallströmung am Beispiel des Kreisprofils*, PhD thesis, Institut für Angewandte Mathematik, Universität Bonn, 1983.
- [3015] A. SCHULLER, C. W. OOSTERLEE, H. RITZDORF, H. SCHWICHTENBERG, B. STECKEL, AND J. WU, *Parallelization and adaptive grids for industrial aerodynamic multigrid codes*, in 5th European Multigrid Conference Special Topics and Applications, University of Stuttgart, Stuttgart, 1998, pp. 113–124.
- [3016] M. H. SCHULTZ, *L^2 error bounds for the Rayleigh-Ritz-Galerkin method*, SIAM J. Numer. Anal., 8 (1971), pp. 737–748.
- [3017] ———, *Spline Analysis*, Prentice-Hall, Englewood Cliffs, 1973.
- [3018] U. SCHUMANN AND H. VOLKERT, *Three-dimensional mass- and momentum-consistent Helmholtz-equation in terrain-following coordinates*, in Efficient Solution of Elliptic Systems, W. Hackbusch, ed., vol. 10 of Notes on Numerical Fluid Mechanics, Braunschweig, 1984, Vieweg, pp. 109–131.
- [3019] R. SCHWANE AND D. HÄNEL, *An implicit flux-vector splitting scheme for the computation of viscous hypersonic flow*, AIAA, 89-0274 (1989).
- [3020] U. SCHWARDMANN, *Parallelization of a multigrid solver on the KSR1*, Supercomputer, 10 (1993), pp. 4–12.
- [3021] ———, *Parallelization and data locality of a multigrid solver on the KSR1*, in High Performance Computing and Networking. International Conference and Exhibition Proceedings, vol. 2: Networking and Tools, Berlin, Germany, 1994, Springer Verlag, pp. 217–218.
- [3022] H. A. SCHWARZ, *Über einige Abbildungsaufgaben*, Ges. Math. Abh., 11 (1869), pp. 65–83.
- [3023] H. SCHWICHTENBERG, *Erweiterungsmöglichkeiten des Programmpaketes MG01 auf nicht-lineare Aufgaben*, PhD thesis, Institut für Angewandte Mathematik, Universität Bonn, 1985.
- [3024] J. A. SCOTT, *A new row ordering strategy for frontal solvers*, Numer. Lin. Alg. Appl., 6 (1999), pp. 189–211.
- [3025] L. R. SCOTT, *Elliptic preconditioners using fast summation techniques*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 311–323.
- [3026] L. R. SCOTT AND S. ZHANG, *Higher-dimensional nonnested multigrid methods*, Math. Comp., 58 (1992), pp. 457–466.
- [3027] ———, *A multigrid iterated penalty method for mixed elements*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 242–247.
- [3028] T. SCOTT, *Multigrid methods for oil reservoir simulation in three dimensions*, in Multigrid Methods for Integral and Differential Equations, D. J. Paddon and H. Holstein, eds., The Institute of Mathematics and its Applications Conference Series 3, Clarendon Press, Oxford, 1985, pp. 283–300.
- [3029] ———, *Multigrid methods for oil reservoir simulation in two and three dimensions*, J. Comput. Phys., 59 (1985), pp. 290–307.
- [3030] J. S. SCROGGS, *Parallel computation of a domain decomposition method*, in Proceedings of the Second SIAM Conference on Parallel Processing for Scientific Computing, Philadelphia, 1987, SIAM.
- [3031] ———, *The Solution of a Parabolic Partial Differential Equation via Domain Decomposition: The Synthesis of Asymptotic and Numerical Analysis*, PhD thesis, University of Illinois at Urbana-Champaign, 1988.
- [3032] ———, *An iterative method for systems of nonlinear hyperbolic equations*, Comput. Math. Appl., 21 (1989), pp. 137–144.
- [3033] ———, *A parallel iterative solution method for systems of nonlinear hyperbolic equations*, in Proceedings of the Fourth SIAM Conference on Parallel Processing for Scientific

- Computing, Philadelphia, 1989, SIAM, pp. 273–277.
- [3034] ———, *A parallel algorithm for nonlinear convection-diffusion equations*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Péraux, and O. B. Widlund, eds., SIAM, Philadelphia, 1990, pp. 373–384.
- [3035] ———, *A physically motivated domain decomposition for singularly perturbed equations*, SIAM J. Numer. Anal., 28 (1991), pp. 168–178.
- [3036] J. S. SCROGGS AND J. H. SALTZ, *Distributed computing and adaptive solution to nonlinear PDES*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Péraux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 409–417.
- [3037] J. S. SCROGGS AND D. C. SORENSEN, *An asymptotic induced numerical method for the convection-diffusion-reaction equation*, in Mathematics for Large Scale Computing, J. Diaz, ed., Marcel Dekker, New York, 1989, pp. 81–114.
- [3038] A. SEGAL, P. WESSELING, J. KAN, C. W. OOSTERLEE, AND C. G. M. KASSELS, *Invariant discretization of the incompressible Navier-Stokes equations in boundary fitted coordinates*, Int. J. Numer. Meth. Fluids, 15 (1992), pp. 411–426.
- [3039] A. SEIDEL, *A multigrid method for solution of the diffusion equation in VLSI process modeling*, IEEE Trans. Electron Devices, ED-30, 9 (1983), pp. 999–1004.
- [3040] W. L. SELLERS AND S. O. KJELGAARD, *The basic aerodynamics research tunnel – a facility dedicated to code validation*, AIAA, 88-1997 CP (1988).
- [3041] S. SERRA, *Multi iterative methods*, Comput. Math. Appl., 26 (1993), pp. 65–87.
- [3042] S. SERRA CAPIZZANO AND C. TABLINO POSSIO, *High-order finite difference schemes and Toeplitz based preconditioners for elliptic problems*, Elect. Trans. Numer. Anal., 11 (2000), pp. 55–84.
- [3043] J. L. SESTERHENN, B. MÜLLER, AND H. THOMANN, *Flux-vector splitting for compressible low Mach number flow*, Computers and Fluids, 22 (1993), pp. 441–451.
- [3044] ———, *Flux-vector splitting for compressible low Mach number flow*, in Nonlinear Hyperbolic Problems: Theoretical, Applied and Computational Aspects, A. Donato and F. Oliveri, eds., vol. 43 of NNFM, Braunschweig, 1993, Vieweg, pp. 528–535.
- [3045] ———, *A simple characteristic flux evaluation scheme for subsonic flow*, in Computational Fluid Dynamics'94, S. Wagner, J. Periaux, and E. H. Hirschel, eds., vol. 2, Chichester, 1994, ECCOMAS, John Wiley & Sons, pp. 57–61.
- [3046] J. N. SHADID AND R. S. TUMINARO, *Sparse iterative algorithm software for largescale MIMD machines: an initial discussion and implementation*, Concurrency, Pract. Exp., 4 (1992), pp. 481–497.
- [3047] V. V. SHAIDUROV, *Multigrid Methods for Finite Elements*, vol. 318 of Mathematics and Its Applications, Kluwer Academic Publishers, Dordrecht, Boston, London, 1995.
- [3048] V. V. SHAIDUROV AND G. TIMMERMAN, *Stable semi-iterative smoother for cascadic and multigrid algorithms*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 221–227.
- [3049] F. SHAKIB, T. J. R. HUGHES, AND Z. JOHAN, *Element-by-element algorithms for non-symmetric matrix problems arising in fluids*, in Solution of Super Large Problems in Computational Mechanics, J. H. Kane, A. D. Carlson, and D. L. Cox, eds., Plenum, New York, 1989, pp. 1–33.
- [3050] W. SHANGMENG AND L. XIAOMEI, *A class of stable difference schemes for linear elliptic PDE's and their asynchronous parallel computation*, Wuhan U. J. Nat. Sci., 1 (1996), pp. 553–556.
- [3051] J. P. SHAO, *The modified vertex space domain decomposition method for Neumann boundary value problems*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 325–336.
- [3052] J. P. SHAO AND L. KANG, *An asynchronous parallel mixed algorithm for linear and nonlinear equations*, Parallel Comput., 5 (1987), pp. 313–321.
- [3053] J. P. SHAO, L. KANG, Y. CHEN, AND D. J. EVANS, *The convergence rate of Schwarz alternating procedure – for unsymmetric problems*, Int. J. Comput. Math., 21 (1987), pp. 85–108.
- [3054] D. SHAOZONG AND Z. SHUQUAN, *A class of EBE time integration algorithms for transient finite element structural dynamical analysis*, Wuhan U. J. Nat. Sci., 1 (1996), pp. 495–501.
- [3055] Y. SHAPIRA, *Black box multigrid solver for definite and indefinite problems*, in AMLI'96: Pro-

- ceedings of the Conference on Algebraic Multilevel Iteration Methods with Applications, vol. 2, Nijmegen, The Netherlands, 1996, University of Nijmegen, pp. 235–250.
- [3056] ———, *Multigrid techniques for highly indefinite equations*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 689–705.
- [3057] ———, *Algebraic domain decomposition method for unstructured grids*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 205–214.
- [3058] Y. SHAPIRA, M. ISRAELI, AND A. SIDI, *An automatic multigrid method for the solution of sparse linear systems*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 567–582.
- [3059] G. J. SHAW AND S. SIVALOGANATHAN, *On the smoothing properties of the SIMPLE pressure-correction algorithm*, Int. J. Numer. Meth. Fluids, 8 (1988), pp. 441–461.
- [3060] ———, *The SIMPLE pressure-correction method as a nonlinear smoother*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 579–596.
- [3061] G. W. SHAW, *Multigrid Methods in Fluid Dynamics*, PhD thesis, University of Oxford, 1986.
- [3062] G. W. SHAW AND P. WESSELING, *Multigrid solution of the compressible Navier-Stokes equations on a vector computer*, in Proc. Tenth International Conference on Numerical Methods in Fluid Dynamics, F. G. Zhuang and Y. L. Zhu, eds., vol. 264 of Lecture Notes in Physics, Springer-Verlag, Berlin, 1986, pp. 566–571.
- [3063] C. SHENG, L. K. TAYLOR, AND D. L. WHITFIELD, *Multigrid algorithm for three dimensional incompressible high Reynolds number turbulent flows*, AIAA J., 33 (1995), pp. 2073–2079.
- [3064] Z. SHENG AND H. H. CI, *Multigrid multi level domain decomposition*, J. Comput. Math., 9 (1991), pp. 17–27.
- [3065] J. R. SHEWCHUK AND O. GHATTAS, *A compiler for parallel finite element methods with domain-decomposed unstructured meshes*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 445–450.
- [3066] Z. SHI AND Z. XIE, *Substructure preconditioners for nonconforming plate elements*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 109–115.
- [3067] A. S.-L. SHIEH, *Solution of coupled system of PDE by the transistorized multi-grid method*, in Proc. Conference on Numerical Simulation of VSLI devices, Boston, MA, 1984.
- [3068] ———, *On the solution of the advection-diffusion equation on a non-uniform mesh by a RMP-accelerated multigrid method*, in Advanced Computational Methods in Heat Transfer, Computational Mechanics Publications, 1990, pp. 275–281.
- [3069] Y. SHIFTAN, *Multi-grid methods for solving elliptic difference equations*, master's thesis, Dept. of Applied Mathematics, Weizmann Institute of Science Rehovot, Israel, 1972.
- [3070] T.-M. SHIH, C.-B. LIEM, AND T. LU, *Additive Schwarz methods and acceleration with variable weights*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 299–309.
- [3071] T.-M. SHIH, C.-B. LIEM, T. LU, AND A. ZHOU, *A multi-color splitting method and convergence analysis for local grid refinement*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 337–342.
- [3072] T. M. SHIH AND A. L. REN, *Primitive-variable formulations using nonstaggered grids*, Numer. Heat Transf., 7 (1984), pp. 413–428.
- [3073] T. M. SHIH, C. H. TAN, AND B. C. HWANG, *Effects of grid staggering on numerical schemes*, Int. J. Numer. Meth. Fluids, 9 (1989), pp. 413–428.
- [3074] O. SHISHKINA, *Optimality of the pseudodiagonal hierarchical preconditioner*, in AMLI'96: Proceedings of the Conference on Algebraic Multilevel Iteration Methods with Applications, vol. 2, Nijmegen, The Netherlands, 1996, University of Nijmegen, pp. 251–258.
- [3075] ———, *Three-colour parallel multilevel preconditioner*, Sys. Anal. Model. Sim., 24 (1996), pp. 255–261.

- [3076] A. SHMILOVICH AND D. A. CAUGHEY, *Application of the multi-grid method to calculations of transonic potential flow about wing-fuselage combinations*, J. Comput. Phys., 48 (1982), pp. 462–484.
- [3077] ———, *Application of the multi-grid method to calculations of transonic potential flow about wing-fuselage combinations*, in Multigrid Methods, H. Lomax, ed., NASA Conference Publication 2202, Ames Research Center, Moffett Field, CA, 1982, pp. 101–130.
- [3078] ———, *Calculation of transonic potential flow past wing-tail-fuselage combinations using multigrid techniques*, in Proceedings of the Ninth International Conference on Numerical Methods in Fluid Dynamics, Soubbaramayer and J. P. Boujot, eds., vol. 218 of Lecture Notes in Physics, Berlin, 1985, Springer-Verlag.
- [3079] V. SHULTZ AND G. WITTUM, *Multigrid optimization methods for stationary problems I: the Stokes-type case*, in Multigrid Methods V, vol. 3 of Lecture Notes in Computational Science and Engineering, Berlin, 1998, Springer, pp. 276–288.
- [3080] W. SHYY, *A study of finite difference approximations to steady-state, convection-dominated flow problems*, J. Comput. Phys., 57 (1985), pp. 415–438.
- [3081] W. SHYY, M. E. BRAATEN, AND D. L. BURRUS, *Study of three-dimensional gas-turbine combustor flows*, Int. J. Heat Mass Transf., 32 (1989), pp. 1155–1164.
- [3082] W. SHYY AND C.-S. SUN, *Development of a pressure-correction/staggered-grid based multigrid solver for incompressible recirculating flows*, Computer Fluids, 22 (1993), pp. 51–76.
- [3083] W. SHYY, C.-S. SUN, M. H. CHEN, AND K. C. CHANG, *Multigrid computation for turbulent recirculating flows in complex geometries*, Numer. Heat Transf. A, Appl., 23 (1993), pp. 79–98.
- [3084] M. J. SICLARI, *Asymmetric separated flows over slender bodies at supersonic speeds*, Comput. Syst. Eng., 1 (1990), pp. 447–460.
- [3085] ———, *Asymmetric separated flows at supersonic speeds*, AIAA J., 30 (1992), pp. 124–133.
- [3086] D. SIDILKOVER, *Numerical Solution to Steady-State Problems with Discontinuities*, PhD thesis, Weizmann Institute, Rehovot, Isreal, 1989.
- [3087] ———, *A genuinely two-dimensional scheme for the compressible Euler equations*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 707–719.
- [3088] D. SIDILKOVER AND U. M. ASCHER, *A multigrid solver for the steady state Navier Stokes equations using the pressure Poisson formulation*, Comput. Appl. Math., 14 (1995), pp. 21–35.
- [3089] D. SIDILKOVER AND A. BRANDT, *Multigrid solution to steady-state 2D conservation laws*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 2, Denver, 1991, University of Colorado, pp. 203–242.
- [3090] ———, *Multigrid solution to steady-state two-dimensional conservation laws*, SIAM J. Numer. Anal., 30 (1993), pp. 249–274.
- [3091] D. SIDILKOVER AND G. E. KARNIADAKIS, *Non-oscillatory spectral element Chebyshev method for shock wave calculations*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 566–585.
- [3092] A. S. SILVA, *Técnica de multi-grid aplicada ao método dos elementos finitos*, master's thesis, Campo Montenegro, São Jos'e dos Campos, SP, Brazil, 1990.
- [3093] D. SILVESTER AND A. WATHEN, *Fast iterative solution of stabilised Stokes systems part II: using general block preconditioners*, SIAM J. Numer. Anal., 31 (1994), pp. 1352–1367.
- [3094] T. SIMCHONY AND R. CHELLAPPA, *Direct analytical methods for solving Poisson equations in computer vision problems*, IEEE Trans. Pattern Anal. Mach. Intell., 12 (1990), pp. 435–446.
- [3095] H. D. SIMON, *Partitioning of unstructured problems for parallel processing*, Comput. Syst. Eng., 2 (1991), pp. 135–148.
- [3096] V. SIMONCINI, *A new variant of restarted GMRES*, Numer. Lin. Alg. Appl., 6 (1999), pp. 61–77.
- [3097] R. B. SIMPSON, *A data base abstraction of describing triangular mesh algorithms*, BIT, 37 (1997), pp. 138–163.
- [3098] J. SINGH, C. HOLT, J. HENNESSY, AND A. GUPTA, *Parallel adaptive fast multipole method*, in Proceedings of the Supercomputing Conference 1993, Los Alamitos, 1993, IEEE, Computer Society Press, pp. 54–65.
- [3099] S. SIVALOGANATHAN, *The use of local mode analysis in the design and comparison of multi-grid methods*, Comput. Phys. Commun., 65 (1991), pp. 246–252.

- [3100] S. SIVALOGANATHAN AND G. J. SHAW, *An efficient non-linear multigrid procedure for the incompressible Navier–Stokes equations*, Int. J. Numer. Meth. Fluids, 8 (1988), pp. 417–440.
- [3101] S. SIVALOGANATHAN, G. J. SHAW, T. M. SHAH, AND D. R. MAYER, *A comparison of multi-grid methods for the incompressible Navier–Stokes equations*, in Numerical Methods for Fluid Dynamics III, K. W. Morton and M. J. Baines, eds., Oxford University Press, Oxford, 1988, pp. 410–417.
- [3102] G. E. SJODEN AND A. HAGHIGHAT, *Simplified multigrid acceleration in the PENTRAN 3-D parallel code*, Trans. Am. Nucl. Soc., 75 (1996), pp. 152–154.
- [3103] M. D. SKOGEN, *Schwarz Methods and Parallelism*, PhD thesis, University of Bergen, Bergen, Norway, 1992.
- [3104] A. L. SKOROKHODOV, *Domain decomposition method in partila symmetric eigenvalue problem*, in Fourth International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, Y. A. Kuznetsov, G. A. Meurant, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1991, SIAM, pp. 82–87.
- [3105] G. L. G. SLEIJPEN AND D. R. FOKKEMA, *$BiCGstab(L)$ for linear equations involving unsymmetric matrices with complex spectrum*, Elect. Trans. Numer. Anal., 1 (1993), pp. 11–32.
- [3106] B. F. SMITH, *Domain Decomposition Algorithms for the Partial Differential Equations of Linear Elasticity*, PhD thesis, Courant Institute of Mathematical Sciences, New York, 1990.
- [3107] ———, *A domain decomposition algorithm for elliptic problems in three dimensions*, Numer. Math., 60 (1991), pp. 219–234.
- [3108] ———, *An iterative substructuring algorithm for problems in three dimensions*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 91–98.
- [3109] ———, *An optimal domain decomposition preconditioner for the finite element solution of linear elasticity problems*, SIAM J. Sci. Stat. Comput., 13 (1992), pp. 364–378.
- [3110] ———, *A parallel implementation of an iterative substructuring algorithm for problems in three dimensions*, SIAM J. Sci. Comput., 14 (1993), pp. 406–423.
- [3111] B. F. SMITH, P. E. BJØRSTAD, AND W. D. GROPP, *Domain Decomposition: Parallel Multilevel Methods for Elliptic Partial Differential Equations*, Cambridge University Press, New York, 1996.
- [3112] B. F. SMITH AND O. WIDLUND, *A domain decomposition algorithm using a hierarchical basis*, SIAM J. Sci. Stat. Comput., 11 (1990), pp. 1212–1226.
- [3113] D. M. SMITH AND A. D. GOSMAN, *An application of multigrid with local grid refinement to fluid flow calculations*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 2, Denver, 1991, University of Colorado, pp. 151–172.
- [3114] K. M. SMITH, W. K. COPE, AND S. P. VANKA, *Multigrid procedure for three-dimensional flows on non-orthogonal collocated grids*, Int. J. Numer. Meth. Fluids, 17 (1993), pp. 887–904.
- [3115] R. A. SMITH AND A. WEISER, *Semicoarsening multigrid on a hypercube*, SIAM J. Sci. Stat. Comput., 13 (1992), pp. 1314–1329.
- [3116] W. A. SMITH, *Multigrid solution of transonic flow on unstructured grids*, in Proc. Recent Advances and Applications in Computational Fluid Dynamics, O. Baysal, ed., 1990.
- [3117] M. D. SMOOKE AND V. GIOVANGIGLI, *Numerical modeling of axisymmetric laminar diffusion flames*, IMPACT Comput. Sci. Engng., 4 (1992), pp. 46–79.
- [3118] M. D. SMOOKE AND R. M. M. MATTHEIJ, *On the solution of nonlinear two-point boundary value problems on successively refined grids*, Applied Numer. Math., 1 (1985), pp. 463–487.
- [3119] M. D. SMOOKE, J. A. MILLER, AND R. J. KEE, *On the use of adaptive grids in numerically calculating adiabatic flame speeds*, in Numerical Methods in Laminar Flame Propagation, N. Peters and J. Warnatz, eds., Friedr. Vieweg & Sohn, Braunschweig, 1982, pp. 65–70.
- [3120] M. D. SMOOKE, R. E. MITCHELL, AND J. F. GRCAR, *Numerical solution of a confined laminar diffusion flame*, in Elliptic Problem Solvers II, G. Birkhoff and A. Schoenstadt, eds., Academic Press, New York, 1984, pp. 557–568.
- [3121] M. D. SMOOKE, R. E. MITCHELL, AND D. E. KEYES, *Numerical solution of two-dimensional axisymmetric laminar diffusion flames*, Combust. Sci. and Tech., 67 (1989), pp. 85–122.
- [3122] S. L. SOBOLEV, *The Schwarz algorithm in the theory of elasticity*, Sokl. Acad. N. USSR, IV (XIII) (1936), pp. 236–238.

- [3123] P. M. SOKOL, *Multigrid solution of the Navier–Stokes equations on highly stretched grids*, Int. J. Numer. Meth. Fluids, 17 (1993), pp. 543–566.
- [3124] Z. SOFERMAN, *Computerized Optical Microscopy*, PhD thesis, Weizmann Institute of Science, Rehovot, Israel, March 1989.
- [3125] A. D. SOKAL, *New numerical algorithms for critical phenomena (Multi-grid methods and all that)*, in Computer Simulation Studies in Condensed Matter Physics: Recent Developments, D. P. Landau, K. K. Mon, and H.-B. Schüttler, eds., Springer-Verlag, 1988.
- [3126] ———, *How to beat critical slowing-down: 1990 update*, Nucl. Phys. B, Proc. Suppl., 20 (1991), pp. 55–67.
- [3127] ———, *Bosonic algorithms*, in Quantum Fields on the Computer, M. Creutz, ed., World Scientific, Singapore, 1992, pp. 211–274.
- [3128] ———, *Some comments on multigrid methods for computing propagators*, Phys. Lett. B, 317 (1993), pp. 399–408.
- [3129] P. M. SOKOL, *Multigrid solution of the Navier–Stokes equations on highly stretched grids with defect correction*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 605–619.
- [3130] K. SOLCHENBACH, *Grid applications on distributed memory architectures: implementation and evaluation*, Parallel Comput., 7 (1988), pp. 341–356.
- [3131] K. SOLCHENBACH, K. STÜBEN, U. TROTTERBERG, AND K. WITSCH, *Efficient solution of a nonlinear heat conduction problem by use of fast reduction and multigrid methods*, in Numerical Integration of Differential Equations and Large Linear Systems, J. Hinze, ed., vol. 968 of Lecture Notes in Mathematics, Berlin, 1982, Springer-Verlag, pp. 114–148.
- [3132] K. SOLCHENBACH, C. A. THOLE, AND U. TROTTERBERG, *Parallel multigrid methods: Implementation on SUPRENUM-like architectures and applications*, in Supercomputing, vol. 297 of Lecture Notes in Computer Science, New York, 1987, Springer-Verlag, pp. 28–42.
- [3133] K. SOLCHENBACH AND U. TROTTERBERG, *SUPRENUM: system essentials and grid applications*, Parallel Comput., 7 (1988), pp. 265–281.
- [3134] S. SOLOMON AND P. G. LAUWERS, *Parallel-transported multigrid beats conjugate gradient*, in Workshop on Fermion Algorithms, HLRZ, KFA Jülich, Germany, 1991, H. J. Herrmann and F. Karsch, eds., Singapore, 1992, World Scientific, pp. 149–160.
- [3135] S. SOLOMON, D. STANHILL, AND K. WOLOWELSKY, *Dynamical algebraic multi-grid in simulations of free fields on random triangulated surfaces*, Comput. Phys. Commun., 83 (1994), pp. 23–29.
- [3136] B. P. SOMMEIJER AND P. J. HOUWEN, *Algorithm 621; Software with low storage requirements for two-dimensional, nonlinear, parabolic differential equations*, ACM Trans. Math. Soft., 10 (1984), pp. 378–396.
- [3137] P. SONNEVELD, *CGS: a fast Lanczos-type solver for nonsymmetric linear systems*, SIAM J. Sci. Stat. Comput., 10 (1989), pp. 36–52.
- [3138] P. SONNEVELD, P. WESSELING, AND P. M. DE ZEEUW, *Multigrid and conjugate gradient methods as convergence acceleration techniques*, in Multigrid Methods for Integral and Differential Equations, D. J. Paddon and H. Holstein, eds., vol. 3 of The Institute of Mathematics and its Applications Conference Series, Clarendon Press, Oxford, 1985, pp. 117–168.
- [3139] ———, *Multigrid and conjugate gradient acceleration of basic iterative methods*, in Numerical Methods for Fluid Dynamics II, K. W. Morton and M. J. Baines, eds., Clarendon Press, Oxford, 1986, pp. 347–368.
- [3140] M. SOSONKINA, J. T. MELSON, Y. SAAD, AND L. T. WATSON, *Preconditioning strategies for linear systems arising in tire design*, Numer. Lin. Alg. Appl., 7 (2000), pp. 743–757.
- [3141] D. SOULAT AND S. DEVRIES, *Mechanical criteria for decomposition into subdomains*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 802–808.
- [3142] J. C. SOUTH AND A. BRANDT, *Application of a multi-level grid method to transonic flow calculations*, in Transonic Flow Problems in Turbomachinery, T. C. Adamson and M. F. Platzer, eds., Hemisphere, Washington, D.C., 1977.
- [3143] R. V. SOUTHWELL, *Relaxation Methods in Engineering Science*, Oxford University Press, Oxford, 1940.
- [3144] S. P. SPEKREIJSE, *Second order accurate upwind solutions of the 2D steady Euler equations by the use of a defect correction method*, in Multigrid Methods II, W. Hackbusch and U. Trotterberg, eds., Berlin, 1986, Springer-Verlag, pp. 285–300.
- [3145] ———, *Multigrid solution of monotone second-order discretization of hyperbolic conservation*

- laws*, Math. Comp., 49 (1987), pp. 135–155.
- [3146] ———, *Multigrid Solution of the Steady Euler Equations*, PhD thesis, CWI, Amsterdam, 1987.
- [3147] S. P. SPEKREUSE, *Elliptic grid generation based on Laplace equations and algebraic transformations*, J. Comput. Phys., 118 (1995), pp. 38–61.
- [3148] F. SPENGERMANN AND W. BOOZ, *Domain decomposition method for large scale structural optimization*, in 20th Design Automation Conference American Society of Mechanical Engineers, Design Engineering Division, vol. 69–2, New York, NY, 1994, ASME, pp. 171–177.
- [3149] G. D. SPIEGELEER AND A. LERAT, *A quasi-exact interface condition for implicit multiblock Euler and Navier–Stokes calculations*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 809–816.
- [3150] R. M. SPITALERI, *A multigrid method for grid generation with line spacing control*, Appl. Math. Comput., 40 (1990), pp. 125–134.
- [3151] C. T. SPRING AND A. C. CANGELLARIS, *Application of domain decomposition methods for numerical modeling of wave phenomena on serial and parallel computer architectures*, in Second International Conference on Computation in Electromagnetics, 1994, pp. 371–374.
- [3152] ———, *Parallel implementation of domain decomposition methods for the electromagnetic analysis of guided wave systems*, J. Electromagnetic Waves Appl., 9 (1995), pp. 175–192.
- [3153] K. SRINIVASAN AND S. G. RUBIN, *Adaptive multigrid domain decomposition solutions for the reduced Navier–Stokes equations*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 586–596.
- [3154] ———, *Segmented multigrid domain decomposition procedure for incompressible viscous flows*, Int. J. Numer. Methods Fluids, 15 (1992), pp. 1333–1355.
- [3155] ———, *Segmented domain decomposition multigrid solutions for two and three-dimensional viscous flows*, J. Fluids Engng. Trans. ASME, 115 (1993), pp. 608–613.
- [3156] A. K. SRIVASTAVA, F. C. SZE, AND J. ASMUSSEN, *Discharge characteristics of a 5 cm multipolar electron cyclotron resonance ion source*, Rev. Sci. Instrum., 65 (1994), p. 1310.
- [3157] L. STALS, *Implementation of multigrid on parallel machines using adaptive finite element methods*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 488–496.
- [3158] J. STEELANT AND E. DICK, *A multigrid method for the compressible Navier–Stokes equations coupled to the $k - \epsilon$ turbulence equations*, Int. J. Num. Meth. Heat Fluid Flow, 4 (1994), pp. 99–113.
- [3159] J. STEELEN, E. DICK, AND S. PATTIJN, *Analysis of multigrid efficiency for viscous low mach number flows*, in Multigrid Methods V, vol. 3 of Lecture Notes in Computational Science and Engineering, Berlin, 1998, Springer, pp. 289–305.
- [3160] J. STEFANOVSKI, *Generating equations approach for quadratic matrix equations*, Numer. Lin. Alg. Appl., 6 (1999), pp. 295–326.
- [3161] B. STEFFEN, *Überlegungen zur Berechnung von Hohlraumresonatoren*, in Rechnerarchitekturen für die numerische Simulation auf der Basis superschneller Lösungsverfahren II, U. Trottenberg and P. Wypior, eds., GMD-Studien Nr. 102, Gesellschaft für Mathematik und Datenverarbeitung, St. Augustin, 1985, pp. 287–296.
- [3162] ———, *Multigrid methods for calculation of electromagnetists and their implementation on MIMD computers*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 597–603.
- [3163] J. L. STEGER, F. C. DOUGHERTY, AND J. A. BENEK, *A chimera grid scheme*, in Advances in Grid Generation, K. Ghia, ed., vol. 5, ASME-FED, 1983, pp. 59–69.
- [3164] J. L. STEGER AND R. F. WARMING, *Flux vector splitting for the inviscid gasdynamic equations with application to finite-difference methods*, J. Comput. Phys., 40 (1981), pp. 263–293.
- [3165] T. STEIDTEN, *Application of multigrid methods to mechanical and thermo-mechanical problems*, in Fifth Multigrid Seminar Eberswalde, May 14–18, 1990, S. Hengst, ed., Berlin, 1990, Karl-Weierstrass-Institut, pp. 85–96. Report R-MATH-09/90.
- [3166] ———, *FEMGM – a multilevel program for 2D problems*, in GAMM-Seminar on Multigrid-Methods, Gosen, Germany, September 21–25, 1992, S. Hengst, ed., Berlin, 1993, IAAS, pp. 49–56. Report No. 5.
- [3167] O. STEINBACH, *Boundary elements in domain decomposition methods*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh

- International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 343–348.
- [3168] O. STEINBACH AND W. L. WENDLAND, *Efficient preconditioners for boundary element methods and their use in domain decomposition methods*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 3–18.
- [3169] ———, *Hierarchical boundary element preconditioners in domain decomposition methods*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 497–503.
- [3170] P. STEINFELD, L. LEQUETTE, AND E. ZNATY, *First attempt to parallelise a CFD application software package: The CALIFE code*, Future Gener. Comput. Syst., 11 (1995), pp. 71–86.
- [3171] V. A. STEKLOV, *General Methods for Solving Basic Problems of Mathematical Physics*, Mathematical Society of Charkov, Charkov, Russia, 1901.
- [3172] E. STERNER, *A multigrid smoother for high Reynolds number flows*, Elect. Trans. Numer. Anal., 6 (1997), pp. 234–245.
- [3173] H. J. STETTER, *The defect correction principle and discretization methods*, Numer. Math., 29 (1978), pp. 425–443.
- [3174] H. STEVE, *Schémas implicites linéarisé décentrés pour la résolution des équations d'Euler en plusieurs dimensions*, PhD thesis, University of Marseilles, France, 1988.
- [3175] R. STEVENSON, *Robust multi-grid with 7-point ILU smoothing*, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 295–307.
- [3176] R. P. STEVENSON, *On the Validity of Local Mode Analysis of Multi-Grid Methods*, PhD thesis, University of Utrecht, Utrecht, 1990.
- [3177] ———, *New estimates of the contraction number of V-cycle multigrid with applications to anisotropic equations*, in Incomplete Decompositions (ILU)–Algorithms, Theory, and Applications, Proceedings of the Eighth GAMM–Seminar, Kiel 1992, vol. 41 of NNM, Braunschweig, 1993, Vieweg, pp. 159–167.
- [3178] ———, *Robustness of multi-grid applied to anisotropic equations on convex domains and on domains with re-entrant corners*, Numer. Math., 66 (1993), pp. 373–398.
- [3179] ———, *Piecewise linear (pre-)wavelets on non-uniform meshes*, in Multigrid Methods V, vol. 3 of Lecture Notes in Computational Science and Engineering, Berlin, 1998, Springer, pp. 306–319.
- [3180] A. STEWART AND G. J. SHAW, *A parallel multigrid fas scheme for transputer networks*, Parallel Comput., 16 (1990), pp. 335–342.
- [3181] J. STILLER, W. E. NAGEL, AND U. FLADRICH, *Scalability of parallel multigrid adaption*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer–Verlag, pp. 228–234.
- [3182] T. STOERTKUHL, C. ZENGER, AND S. ZIMMER, *Asymptotic solution for the singularity at the angular point of the lid driven cavity*, Int. J. Numer. Meth. Heat Fluid Flow, 4 (1994), pp. 47–59.
- [3183] L. C. STONE, S. B. SHUKLA, AND B. NETA, *Parallel satellite orbit prediction using a work-station cluster*, Comput. Math. Appl., 28 (1994), pp. 1–8.
- [3184] O. O. STORAASLI, D. T. NGUYEN, M. A. BADDOURAH, AND J. QIN, *Computational mechanics analysis tools for parallel vector supercomputers*, Comput. Syst. Eng., 4 (1993), pp. 349–354.
- [3185] M. STORTI, *Numerical Simulation of Unsteady Potential Flows in Aerodynamics*, PhD thesis, INTEC, Santa Fe, Argentina, 1990.
- [3186] M. STORTI, N. NIGRO, AND S. IDELSOHN, *Adaptive refinement criterion for elliptic problems discretized by FEM*, Comm. Numer. Meth. Engrg., 9 (1993), pp. 729–743.
- [3187] B. STOUFFLET, *Implicit finite-element methods for the Euler equations*, in Numerical methods for the Euler Equations of Fluid Dynamics, F. Angrand, A. Dervieux, J. A. Desideri, and R. Glowinski, eds., vol. 21 of Proceedings in Applied Mathematics, SIAM, Philadelphia, 1985, pp. 409–434.
- [3188] B. STOUFFLET, J. PÉRIAUX, L. FEZOUI, AND A. DERVIEUX, *Numerical simulation of 3-D Euler flows around space vehicles using adapted finite elements*, AIAA, 87–0560 (1987).
- [3189] G. STOYAN AND R. STOYAN, *Colouring the discretization graphs arising in the multigrid method*, Comput. Math. Appl., 22 (1991), pp. 55–62.
- [3190] L. G. STRAKHOVSKAYA, *An iterative method for evaluating the first eigenvalue of an elliptic operator*, U.S.S.R. Comput. Math. and Math. Phys., 17, no. 3 (1977), pp. 88–101.

- [3191] G. STRANG, *Approximation in the finite element method*, Numer. Math., 19 (1972), pp. 81–98.
- [3192] G. STRANG AND G. FIX, *An Analysis of the Finite Element Method*, Prentice-Hall, Englewood Cliffs, NJ, 1973.
- [3193] C. L. STREET AND M. G. MACARAEG, *Spectral multi-domain for large-scale fluid dynamics simulations*, Appl. Numer. Math., 6 (1989), pp. 123–139.
- [3194] C. L. STREETT, T. A. ZANG, AND M. Y. HUSSAINI, *Spectral multigrid methods with applications to transonic potential flow*, in Preliminary Proc. Internat. Multigrid Conference, Ft. Collins, 1983, Institute for Computational Studies at Colorado State University.
- [3195] ———, *Spectral multigrid methods with applications to transonic potential flow*, Comput. Phys., 56 (1984).
- [3196] T. STREIT, *Euler and Navier-Stokes solutions for supersonic flow around a complex missile*, J. Spacecraft Rockets, 31 (1994), pp. 600–608.
- [3197] A. H. STROUD AND D. SECREST, *Gaussian Quadrature Formulas*, Prentice-Hall, Englewood Cliffs, NJ, 1966.
- [3198] R. M. STUBBS, *Multiple-grid strategies for accelerating the convergence of the Euler equations*, in Proceedings of the Fifth GAMM Conference on Numerical Methods in Fluid Mechanics, vol. 7 of Notes on Numerical Fluid Mechanics, Braunschweig, 1983, Vieweg.
- [3199] ———, *Multiple gridding of the Euler equations with an implicit scheme*, AIAA, 83–1945 (1983).
- [3200] K. STÜBEN, *Algebraic multigrid (AMG): experiences and comparisons*, Appl. Math. Comput., 13 (1983), pp. 419–452.
- [3201] ———, *An introduction to algebraic multigrid*, in Multigrid, U. Trottenberg, C. W. Oosterlee, and A. Schüller, eds., Academic Press, London, 2000, pp. 413–532. Appendix A.
- [3202] K. STÜBEN AND J. LINDEN, *Multigrid methods: An overview with emphasis on grid generation processes*, in Proc. First Internat. Conference on Numerical Grid Generations in Computational Fluid Dynamics, J. Häuser, ed., Swansea, 1986, Pinerige Press.
- [3203] K. STÜBEN AND U. TROTENBERG, *Multigrid methods: Fundamental algorithms, model problem analysis and applications*, in Multigrid Methods, W. Hackbusch and U. Trottenberg, eds., vol. 960 of Lecture Notes in Mathematics, Berlin, 1982, Springer-Verlag, pp. 1–176.
- [3204] ———, *On the construction of fast solvers for elliptic equations*, in Computational Fluid Dynamics, Lecture Series 1982–04, Rhode-St.-Gebese, Belgium, 1982.
- [3205] K. STÜBEN, U. TROTENBERG, AND K. WITSCH, *Software development based on multigrid techniques*, in Proc. IFIP-Conference on PDE Software, Modules, Interfaces and Systems, B. Enquist and T. Smedsaas, eds., Sweden, 1983, Söderköping.
- [3206] G. R. STUHNE AND W. R. PELTIER, *Vortex erosion and amalgamation in a new model of large scale flow on the sphere*, J. Comput. Phys., 128 (1996), pp. 58–81.
- [3207] E. D. STURLER, *IBLU preconditioners for massively parallel computers*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 395–400.
- [3208] E. D. STURLER AND D. R. FOKKEMA, *Nested Krylov methods and preserving the orthogonality*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 111–125.
- [3209] C. SU, *Domain decomposition method for determining the diffusion coefficient of a two-dimensional linear diffusion equation in the time domain*, Appl. Numer. Math., 15 (1994), pp. 481–493.
- [3210] P. S. SU AND R. E. FULTON, *A parallel domain decomposition finite element method for massively parallel computers*, Comput. Syst. Eng., 4 (1993), pp. 489–494.
- [3211] I. SUISALU AND E. SAAR, *An adaptive multigrid solver for high resolution cosmological simulations*, Mon. Not. R. Astron. Soc., 274 (1995), pp. 287–299.
- [3212] J.-S. SUN, *Domain decomposition and multilevel PCG method for solving 3-D fourth order problems*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 71–78.
- [3213] M. SUN, *Domain decomposition algorithms for solving Hamilton–Jacobi–Bellman equations*, Numerical Functional Analysis and Optimization, 14 (1993), pp. 145–166.
- [3214] V. H. SUN AND W.-P. TANG, *An overdetermined Schwarz alternating method*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 349–

- [3215] Y.-S. SUN AND A. F. EMERY, *Multigrid computation of natural convection in enclosures with a conductive baffle*, in Fundamentals of Natural Convection American Society of Mechanical Engineers, Heat Transfer Division, R. D. Boyd and P. G. Kroeger, eds., vol. 264, ASME, New York, NY, 1993, pp. 57–67.
- [3216] C. H. SUNG AND T. T. HUANG, *Recent progress in incompressible Reynolds-averaged Navier-Stokes solvers*, J. Hydrodynamics, 8 (1996), pp. 13–30.
- [3217] M. SURRIDGE, D. J. TILDESLEY, Y. C. KONG, AND D. B. ADOLF, *Practical aspects and experiences. a parallel molecular dynamics simulation code for dialkyl cationic surfactants*, Parallel Comput., 22 (1996), pp. 1053–1071.
- [3218] A. SUZUKI, *Implementation of non-overlapping domain decomposition methods on parallel computer ADENA*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 275–282.
- [3219] R. C. SWANSON AND R. RADESPIEL, *Cell centered and cell vertex multigrid schemes for the Navier-Stokes equations*, AIAA J., 29 (1991), pp. 697–703.
- [3220] R. C. SWANSON, E. TURKEL, AND J. A. WHITE, *An effective multigrid method for high-speed flows*, Comm. Appl. Num. Methods, 8 (1992), pp. 671–681.
- [3221] R. C. SWANSON, J. A. WHITE, AND E. TURKEL, *An effective multigrid method for high-speed flows*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 2, Denver, 1991, University of Colorado, pp. 181–189.
- [3222] B. SWARTZ, *Courant-like conditions limit reasonable mesh refinement to order h^2* , SIAM J. Sci. Stat. Comput., 8 (1987), pp. 924–933.
- [3223] P. N. SWARZTRAUBER AND R. A. SWEET, *Vector and parallel methods for the direct solution of poisson's equation*, J. Comput. Appl. Math., 27 (1989), pp. 241–263.
- [3224] P. K. SWEBY, *High resolution schemes using flux limiters for hyperbolic conservation laws*, SIAM J. Numer. Anal., 21 (1984), pp. 995–1011.
- [3225] R. A. SWEET, *A cyclic reduction algorithm for solving block tridiagonal systems of arbitrary dimension*, SIAM J. Numer. Anal., 14 (1977), pp. 706–720.
- [3226] J. SWISHELM, G. M. JOHNSON, AND S. KUMAR, *Parallel computation of Euler and Navier-Stokes flows*, Appl. Math. Comput., 19 (1986), pp. 321–331.
- [3227] J. M. SWISHELM AND G. M. JOHNSON, *Numerical simulation of three-dimensional flowfields using the Cyber 205*, in Supercomputer Applications, R. W. Numrich, ed., Lecture Notes in Physics, Plenum, New York, 1984.
- [3228] A. SYDOW, *Parallel simulation of air pollution*, IFIP Trans. A, Comput. Sci. Technol., 52 (1994), pp. 605–612.
- [3229] B. SZABÓ AND I. BABUŠKA, *Finite Element Analysis*, John Wiley & Sons, New York, 1991.
- [3230] R. SZELISKI, *Fast surface interpolation using hierarchical basis functions*, IEEE Trans. Pattern Anal. Mach. Intell., 12 (1990), pp. 513–528.
- [3231] R. SZELISKI AND D. TERZOPoulos, *Parallel multigrid algorithms and applications to computer vision*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 3, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 117–130.
- [3232] ———, *Parallel multigrid algorithms and computer vision applications*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 383–398.
- [3233] D. B. SZYLD AND O. B. WIDLUND, *Variational analysis of some conjugate gradient methods*, E. W. J. Numer. Math., 1 (1993), pp. 51–74.
- [3234] S. TA'ASAN, *Multigrid Methods for Highly Oscillatory Problems*, PhD thesis, Weizmann Institute of Science, Rehovot, Israel, 1984.
- [3235] ———, *Multigrid method for stability problems*, J. Supercomput., 3 (1988), pp. 261–274.
- [3236] ———, *Optimal multigrid method for inviscid flows*, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 309–320.
- [3237] ———, *From molecular dynamics to continuum models*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 235–241.
- [3238] S. TA'ASAN AND A. BRANDT, *Multigrid solutions to quasi-elliptic schemes*, in Progress in Supercomputing in Computational Fluid Dynamics, E. Murman and S. Abarbanel, eds., 1984, pp. 235–255.

- [3239] S. TA'ASAN AND H. ZHANG, *Fourier-Laplace analysis of the multigrid waveform relaxation method for hyperbolic equations*, BIT, 36 (1996), pp. 831–841.
- [3240] T. R. TAHA, *A parallel algorithm for an investigation of self-focusing singularity of higher KdV equations*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 597–604.
- [3241] C.-H. TAI, J.-H. SHEU, AND B. LEER, *Optimal multistage schemes for Euler equations with residual smoothing*, AIAA J., 33 (1995), pp. 1008–1016.
- [3242] M. S. TAI, *Parallel implicit Navier-Stokes solver on the Intel Paragon*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North-Holland), Amsterdam, 1995, pp. 333–340.
- [3243] X.-C. TAI, *Global extrapolation with a parallel splitting method*, Numer. Alg., 3 (1992), pp. 427–440.
- [3244] ———, *Domain decomposition for linear and nonlinear elliptic problems via function or space decomposition*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 355–360.
- [3245] ———, *Parallel function and space decomposition methods*, in The Finite element Method: Fifty years of the Courant Element, P. Neittanmäki, ed., vol. 164 of Lecture Notes in Pure and Applied Mathematics, New York, 1994, Marcel Dekker, pp. 421–432.
- [3246] ———, *Parallel function and space decomposition methods – Part I. function decomposition*, Beijing Math., 1, part 2 (1995), pp. 104–134.
- [3247] ———, *Parallel function and space decomposition methods – Part II. space decomposition*, Beijing Math., 1, part 2 (1995), pp. 135–152.
- [3248] X.-C. TAI AND M. ESPEDAL, *A space decomposition method for minimization problems*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 509–516.
- [3249] X.-C. TAI, T. O. W. JOHANSEN, AND H. K. D. M. S. ESPEDAL, *A characteristic domain splitting method*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 317–323.
- [3250] X.-C. TAI AND T. KARKAINEN, *Identification of a nonlinear parameter in a parabolic equation from a linear equation*, Comp. Appl. Mat., 14 (1995), pp. 157–184.
- [3251] X.-C. TAI AND P. NEITTANMÄKI, *A FE-splitting-up method and its application to distributed parameter identification of parabolic type*, in Approximation, Optimisation and Computing. Theory and Applications, Amsterdam, 1990, Elsevier, pp. 185–188.
- [3252] ———, *A linear approach for the nonlinear distributed parameter identification*, in Numerical Methods for Free Boundary Problems, P. Neittanmäki, ed., vol. 99 of International Series of Numerical Mathematics, Basel, 1991, Birkhäuser Verlag, pp. 401–411.
- [3253] ———, *On the numerical solution of the distributed parameter parameter identification problem*, in Control and Estimation of Distributed Parameter Systems, vol. 100, Basel, 1991, Birkhäuser Verlag, pp. 317–329.
- [3254] ———, *A parallel finite element splitting-up methods for parabolic problem*, Numerical Methods for Partial Differential Equation, 7 (1991), pp. 209–225.
- [3255] ———, *Error estimates for numerical identification of distributed parameters*, J. Comp. Math., supplementary issue (1992), pp. 66–78.
- [3256] P. L. TALLEC AND M. VIDRASCU, *Generalized Neumann-Neumann preconditioners for iterative substructuring*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 413–425.
- [3257] K. H. TAN AND M. J. A. BORSBOOM, *On generalized Schwarz coupling applied to advection-dominated problems*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 125–130.
- [3258] ———, *Domain decomposition with patched subgrids*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 117–124.
- [3259] T. TANG AND D. B. INGHAM, *Multigrid solutions of steady two dimensional flow past a cascade of sudden expansions*, Comput. Fluids, 21 (1992), pp. 647–660.
- [3260] W.-P. TANG, *Schwarz Splitting and Template Operators*, PhD thesis, Stanford University,

- Stanford, CA, 1987.
- [3261] ———, *Wavefront elimination and renormalization*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 235–246.
- [3262] ———, *Generalized Schwarz splittings*, SIAM J. Sci. Stat. Comput., 13 (1992), pp. 573–595.
- [3263] ———, *Numerical solution of a turning point problem*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 330–338.
- [3264] O. TATEBE, *The multigrid preconditioned conjugate gradient method*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 621–634.
- [3265] S. TATSUMI, L. MARTINELLI, AND A. JAMESON, *Flux-limited schemes for the compressible Navier–Stokes equations*, AIAA J., 33 (1995), pp. 252–261.
- [3266] A. C. TAYLOR, W.-F. NG, AND R. W. WALTERS, *Upwind relaxation methods for the Navier–Stokes equations using inner iterations*, J. Comput. Phys., 99 (1992), pp. 68–72.
- [3267] R. TEIGLAND, *On Multilevel Methods for Numerical Reservoir Simulation*, PhD thesis, University of Bergen, Norway, 1991. Report No. 92, October 1991, ISSN 0084-778x.
- [3268] ———, *An additive Schwarz procedure for complex flows*, in Proceedings of the Third Annual Conference of the CFD Society of Canada, 1995, pp. 145–152.
- [3269] ———, *A domain decomposition strategy for simulation of industrial fluid flows*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 817–826.
- [3270] ———, *On some variational acceleration techniques and related methods for local refinement*, Int. J. Numer. Meth. Fluids, 28 (1998), pp. 945–960.
- [3271] R. TEIGLAND AND G. E. FLADMARK, *Multilevel methods in porous media flow*, in Second European Conference on the Mathematics of Oil Recovery, Paris, 1990, Éditions Technip, pp. 355–358.
- [3272] ———, *Cell-centered multilevel methods in reservoir simulation*, in International Series of Numerical Mathematics, vol. 98, Birkhäuser Verlag, Basel, 1991, pp. 365–376.
- [3273] K. TEREKHOVA, *Capacitance matrix preconditioning*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 525–531.
- [3274] G. TERRASSON, *Simulation Numérique en Éléments Finis d’Écoulements de Fluides Visqueux Incompressibles et Compressibles par une Méthode de Couplage des Équations de Navier–Stokes et du Potentiel*, PhD thesis, Université Pierre et Marie Curie, June 1989.
- [3275] D. TERZOPoulos, *Multilevel computational processes for visual surface reconstruction*, Computer Vision, Graphics, and Image Processing, 24 (1983), pp. 52–96.
- [3276] ———, *Concurrent multilevel relaxation*, in Image Understanding Workshop, Science Applications International Corp., 1985, pp. 156–162.
- [3277] ———, *Image analysis using multigrid relaxation methods*, IEEE Trans. Pattern Anal. Mach. Intell., 8 (1986), pp. 129–139.
- [3278] ———, *Regularization of inverse visual problems involving discontinuities*, IEEE Trans. Pattern Anal. Mach. Intell., 8 (1986), pp. 413–424.
- [3279] ———, *The computation of visible-surface representations*, IEEE Trans. Pattern Anal. Mach. Intell., PAMI-10(4) (1988), pp. 417–438.
- [3280] A. H. TEWFIK AND H. GARNAOUI, *Multigrid implementation of a hypothesis testing approach to parametric blur identification and image restoration*, J. Opt. Soc. Am. A, Opt. Image Sci., 8 (1991), pp. 1026–1037.
- [3281] T. E. TEZDUYAR, M. BEHR, S. K. ALIABADI, S. MITTAL, AND S. E. RAY, *A new mixed preconditioning method based on the clustered element-by-element preconditioners*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 215–222.
- [3282] T. E. TEZDUYAR AND D. K. GANJOO, *Petrov–Galerkin formulations with weighting functions dependent upon spatial and temporal discretization: Application to transient convection–diffusion problems*, Comput. Meth. Appl. Mech. Engrg., 59 (1986), pp. 47–71.
- [3283] T. E. TEZDUYAR, R. GLOWINSKI, AND J. LIOU, *Petrov–Galerkin methods on multi-connected domains for the vorticity –Stream function formulation of the incompressible Navier–Stokes equations*, Int. J. Numer. Meth. Fluids, 8 (1988), pp. 1269–1290.
- [3284] T. E. TEZDUYAR, J.-L. LIONS, T. NGUYEN, AND S. POOLE, *Adaptive implicit–explicit and parallel element–by–element iteration schemes*, in Domain Decomposition Methods,

- T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., SIAM, Philadelphia, 1989, pp. 443–463.
- [3285] T. E. TEZDUYAR AND J. LIOU, *Element-by-element and implicit-explicit finite element formulations for computational fluid dynamics*, in First International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. Périaux, eds., Philadelphia, 1988, SIAM, pp. 281–300.
- [3286] ———, *Grouped element-by-element iteration schemes for incompressible flow computations*, Comput. Phys. Commun., 53 (1989), pp. 441–453.
- [3287] T. E. TEZDUYAR, J. LIOU, T. NGUYEN, AND S. POOLE, *Adaptive implicit-explicit and parallel element-by-element iterative schemes*, in Proceedings of the Second International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1989, SIAM, pp. 443–463.
- [3288] F. C. THAMES, *Multigrid application to three-dimensional elliptic coordinate generation*, in Preliminary Proc. Internat. Multigrid Conference, S. F. McCormick, ed., Ft. Collins, CO, 1983, Institute for Computational Studies at Colorado State University.
- [3289] H. J. THIEBES, *Mehrgittermethoden und Reduktionsverfahren für indefinit elliptische Randwertaufgaben*, PhD thesis, Institut für Angewandte Mathematik, Universität Bonn, 1983.
- [3290] J. M. THIJSSEN, *Multigrid with an immersed interface*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 242–248.
- [3291] C.-A. THOLE, *Beiträge zur Fourieranalyse von Mehrgittermethoden: V-cycle, ILU-Glättung, anisotrope Operatoren*, PhD thesis, Institut für Angewandte Mathematik, Universität Bonn, 1983.
- [3292] ———, *Mehrgitterverfahren für anisotrope 3D-Aufgaben: Anforderungen an MIMD-Rechnerarchitekturen*, in Rechnerarchitekturen für die numerische Simulation auf der Basis superschneller Lösungsverfahren II, U. Trottenberg and P. Wypior, eds., GMD-Studien Nr. 102, Gesellschaft für Mathematik und Datenverarbeitung, St. Augustin, 1985, pp. 297–312.
- [3293] C. A. THOLE, S. MAYER, AND A. SUPALOV, *Fast solution of MSC/NASTRAN sparse matrix problems using a multilevel approach*, Elect. Trans. Numer. Anal., 6 (1997), pp. 246–254.
- [3294] C.-A. THOLE AND U. TROTTERNBERG, *Basic smoothing procedures for the multigrid treatment of elliptic 3D-operators*, in Advances in Multi-Grid Methods, D. Braess, W. Hackbusch, and U. Trottenberg, eds., vol. 11 of Notes on Numerical Fluid Mechanics, Braunschweig, 1985, Vieweg, pp. 102–111.
- [3295] ———, *Basic smoothing procedures for the multigrid treatment of elliptic 3D-operators*, Appl. Math. Comput., 19 (1986), pp. 333–345.
- [3296] ———, *A short note on standard parallel multigrid algorithms for 3D-problems*, in Supercomputing, A. Lichnewsky and C. Saguez, eds., North-Holland, Amsterdam, 1987, pp. 275–286.
- [3297] ———, *A short note on standard parallel multigrid algorithms for 3D problems*, Appl. Math. Comput., 27 (1988), pp. 101–115.
- [3298] J. L. THOMAS, *An implicit multigrid scheme for hypersonic strong-interaction flowfields*, Comm. Appl. Num. Methods, 8 (1992), pp. 683–693.
- [3299] J. L. THOMAS, D. H. RUDY, S. R. CHAKRAVARTHY, AND R. W. WALTERS, *Patched-grid computations of high-speed inlet flows*, in Symposium on Advances and Applications in Computational Fluid Dynamics, vol. 66, ASME FED, 1988, pp. 11–22.
- [3300] J. L. THOMAS, R. W. WALTERS, T. REU, F. GHAFARI, R. P. WESTON, AND J. M. LUCKRING, *A patched-grid algorithm for complex configurations directed towards the F/A-18 aircraft*, AIAA, 89-0121 (1989).
- [3301] J.-M. THOMAS, *Finite element matching methods*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 99–105.
- [3302] J.-M. THOMAS AND D. TRUJILLO, *Finite volume variational formulation. Application to domain decomposition methods*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition, vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 127–132.
- [3303] J. W. THOMAS, M. A. HEROUX, S. M. MCKAY, S. F. MCCORMICK, AND A. M. THOMAS, *Application of the time dependent fast adaptive composite grid method to computa-*

- tional fluid dynamics*, in Numerical Methods in Laminar and Turbulent Flow, Pineridge, Swansea, 1987, pp. 1071–1082.
- [3304] J. W. THOMAS AND S. M. MCKAY, *Generation of FAC patched grids*, in Numerical Grid Generation in Computational Fluid Mechanics '88, Pineridge, Swansea, 1988.
- [3305] J. W. THOMAS, R. SCHWEITZER, M. A. HEROUX, S. F. MCCORMICK, AND A. M. THOMAS, *Application of the fast adaptive composite grid method to computation fluid dynamics*, in Numerical Methods in Laminar and Turbulent Flow, C. Taylor, W. G. Habashi, and M. M. Hafez, eds., Pineridge Press, Swansea, U.K., 1987, pp. 1071–1082.
- [3306] F. THOMASSET, *Implementation of Finite Element Methods for Navier–Stokes Equations*, Springer-Verlag, New York, 1981.
- [3307] C. P. THOMPSON, W. R. COWELL, AND G. K. LEAF, *On the parallelization of an adaptive multigrid algorithm for a class of flow problems*, Parallel Comput., 18 (1992), pp. 449–466.
- [3308] C. P. THOMPSON, G. K. LEAF, AND J. R. ROSENDALE, *A dynamically adaptive multigrid algorithm for the incompressible Navier–Stokes equations validation and model problems*, Appl. Numer. Math., 9 (1992), pp. 511–532.
- [3309] C. P. THOMPSON, G. K. LEAF, AND S. P. VANKA, *Application of a multigrid method to a buoyancy-induced flow problem*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 605–629.
- [3310] J. F. THOMPSON, *A survey of dynamically-adaptive grids in the numerical solution of partial differential equations*, Appl. Numer. Math., 1 (1985), pp. 3–27.
- [3311] ———, *A composite grid generation code for general three-dimensional regions*, AIAA, 87–0275 (1987).
- [3312] ———, *The national grid project*, Comput. Syst. Eng., 3 (1992), pp. 393–399.
- [3313] J. F. THOMPSON, B. K. SONI, AND N. P. WEATHERILL, *Grid Generation*, CRC Press, Boca Raton, 1999.
- [3314] J. F. THOMPSON, Z. U. A. WARSI, AND C. W. MASTIN, *Numerical Grid Generation*, Elsevier Science Publishing, Amsterdam, 1985.
- [3315] M. C. THOMPSON AND J. H. FERZIGER, *An adaptive multigrid solution technique for the steady state incompressible Navier–Stokes equations*, in Computational Fluid Dynamics, G. de Vahl Davis and C. Fletcher, eds., North-Holland, Amsterdam, 1988, pp. 715–724.
- [3316] ———, *An adaptive multigrid technique for the incompressible Navier Stokes equations*, J. Comput. Phys., 82 (1989), pp. 94–121.
- [3317] M. THUNE, *Object-oriented software tools for parallel PDE solvers*, Wuhan U. J. Nat. Sci., 1 (1996), pp. 420–429.
- [3318] T. THUNELL AND L. FUCHS, *Numerical solution of the Navier–Stokes equations by multi-grid techniques*, in Numerical Methods in Laminar and Turbulent Flow, C. Taylor and A. B. Schrefler, eds., Swansea, 1981, Pineridge Press, pp. 141–152.
- [3319] T. Y. TIAN AND M. SHAH, *Motion segmentation and estimation*, in Proceedings of 1st International Conference on Image Processing, vol. 2, Los Alamitos, CA, 1994, IEEE Comput. Soc. Press, pp. 785–789.
- [3320] D. M. TIDD, D. J. STRASH, B. EPSTEIN, A. LUNTZ, A. NACHSHON, AND T. RUBIN, *Multigrid Euler calculations over complete aircraft*, J. Aircr., 29 (1992), pp. 1080–1086.
- [3321] M. D. TIDRIRI, *Domain decomposition for compressible Navier Stokes equations with different discretizations and formulations*, J. Comput. Phys., 119 (1995), pp. 271–282.
- [3322] ———, *Hybrid Newton-Krylov/domain decomposition methods for compressible flows*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 532–539.
- [3323] A. K. TOLPADI, *Calculation of heat transfer in a radially rotating coolant passage*, Numer. Heat Transf. A, Appl., 26 (1994), pp. 683–699.
- [3324] E. TOMACRUZ, J. V. SANGHAVI, , AND A. SANGIOVANNI VINCENTELLI, *Algorithms for drift diffusion device simulation using massively parallel processors*, IEICE Trans. Electron., E77-C (1994), pp. 248–254.
- [3325] K. A. TOMKO AND S. G. ABRAHAM, *Data and program restructuring of irregular applications for cache coherent multiprocessors*, in Conference Proceedings. 1994 International Conference on Supercomputing, New York, NY, 1994, ACM, pp. 214–225.
- [3326] C. H. TONG, T. F. CHAN, AND C. C. J. KUO, *A domain decomposition preconditioner based on a change to a multilevel nodal basis*, SIAM J. Sci. Stat. Comput., 12 (1991), pp. 1486–1495.
- [3327] ———, *A multilevel nodal basis domain-decomposed preconditioner*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel

- and S. F. McCormick, eds., vol. 1, Denver, 1991, University of Colorado, pp. 35–44.
- [3328] ———, *Multilevel filtering preconditioners: extensions to more general elliptic problems*, SIAM J. Sci. Stat. Comput., 13 (1992), pp. 227–242.
- [3329] Y. TONGHUI, C. CHENWEN, AND W. LIQIN, *Solution of load distribution on the contact line of helical gears with EHL theory*, in 20th Design Automation Conference American Society of Mechanical Engineers, Design Engineering Division, vol. 69–1, New York, NY, 1994, ASME, pp. 521–524.
- [3330] A. TOSELLI, *Neumann–neumann methods for vector field problems*, Elect. Trans. Numer. Anal., 11 (2000), pp. 1–24.
- [3331] D. TROMEUR-DERVOUD AND F.-X. ROUX, *Parallelization via domain decomposition techniques of multigrid and ADI solvers for Navier–Stokes equations*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North–Holland), Amsterdam, 1995, pp. 349–356.
- [3332] U. TROTTERBERG, *Mehrgitterprinzip und Rechnerarchitektur*, in Rechnerarchitekturen für die numerische Simulation auf der Basis superschneller Lösungsverfahren I, U. Trotterberg and P. Wypior, eds., GMD-Studien Nr. 88, Gesellschaft für Mathematik und Datenverarbeitung, St. Augustin, 1984, pp. 7–30.
- [3333] ———, *Schnelle Lösung elliptischer Differentialgleichungen nach dem Mehrgitterprinzip*, Mitteilungen der GAMM, 1 (1984), pp. 23–41.
- [3334] ———, *Scnelle Lösung elliptischer Differentialgleichungen nach dem Mehrgitterprinzip*, Mitteilungen der GAMM, 1 (1984), pp. 23–41.
- [3335] ———, *Zur SUPRENUM-Konzeption*, in Rechnerarchitekturen für die numerische Simulation auf der Basis superschneller Lösungsverfahren II, U. Trotterberg and P. Wypior, eds., GMD-Studien Nr. 102, Gesellschaft für Mathematik und Datenverarbeitung, St. Augustin, 1985, pp. 313–328.
- [3336] ———, *SUPRENUM – an MIMD multiprocessor system for multi-level scientific computing*, in Lecture Notes in Computer Science, vol. 237, Springer Verlag, Heidelberg, 1986, pp. 48–52.
- [3337] ———, *Proceedings of the 2nd International SUPRENUM Colloquim “Supercomputing based on parallel computer architectures”*, vol. 7 of Parallel Computing, North–Holland, Amsterdam, 1988.
- [3338] U. TROTTERBERG, C. W. OOSTERLEE, AND A. SCHÜLLER, *Multigrid*, Academic Press, London, 2000.
- [3339] U. TROTTERBERG AND P. WYPIOR, *Rechnerarchitekturen für die numerische Simulation auf der Basis superschneller Lösungverfahren I*, GMD-Studien Nr. 88, Gesellschaft für Mathematik und Datenverarbeitung, St. Augustin, 1984.
- [3340] ———, *Rechnerarchitekturen für die numerische Simulation auf der Basis superschneller Lösungverfahren II*, GMD-Studien Nr. 102, Gesellschaft für Mathematik und Datenverarbeitung, St. Augustin, 1985.
- [3341] I. TSUKERMAN, *Fast finite element solvers for problems with magnetic materials*, IEEE Trans. Magn., 29 (1993), pp. 2365–2367.
- [3342] ———, *Application of multilevel preconditioners to finite element magnetostatic problems*, IEEE Trans. Magn., 30 (1994), pp. 3562–3565.
- [3343] Y. TSURI, *Bi-Level Properties of Fourier Transform*, PhD thesis, Weizmann Institute of Science, Rehovot, Israel, March 1988.
- [3344] S. V. TSYNKOVA, *An application of nonlocal external conditions to viscous flow computations*, J. Comput. Phys., 116 (1995), pp. 212–225.
- [3345] J. Y. TU AND L. FUCHS, *Overlapping grids and multigrid methods for three dimensional unsteady flow calculations in IC engines*, Int. J. Numer. Meth. Fluids, 15 (1992), pp. 693–714.
- [3346] ———, *Calculation of flows using three dimensional overlapping grids and multigrid methods*, Int. J. Numer. Meth. Engng., 38 (1995), pp. 259–282.
- [3347] R. S. TUMINARO, *A highly parallel multigrid like method for the solution of the Euler equations*, SIAM J. Sci. Stat. Comput., 13 (1992), pp. 88–100.
- [3348] R. S. TUMINARO AND D. E. WOMBLE, *Analysis of the multigrid FMV cycle on large scale parallel machines*, SIAM J. Sci. Comput., 14 (1993), pp. 1159–1173.
- [3349] M. TUMMALA AND D. A. RICHTER, *Iterative system modeling using multigrid techniques*, in 1993 IEEE International Symposium on Circuits and Systems, vol. 4 of IEEE Proceedings, New York, 1993, IEEE, pp. 2525–2528.
- [3350] S. TUREK, *Multigrid techniques for a divergence-free finite element discretization*, E. W. J. Numer. Math., 2 (1994), pp. 229–255.
- [3351] ———, *Multigrid techniques for simple discretely divergence-free finite element spaces*,

- in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6-9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 321–332.
- [3352] ———, *Tools for simulating non stationary incompressible flow via discretely divergence free finite element models*, Int. J. Numer. Meth. Fluids, 18 (1994), pp. 71–105.
- [3353] ———, *CFD for incompressible flow: numerical efficiency versus gigaflops*, Numer. Lin. Alg. Appl., 7 (2000), pp. 473–482.
- [3354] E. TURKEL, R. C. SWANSON, V. N. VASTA, AND J. A. WHITE, *Multigrid for hypersonic viscous two- and three- dimensional flows*, AIAA, 91–1572 (1991).
- [3355] T. L. TYSINGER AND D. A. CAUGHEY, *Alternating direction implicit methods for the Navier Stokes equations*, AIAA J., 30 (1992), pp. 2158–2161.
- [3356] C. P. TZANOS, *A multigrid method for the solution of incompressible flow equations at high reynolds numbers*, Trans. Amer. Nucl. Soc., 63 (1991), pp. 199–200.
- [3357] ———, *Higher order differencing method with a multigrid approach for the solution of the incompressible flow equations at high Reynolds numbers*, Numer. Heat Transf. B, Fundam., 22 (1992), pp. 179–198.
- [3358] E. TZIPERMAN, I. YAVNEH, AND S. TA’ASAN, *Multilevel turbulence simulations*, Europhys. Lett., 24 (1993), pp. 239–244.
- [3359] K. R. UMASHANKAR, S. NIMMAGADDA, AND A. TAFLOVE, *Numerical analysis of electromagnetic scattering by electrically large objects using spatial decomposition technique*, IEEE Trans. Antennas Propag., 40 (1992), pp. 867–877.
- [3360] K.-H. UNTIET, *Mehrgitterverfahren für eine Finite Element Approximation des Stokes-Problems*, PhD thesis, Abteilung für mathematik, Ruhr Universität Bochum, 1985.
- [3361] K. URBAN, *Using divergence free wavelets for the numerical solution of the Stokes problem*, in AMLI’96: Proceedings of the Conference on Algebraic Multilevel Iteration Methods with Applications, vol. 2, Nijmegan, The Netherlands, 1996, University of Nijmegan, pp. 261–277.
- [3362] A. URESIN AND M. DUBOIS, *Sufficient conditions for the convergence of asynchronous iterations*, Parallel Comput., 10 (1989), pp. 83–92.
- [3363] J. W. VAN DER BURG, J. G. M. KUERTEN, AND P. J. ZANDBERGEN, *Multigrid and Runge-Kutta time stepping with frozen dissipation applied to the total variation diminishing Roe-Sweby scheme*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 2, Denver, 1991, University of Colorado, pp. 173–178.
- [3364] H. T. M. VAN DER MAAREL, P. W. HEMKER, B. KOREN, AND J. A. MICHELSSEN, *Application of a solution-adaptive multigrid method to the Euler equations*, CWI Quarterly, 6 (1993), pp. 49–75.
- [3365] H. T. M. VAN DER MAAREL AND B. KOREN, *Spurious, zeroth-order entropy generation along a kinked wall*, Int. J. Numer. Meth. Fluids, 13 (1991), pp. 1113–1129.
- [3366] H. T. M. VAN DER MAAREL AND A. W. PLATSCHORRE, *Optimization of flexible coupling in domain decomposition for a system of PDEs*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 566–574.
- [3367] A. J. VAN DER WEES, *Impact of multigrid smoothing analysis of three- dimensional potential flow calculations*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 3, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 141–162.
- [3368] R. F. VAN DER WINJNGAART, *Efficient implementation of a 3-dimensional ADI method on the iPSC/860*, in Proceedings of the Supercomputing Conference 1993, Los Alamitos, 1993, IEEE, Computer Society Press, pp. 102–111.
- [3369] D. VANDERSTRAETEN, *An accurate parallel block Gram–Schmidt algorithm without reorthogonalization*, Numer. Lin. Alg. Appl., 7 (2000), pp. 219–236.
- [3370] D. VANDERSTRAETEN AND R. KEUNINGS, *Optimized partitioning of unstructured finite element meshes*, Int. J. Numer. Meth. Engng, 38 (1995), pp. 433–450.
- [3371] D. VANDERSTRAETEN, R. KEUNINGS, AND C. FARHAT, *Optimization of mesh partitions and impact on parallel CFD*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North-Holland), Amsterdam, 1995, pp. 233–239.
- [3372] S. VANDEWALLE, *Waveform relaxation methods for solving parabolic partial differential equations*, in Proceedings of the Fifth Distributed Memory Computing Conference, Los Alamitos, CA, 1990, IEEE, pp. 575–584.
- [3373] ———, *The Parallel Solution of Parabolic Partial Differential Equations by Multigrid Waveform Relaxation Methods*, PhD thesis, Katholieke Universiteit Leuven, Leuven, Belgium, 1992.
- [3374] ———, *Parallel Multigrid Waveform Relaxation for Parabolic Problems*, B. G. Teubner

- Verlag, Stuttgart, 1993.
- [3375] S. VANDEWALLE, J. DEKEYSER, AND R. PISSSENS, *The numerical solution of elliptic partial differential equations on a hypercube multiprocessor*, in Scientific Computing on Supercomputers, New York, 1989, Plenum Press, pp. 69–97.
- [3376] S. VANDEWALLE, R. DRIESSCHE, AND R. PISSSENS, *The implementation of parabolic partial differential equation solvers on a hypercube multiprocessor*, in Parallel Computing 89, Amsterdam, 1990, North Holland, pp. 61–66.
- [3377] ———, *The parallel performance of standard parabolic marching schemes*, Int. J. High Speed Computing, 3 (1991), pp. 1–29.
- [3378] S. VANDEWALLE AND G. HORTON, *Multicomputer-multigrid solution of parabolic partial differential equations*, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 97–109.
- [3379] ———, *Fourier mode analysis of the multigrid waveform relaxation and time parallel multigrid methods*, Comput., 54 (1995), pp. 317–330.
- [3380] S. VANDEWALLE AND R. PISSSENS, *A comparison of parallel multigrid strategies*, in Hypercube and Distributed Computers, Amsterdam, 1989, North Holland, pp. 65–79.
- [3381] ———, *A comparison of the Crank–Nicolson and waveform relaxation multigrid methods on the Intel hypercube*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 417–434.
- [3382] ———, *A parallel and vectorizable algorithm for solving parabolic partial differential equations*, in Parallel Algorithms for PDEs, W. Hackbusch, ed., Wiesbaden, 1990, Vieweg Verlag, pp. 216–227.
- [3383] ———, *Multigrid waveform relaxation for solving parabolic partial differential equations*, in Multigrid Methods III, W. Hackbusch and U. Trottenberg, eds., vol. 98 of International Series of Numerical Mathematics, Basel, 1991, Birkhäuser, pp. 377–388.
- [3384] ———, *Numerical experiments with nonlinear multigrid waveform relaxation on a parallel processor*, Appl. Numer. Math., 8 (1991), pp. 149–161.
- [3385] ———, *On dynamic iteration methods for solving time-periodic differential equations*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 2, Denver, 1991, University of Colorado, pp. 357–375.
- [3386] ———, *Efficient parallel algorithms for solving initial-boundary value and time-periodic parabolic partial differential equations*, SIAM J. Sci. Stat. Comput., 13 (1992), pp. 1330–1346.
- [3387] ———, *On dynamic iteration methods for solving time-periodic differential equations*, SIAM J. Numer. Anal., 30 (1993), pp. 286–303.
- [3388] S. VANDEWALLE AND D. ROOSE, *The parallel waveform relaxation multigrid method*, in Parallel Processing for Scientific Computing, G. Rodrigue, ed., SIAM, Philadelphia, 1989, pp. 152–156.
- [3389] S. VANDEWALLE, D. ROOSE, AND R. PISSSENS, *A comparison of two parallel multigrid methods for the numerical solution of parabolic partial differential equations*, in Proceedings of the Fourth Conference on Hypercubes, Concurrent Computers and Applications, Los Altos, CA, 1990, Golden Gate Enterprises, pp. 1287–1290.
- [3390] S. VANDEWALLE AND E. VELDE, *Space-time concurrent multigrid waveform relaxation*, Annals of Num. Math., 1 (1994), pp. 347–363.
- [3391] P. VANĚK, *Acceleration of convergence of a two level algorithm by smoothing transfer operators*, Appl. Math., 37 (1992), pp. 265–274.
- [3392] ———, *Fast multigrid solver*, Appl. Math., 40 (1995), pp. 1–20.
- [3393] P. VANĚK AND S. GHOSAL, *A new technique for construction of image pyramids*, Asian Conference on Computer Vision, 1 (1996), pp. 479–483.
- [3394] P. VANĚK, J. MANDEL, AND M. BREZINA, *Algebraic multigrid based on smoothed aggregation for second and fourth order problems*, Computing, 56 (1996), pp. 179–196.
- [3395] ———, *Algebraic multigrid by smoothed aggregation for second and fourth order elliptic problems*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 721–735.
- [3396] P. VANĚK, R. TEZAUR, M. BREZINA, AND J. KIZKOVA, *Two-level method with coarse space size independent convergence*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 233–240.

- [3397] S. P. VANKA, *Block implicit multigrid calculation of three dimensional recirculating flows*, in Proc. Internat. Conference on Numerical Method in Laminar and Turbulent Flow, Swansea, U.K., 1985.
- [3398] ———, *Block-implicit multigrid solution of Navier-Stokes equations in primitive variables*, J. Comput. Phys., 65 (1986), pp. 138–158.
- [3399] ———, *Fast numerical computation of viscous flow in a cube*, Numer. Heat Transfer B, Fundam., 20 (1991), pp. 255–261.
- [3400] R. S. VARGA, *Matrix Iterative Analysis*, Prentice-Hall, Englewood Cliffs, NJ, 1962.
- [3401] P. VASHISHTA, R. K. KALIA, S. W. DE LEEUW, D. L. GREENWELL, A. NAKANO, W. JIN, J. YU, L. BI, AND W. LI, *Computer simulation of materials using parallel architectures*, Computational Materials Sci., 2 (1994), pp. 180–208.
- [3402] A. VASILESCU, *Cyclic symmetry in geometrical nonlinear analysis of structures*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 843–849.
- [3403] X. VASSEUR, *Analysis of a non-standard multigrid preconditioner by spectral portrait computation*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 249–255.
- [3404] P. S. VASSILEVSKI, *Multigrid method in subspace and domain partitioning in the discrete solution of elliptic problems*, in Multigrid Methods II, W. Hackbusch and U. Trottenberg, eds., Berlin, 1986, Springer-Verlag, pp. 301–314.
- [3405] ———, *Multilevel preconditioning matrices and multigrid V-cycle methods*, in Robust Multi-Grid Methods, W. Hackbusch, ed., vol. 23 of Notes on Numerical Fluid Mechanics, Braunschweig, 1989, Vieweg, pp. 200–208.
- [3406] ———, *Hybrid V-cycle algebraic multilevel preconditioners*, Math. Comp., 58 (1992), pp. 489–512.
- [3407] ———, *A block-factorization (algebraic) formulation of multigrid and Schwarz methods*, E.-W. J. Numer. Math., 6 (1998), pp. 65–79.
- [3408] P. S. VASSILEVSKI, S. I. PETROVA, AND R. D. LAZAROV, *Finite difference schemes on triangular cell-centered grids with local refinement*, SIAM J. Sci. Stat. Comput., 13 (1992), pp. 1287–1313.
- [3409] P. S. VASSILEVSKI AND J. G. WADE, *A comparison of multilevel methods for total variation regularization*, Electr. Trans. Numer. Anal., 6 (1997), pp. 255–256.
- [3410] V. N. VATSA, M. SANETRIK, AND E. PARLETTE, *Development of a flexible and efficient multigrid-based multiblock flow solver*, AIAA, 93-0677 (1993).
- [3411] V. N. VATSA, J. L. THOMAS, AND B. W. WEDAN, *Navier-Stokes computations of prolate spheroids at angle of attack*, AIAA, 87-2627-CP (1987).
- [3412] V. N. VATSA, E. TURKEL, AND J. S. ABOLHASSANI, *Extension of multigrid methodology to supersonic/hypersonic 3-d viscous flows*, Int. J. Numer. Meth. Fluids, 17 (1993), pp. 825–837.
- [3413] V. N. VATSA AND B. W. WEDAN, *Development of an efficient multigrid code for 3-D Navier-Stokes equations*, AIAA, 89-1791 (1989).
- [3414] ———, *Development of a multigrid code for 3-D Navier-Stokes equations and its application to a grid-refinement study*, Comput. Fluids, 18 (1990), pp. 391–403.
- [3415] E. V. VELDE, *Concurrent Scientific Computing*, vol. 16 of Texts in Applied Mathematics, Springer-Verlag, New York, 1994.
- [3416] E. V. VELDE AND H. B. KELLER, *The design of a parallel multigrid algorithm*, in Proceedings of the Second International Conference on Supercomputing, L. Kartashev, ed., 1987, pp. 76–83.
- [3417] R. G. VENKATA, J. OLIGER, AND J. FERZIGER, *Composite grids for flow computations on complex 3D domains*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 605–613.
- [3418] V. VENKATAKRISHNAN AND D. J. MAVRIPLIS, *Agglomeration multigrid for the three-dimensional Euler equations*, AIAA J., 33 (1995), pp. 633–640.
- [3419] V. VENKATAKRISHNAN, D. J. MAVRIPLIS, AND M. J. BERGER, *Unstructured multigrid through agglomeration*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 649–662.
- [3420] C. H. VENNER, *Multilevel Solution of the EHL Line and Point Contact Problems*, PhD thesis, University of Twente, Enschede, The Netherlands, 1991.
- [3421] C. H. VENNER AND A. A. LUBRECHT, *Multilevel solution of integral and integro-differential equations in contact mechanics and lubrication*, in Multigrid Methods IV, Proceedings

- of the Fourth European Multigrid Conference, Amsterdam, July 6-9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 111–127.
- [3422] C. H. VENNER AND W. E. T. NAPEL, *Multilevel solution of the elastohydrodynamically lubricated circular contact problem. Part I: Theory and numerical algorithm*, Wear, 152 (1992), pp. 351–367.
- [3423] M. VERBEEK, *Repairing near-singularity for dense EMC problems by adaptive basis techniques*, Numer. Lin. Alg. Appl., 7 (2000).
- [3424] G. K. VERBOOM AND A. SEGAL, *Weakly-reflective boundary conditions for shallow water equations*, in Research in Numerical Fluid Mechanics, P. Wesseling, ed., vol. 17 of Notes on Numerical Fluid Mechanics, Braunschweig, 1987, Vieweg, pp. 115–129.
- [3425] R. VERFÜRTH, *Two algorithms for mixed problems*, in Preliminary Proc. for Internat. Multigrid Conference, Ft. Collins, CO, 1983, Institute for Computational Studies at Colorado State University.
- [3426] ———, *A combined conjugate gradient-multigrid algorithm for the numerical solution of the Stokes problem*, IMA J. Numer. Anal., 4 (1984), pp. 441–455.
- [3427] ———, *The contraction number of a multigrid method with mesh ratio 2 for solving Poisson's equation*, J. Lin. Alg. Applic., 60 (1984), pp. 332–348.
- [3428] ———, *A multilevel algorithm for mixed problems*, SIAM J. Numer. Anal., 21 (1984), pp. 264–271.
- [3429] ———, *Numerical solution of mixed finite element problems*, in Efficient Solution of Elliptic Systems, W. Hackbusch, ed., vol. 10 of Notes on Numerical Fluid Mechanics, Braunschweig, 1984, Vieweg, pp. 132–144.
- [3430] ———, *A preconditioned conjugate residual algorithm for the Stokes problem*, in Advances in Multi-Grid Methods, D. Braess, W. Hackbusch, and U. Trottenberg, eds., vol. 11 of Notes on Numerical Fluid Mechanics, Braunschweig, 1984, Vieweg, pp. 112–118.
- [3431] ———, *Multi-level algorithms for mixed problems II. Treatment of the mini-element*, SIAM J. Numer. Anal., 25 (1988), pp. 285–293.
- [3432] ———, *A posteriori error estimates for the Stokes equations II non-conforming discretizations*, Numer. Math., 60 (1991), pp. 235–249.
- [3433] ———, *A Review of A Posteriori Error Estimation and Adaptive Mesh-Refinement Techniques*, Wiley Teubner, New York, Stuttgart, 1996. ISBN 0-471-96795-5.
- [3434] T. VERHUVEN, *Numerische Behandlung von Template-Matching in der automatischen Bildverarbeitung*, PhD thesis, Institut für Angewandte Mathematik, Universität Bonn, 1984.
- [3435] J. C. VINK, *Multigrid inversion of staggered and Wilson fermion operators with SU(2) gauge fields in two dimensions*, Phys. Lett. B, 272 (1991), pp. 81–85.
- [3436] ———, *Multigrid inversion of fermion operators with SU(2) gauge fields in two and four dimensions*, Nucl. Phys. B, Proc. Suppl., 26B (1992), pp. 607–609.
- [3437] J. S. VOLK, *Analysis of multigrid techniques for system modeling with toeplitz approximation*, master's thesis, Naval Postgraduate School, Monterey, CA, 1994.
- [3438] R. L. VOLLER, *Monotone including multigrid-method*, Computing, 45 (1991), pp. 377–382.
- [3439] H. A. VORST AND T. F. CHAN, *Parallel preconditioning for sparse linear equations*, ZAMM, 76 (1996), pp. 167–170.
- [3440] M. H. VOYTKO, *Comparison of the multigrid and ICCG methods in solving diffusion equations*, master's thesis, Lawrence Livermore National Laboratory, UC, Livermore, CA, 1984.
- [3441] L. VOZOVOI, M. ISRAELI, AND A. AVERBUCH, *Multi-domain Fourier algorithms for parallel solution of the Navier-Stokes equations*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 539–546.
- [3442] ———, *Spectral multidomain technique with local Fourier basis II: decomposition into cells*, J. Sci. Comput., 9 (1994), pp. 311–326.
- [3443] S. B. VRHOVAC, S. B. RADOVANOV, Z. L. PETROVIC, AND B. M. JELENKOVIC, *Electron energy distribution functions in weakly ionized argon*, J. Phys. D Appl. Phys., 25 (1992), pp. 217–225.
- [3444] C. VUIK, P. WESSELING, AND S. ZENG, *Krylov subspace and multigrid methods applied to the incompressible Navier-Stokes equations*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 737–753.
- [3445] V. VYAS, *Real space renormalization group approach to the multigrid method*, Phys. Rev. D, Part. Fields, 43 (1991), pp. 3465–3474.
- [3446] ———, *Calculating the quark propagators using the Migdal-Kadanoff transformation*, in

- Workshop on Fermion Algorithms, HLRZ, KFA Jülich, Germany, 1991, H. J. Herrmann and F. Karsch, eds., Singapore, 1992, World Scientific, pp. 169–172.
- [3447] ———, *An efficient algorithm for calculating the quark propagators using Migdal Kadanoff transformation*, Phys. Lett. B, 308 (1993), pp. 334–339.
- [3448] E. L. WACHPRESS, *Split-level iteration*, Comput. Math. Appl., 10 (1984).
- [3449] E. L. WACHPRESS, *The ADI Model Problem*, Wachpress, Windsor, CA, 1995.
- [3450] C. WAGNER, *On the algebraic construction of multilevel transfer operators (for convection-diffusion-reaction equations)*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 264–270.
- [3451] C. WAGNER AND G. WITTUM, *Filtering decompositions with respect to adaptive test vectors*, in Multigrid Methods V, vol. 3 of Lecture Notes in Computational Science and Engineering, Berlin, 1998, Springer, pp. 320–334.
- [3452] C. WALSHAW AND M. BERZINS, *Adaptive time-dependent CFD on distributed unstructured meshes*, in Parallel Computational Fluid Dynamics, Elsevier Science Publishers B.V. (North-Holland), Amsterdam, 1995, pp. 191–198.
- [3453] C. WALSHAW, M. CROSS, AND M. G. EVERETT, *Parallel unstructured mesh partitioning*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 647–654.
- [3454] R. W. WALTERS, T. REU, W. D. MCGRORY, J. L. THOMAS, AND P. F. RICHARDSON, *A longitudinally-patched grid approach with applications to high speed flows*, AIAA, 88–0715 (1988).
- [3455] R. W. WALTERS AND J. L. THOMAS, *A patched-grid algorithm for complex aircraft configurations*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1990, SIAM, pp. 397–409.
- [3456] R. W. WALTERS, J. L. THOMAS, AND G. F. SWITZER, *Aspects and applications of patched grid calculations*, AIAA, 86–1063 (1986).
- [3457] W. L. WAN, *Interface preserving coarsening multigrid for elliptic problems with highly discontinuous coefficients*, Numer. Lin. Alg. Appl., 7 (2000), pp. 727–741.
- [3458] F. J. WANG AND G. A. DOMOTO, *Free surface Taylor vortices*, J. Fluid Mech., 261 (1994), pp. 169–198.
- [3459] G. WANG, *On the use of orthogonal wavelets on the interval in the moment method EM scattering*, Microw. Opt. Technol. Lett., 11 (1996), pp. 10–13.
- [3460] G. WANG, J. ZHANG, AND G. W. PAN, *Solution of inverse problems in image processing by wavelet expansion*, IEEE Trans. Image Process., 4 (1995), pp. 579–593.
- [3461] H. WANG, H. K. DAHLE, R. E. EWING, T. LIN, AND J. E. V/OAG, *ELLAM-based domain decomposition and local refinement techniques for advection-diffusion equations with interfaces*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 361–366.
- [3462] H. WANG AND B. G. ERSLAND, *A characteristic domain decomposition algorithm for two-phase flows with interfaces*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 835–842.
- [3463] H. WANG, T. LIN, AND R. E. EWING, *ELLAM with domain decomposition and local refinement techniques for advection-reaction problems with discontinuous coefficients*, in Computational Methods in Water Resources IX, vol. 1, Computational Mechanics Publications and Elsevier Applied Science, London, 1992, pp. 17–24.
- [3464] H. WANG, J. E. VAG, AND M. S. ESPEDAL, *A characteristic-based domain decomposition and space-time local refinement method for advection-reaction equations with interfaces*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 325–332.
- [3465] H. Y. WANG AND J. B. SAULNIER, *Extension of multigrid technique to the analysis of conjugate heat transfer*, in Institution of Chemical Engineers Symposium Series, vol. 2, Inst of Chemical Engineers, Rugby, Engl., 1992, pp. 947–956.
- [3466] ———, *A sensitivity study of material properties for coupled convective conductive heat transfer generated in an electronic equipment*, Int. J. Heat Mass Transf., 36 (1993), pp. 3831–3839.
- [3467] J. WANG, *Convergence analysis of multigrid algorithms for non-selfadjoint and indefinite elliptic problems*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 2, Denver,

- 1991, University of Colorado, pp. 345–356.
- [3468] ———, *Convergence analysis of Schwartz algorithm and multilevel decomposition iterative methods I: Selfadjoint and positive definite elliptic problems*, in Proc. International Conference on Iterative Methods in Linear Algebra, 1991.
- [3469] ———, *Convergence analysis without regularity assumptions for multigrid algorithms based on SOR smoothing*, SIAM J. Numer. Anal., 29 (1992), pp. 987–1001.
- [3470] ———, *Convergence analysis of multigrid algorithms for nonselfadjoint and indefinite elliptic problems*, SIAM J. Numer. Anal., 30 (1993), pp. 275–285.
- [3471] ———, *Convergence analysis of Schwartz algorithm and multilevel decomposition iterative methods II: Non-selfadjoint and positive indefinite elliptic problems*, SIAM J. Numer. Anal., 30 (1993), pp. 953–970.
- [3472] J. WANG, H. LUNG, Y. KATSUMATA, AND T. ISHIGAI, *Implementing a 3D multigrid algorithm on Fujitsu’s vector parallel supercomputer*, in The First Aizu International Symposium on Parallel Algorithms/Architecture Synthesis 1995, Los Alamitos, CA, 1995, IEEE Comput. Soc. Press, pp. 107–113.
- [3473] J. WANG AND N. YAN, *A parallel domain decomposition procedure for convection diffusion problems*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 333–339.
- [3474] J. C. H. WANG, H. LUNG, Y. KATSUMATA, AND T. ISHIGAI, *Using domain decomposition in the multigrid NAS parallel benchmark on the Fujitsu VP500*, in Parallel Processing for Scientific Computing, SIAM Proceedings, Philadelphia, 1995, SIAM, pp. 397–398.
- [3475] K. P. WANG AND J. C. BRUCH, *Highly efficient iterative parallel computational method for finite element systems*, Eng. Comput., 10 (1993), pp. 195–204.
- [3476] ———, *Studies of an interface relaxation domain decomposition technique using finite elements on a parallel computer*, Numer. Meth. for PDE, 9 (1993), pp. 372–393.
- [3477] M. WANG AND S. P. VANKA, *Parallel ADI algorithm for high-order finite-difference solution of the unsteady heat conduction equation, and its implementation on the CM-5*, Numer. Heat Transf. B, Fundam., 24 (1993), pp. 143–159.
- [3478] P. WANG AND P. G. DANIELS, *Numerical solutions for the flow near the end of a shallow laterally heated cavity*, J. Eng. Math., 28 (1994), pp. 211–226.
- [3479] ———, *Numerical study of thermal convection in shallow cavities with conducting boundaries*, Int. J. Heat Mass Transf., 37 (1994), pp. 387–399.
- [3480] K. WARENDORF, U. KÜSTER, AND R. RÜHLE, *Multilevel methods for a highly unstructured Euler solver*, in Proceedings of the Fourth European Computational Fluid Dynamics Conference, K. D. Papailiou, D. Tsahalis, J. Périaux, C. Hirsch, and M. Pandolfi, eds., vol. 1, Athens, Greece, 1998, J. Wiley & Sons, pp. 1252–1257.
- [3481] ———, *Upwind prolongations for a highly-unstructured Euler solver*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 271–277.
- [3482] L. C. WARING, N. ROONEY, A. STEWART, AND V. F. FUSCO, *The parallel computation of solutions to electrostatic problems using multigrid techniques*, Int. J. Numer. Model., Electron. Netw. Devices Fields, 7 (1994), pp. 69–74.
- [3483] G. P. WARREN, *Application of multigrid and adaptive grid embedding to the two-dimensional flux-split Euler equations*, Comm. Appl. Num. Methods, 8 (1992), pp. 771–784.
- [3484] G. P. WARREN AND T. W. ROBERTS, *Multigrid properties of upwind-biased data reconstruction*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 663–677.
- [3485] T. WASHIO AND C. W. OOSTERLEE, *Krylov subspace acceleration for nonlinear multigrid schemes*, Elect. Trans. Numer. Anal., 6 (1997), pp. 271–290.
- [3486] T. WASHIO AND K. OOSTERLEE, *Krylov subspace acceleration for nonlinear multigrid schemes*, in 5th European Multigrid Conference Special Topics and Applications, University of Stuttgart, Stuttgart, 1998, pp. 125–137.
- [3487] A. J. WATHEN, *Realistic eigenvalue bounds for the Galerkin mass matrix*, IMA J. Numer. Anal., 7 (1987), pp. 449–457.
- [3488] ———, *Spectral bounds and preconditioning methods using element-by-element analysis for Galerkin finite element equations*, in The Mathematics of Finite Elements and Applications, VI, Academic Press, New York, 1988, pp. 157–168.
- [3489] H. WEBER, *A singular multi-grid iteration method for bifurcation problems*, in Numerical Methods of Bifurcation Problems, T. Küpper, H. D. Mittelmann, and H. Weber, eds., Birkhäuser-Verlag, Basel, 1984.

- [3490] ———, *A multigrid method for a petrov galerkin discretization of the Stokes equations*, Numer. Math., 66 (1993), pp. 525–541.
- [3491] R. WEBSTER, *An algebraic multigrid solver for Navier–Stokes problems*, Int. J. Numer. Meth. Fluids, 18 (1994), pp. 761–780.
- [3492] ———, *An algebraic multigrid solver for Navier–Stokes problems in the discrete second-order approximation*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 755–770.
- [3493] A. J. WEES, *FAS multigrid employing ILU/SIP smoothing: A robust fast solver for 3D transonic potential flow*, in Multigrid Methods II, W. Hackbusch and U. Trottenberg, eds., Berlin, 1986, Springer–Verlag, pp. 315–331.
- [3494] ———, *A Nonlinear Multigrid Method for Three-Dimensional Transonic Potential Flow*, PhD thesis, Tech. Univ. Delft, Delft, 1988.
- [3495] ———, *Impact of multigrid smoothing analysis on three-dimensional potential flow calculations*, in Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods, J. Mandel, S. F. McCormick, J. E. Dendy, C. Farhat, G. Lonsdale, S. V. Parter, J. W. Ruge, and K. Stüben, eds., Philadelphia, 1989, SIAM, pp. 399–416.
- [3496] M. F. WEHNER, A. J. BOURGEOIS, P. G. ELTGROTH, P. B. DUFFY, AND W. P. DANNEVIK, *A parallel coupled oceanic atmospheric general circulation model*, in Proceedings of the Sixth ECMWF Workshop on the Use of Parallel Processors in Meteorology, Reading, UK, Nov. 21–25, 1994, Singapore, 1995, World Scientific, pp. 512–522.
- [3497] M. F. WEHNER, A. A. MIRIN, P. G. ELTGROTH, W. P. DANNEVIK, C. R. MECHOSO, J. D. FARRARA, AND J. A. SPAHR, *Performance of a distributed memory finite difference atmospheric general circulation model*, Parallel Comput., 21 (1995), pp. 1655–1675.
- [3498] L. WEI AND F. DUFAUX, *Image sequence coding by multigrid motion estimation and segmentation based coding of prediction errors*, in Proc. SPIE - Int. Soc. Opt. Eng., vol. 2094, 1993, pp. 542–552.
- [3499] P. WEIDNER AND B. STEFFEN, *Vektorisierung von Mehrgitterverfahren: Tests auf einer Cray X-MP*, in Rechnerarchitekturen für die numerische Simulation auf der Basis superschneller Lösungsverfahren I, U. Trottenberg and P. Wypior, eds., GMD-Studien Nr. 88, Gesellschaft für Mathematik und Datenverarbeitung, St. Augustin, 1984, pp. 195–198.
- [3500] R. WEIL, *An extension of the Munkres algorithm for the assignment problem to rectangular matrices*, Comm. of the ACM, 14 (1971), pp. 802–804.
- [3501] A. WEISER AND M. F. WHEELER, *On convergence of block-centered finite differences for elliptic problems*, SIAM J. Numer. Anal., 25 (1988), pp. 351–375.
- [3502] R. WEISS, *Minimization properties and short recurrences for Krylov subspace methods*, Elect. Trans. Numer. Anal., 2 (1994), pp. 57–75.
- [3503] J. B. WEISSMAN AND A. S. GRIMSHAW, *Network partitioning of data parallel computations*, in Proceedings of the 3rd IEEE International Symposium on High Performance Distributed Computing, Los Alamitos, CA, 1994, IEEE Comput. Soc. Press, pp. 149–156.
- [3504] W. L. WENDLAND, *On some mathematical aspects of boundary element methods for elliptic problems*, in The Mathematics of Finite Elements and Applications, J. R. Whiteman, ed., vol. 5, London, 1985, pp. 193–227.
- [3505] ———, *Boundary element methods for elliptic problems*, in Mathematical Theory of Finite and Boundary Element Methods, A. H. Schatz, V. Thomée, and W. L. Wendland, eds., DMV Seminar Band 15, Birkhäuser Verlag, Basel, Boston, Berlin, 1990, pp. 219–276.
- [3506] W. L. WENDLAND, E. STEPHAN, AND G. C. HSIAO, *On the integral equation method for the plane mixed boundary value problem of the Laplacean*, Math. Meth. Appl. Sci., 1 (1979), pp. 265–321.
- [3507] P. WESSELING, *The rate of convergence of a multiple grid method*, in Numerical Analysis, G. A. Watson, ed., vol. 773 of Lecture Notes in Mathematics, Berlin, 1980, Springer–Verlag, pp. 164–184.
- [3508] ———, *A robust and efficient multigrid method*, in Multigrid Methods, W. Hackbusch and U. Trottenberg, eds., vol. 960 of Lecture Notes in Mathematics, Springer–Verlag, Berlin, 1982, pp. 614–630.
- [3509] ———, *Theoretical and practical aspects of a multigrid method*, SIAM J. Sci. Stat. Comput., 3 (1982), pp. 387–407.
- [3510] ———, *Multigrid solution of the Navier–Stokes equations in the vorticity–streamfunction formulation*, in Efficient Solution of Elliptic Systems, W. Hackbusch, ed., vol. 10 of Notes on Numerical Fluid Mechanics, Braunschweig, 1984, Vieweg, pp. 145–154.
- [3511] ———, *Linear multigrid methods*, in Multigrid Methods, S. F. McCormick, ed., vol. 3 of

- Frontiers in Applied Mathematics, SIAM, Philadelphia, 1987, pp. 31–55.
- [3512] ———, *Research in Numerical Fluid Mechanics*, vol. 17 of Notes on Numerical Fluid Mechanics, Vieweg, Braunschweig, 1987.
- [3513] ———, *Cell-centered multigrid for interface problems*, J. Comput. Phys., 79 (1988), pp. 85–91.
- [3514] ———, *Cell-centered multigrid for interface problems*, in Multigrid Methods: Theory, Applications, and Supercomputing, S. F. McCormick, ed., vol. 110 of Lecture Notes in Pure and Applied Mathematics, Marcel Dekker, New York, 1988, pp. 631–641.
- [3515] ———, *A multigrid method for elliptic equations with a discontinuous coefficient*, in Proceedings of the First International Conference on Industrial and Applied Mathematics (ICIAM 87), A. H. P. Burgh and R. M. M. Mattheij, eds., SIAM, Philadelphia, 1988, pp. 173–183.
- [3516] ———, *Two remarks on multigrid methods*, in Robust Multi-Grid Methods, W. Hackbusch, ed., vol. 23 of Notes on Numerical Fluid Mechanics, Vieweg, Braunschweig, 1989, pp. 209–216.
- [3517] ———, *Multigrid methods in computational fluid dynamics*, Z. Angew. Math. Mech., 70 (1990), pp. 337–348.
- [3518] ———, *Large scale modeling in computational fluid dynamics*, in Algorithms and Parallel VLSI Architectures, vol. A: Tutorials, Elsevier, Amsterdam, 1991, pp. 277–306.
- [3519] ———, *A survey of fourier smoothing analysis results*, in Multigrid Methods III, vol. 98 of International Series of Numerical Mathematics, Birkhäuser, Basel, 1991, pp. 105–127.
- [3520] ———, *An Introduction to Multigrid Methods*, John Wiley & Sons, Chichester, 1992. Reprinted by www.MGNet.org.
- [3521] ———, *The role of incomplete LU-factorization in multigrid methods*, in Incomplete Decompositions (ILU) – Algorithms, Theory, and Applications, vol. 41 of Notes on Numerical Fluid Mechanics, Vieweg, Braunschweig, 1993, pp. 202–214.
- [3522] ———, *An Introduction to Multigrid Methods*, <http://www.MGNet.org>, Cos Cob, CT, 2001. Reprint of the 1992 edition.
- [3523] P. WESSELING, A. SEGAL, J. J. I. M. KAN, C. W. OOSTERLEE, AND C. G. M. KASSELS, *Finite volume discretization of the incompressible Navier-Stokes equations in general coordinates on staggered grids*, Comp. Fluid Dyn. J., 1 (1992), pp. 27–33.
- [3524] P. WESSELING AND P. SONNEVELD, *Numerical experiments with a multiple grid and a preconditioned Lanczos type method*, in Approximation Methods for Navier-Stokes Problems, R. Rautmann, ed., vol. 771 of Lecture Notes in Mathematics, Springer-Verlag, Berlin, 1980, pp. 543–562.
- [3525] D. H. WEST, *Approximate solution of the quadratic assignment problem*, ACM Trans. Math. Soft., 9 (1983), pp. 461–466.
- [3526] C. V. WESTENHOLZ, *Differential Forms in Mathematical Physics*, North-Holland, Amsterdam, 1978.
- [3527] S. R. WHITE, J. W. WILKINS, AND M. P. TETER, *Finite-element method for electronic structure*, Phys. Rev. B, 39 (1989), pp. 5819–5833.
- [3528] G. B. WHITHAM, *Linear and Nonlinear Waves*, John Wiley & Sons, New York, 1974.
- [3529] O. B. WIDLUND, *Iterative methods for elliptic problems on regions partitioned into substructures and the biharmonic Dirichlet problem*, in Computing Methods in Applied Sciences and Engineering, R. Glowinski and J.-L. Lions, eds., vol. VI, North-Holland, Amsterdam, New York, Oxford, 1984, pp. 33–45.
- [3530] ———, *An extension theorem for finite element spaces with three applications*, in Numerical Techniques in Continuum Mechanics, W. Hackbusch and K. Witsch, eds., vol. 16 of Notes on Numerical Fluid Mechanics, Vieweg, Braunschweig, 1987, pp. 110–122.
- [3531] ———, *Iterative substructuring methods: algorithms and theory for elliptic problems in the plane*, in First International Symposium on Domain Decomposition Methods for Partial Differential Equations, R. Glowinski, G. H. Golub, G. A. Meurant, and J. Périaux, eds., Philadelphia, 1988, SIAM, pp. 113–128.
- [3532] ———, *Iterative solution of elliptic finite element problems on locally refined meshes*, in Finite Element Analysis in Fluids, T. J. Chung and G. R. Karr, eds., Huntsville, AL, 1989, University of Alabama in Huntsville Press, pp. 462–467.
- [3533] ———, *Optimal iterative refinement methods*, in Domain Decomposition Methods, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1989, SIAM, pp. 114–125.
- [3534] ———, *Some domain decomposition and iterative refinement algorithms for elliptic finite element problems*, J. Comput. Math., 7 (1989), pp. 200–208.
- [3535] ———, *Some Schwarz methods for symmetric and nonsymmetric elliptic problems*, in Fifth

- International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 19–36.
- [3536] ———, *Exotic coarse spaces for Schwarz methods for lower order and spectral finite elements*, in Domain Decomposition Methods in Scientific and Engineering Computing: Proceedings of the Seventh International Conference on Domain Decomposition, vol. 180 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 131–138.
- [3537] ———, *Preconditioners for spectral and mortar finite element methods*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 19–32.
- [3538] A. WIEDERMANN AND J. IWAMOTO, *Multigrid TVD-type scheme for computing inviscid and viscous flows*, Comput. Fluids, 23 (1994), pp. 711–735.
- [3539] R. WIENANDS AND C. W. OOSTERLEE, *Fourier analysis for Krylov subspace acceleration of multigrid with application to 3D anisotropic problems*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer-Verlag, pp. 278–284.
- [3540] C. WIGGINS AND M. SPIEGELMAN, *Magma migration and magmatic solitary waves in 3-D*, Geophys. Res. Lett., 22 (1995), pp. 1289–1292.
- [3541] L. B. WIGTON, N. J. YU, AND D. P. YOUNG, *GMRES acceleration of computational fluid dynamics codes*, in Proceedings of the AIAA 7th Computational Fluid Dynamics Conference, Washington, DC, 1985, AIAA, pp. 85–1494.
- [3542] P. WILDERS AND G. FOTIA, *One-level Krylov-Schwarz domain decomposition for finite volume advection-diffusion*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 558–565.
- [3543] T. J. WILLIAMS, *3D gyrokinetic particle in cell simulation of fusion plasma microturbulence on parallel computers*, in High Performance Computing Symposium 1993. Grand Challenges in Computer Simulation. Proceedings of the 1993 Simulation Multiconference on the High Performance Computing Symposium 1993, 1993, pp. 114–119.
- [3544] F. WILLIEN, I. FAILLE, AND F. SCHNEIDER, *Domain decomposition methods applied to sedimentary basin modeling*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 736–744.
- [3545] F. WILLIEN, E. PIAULT, AND F.-X. ROUX, *Parallel preconditioners on MIMD computers applied to petroleum industry*, in Proceedings of International Conference on High Performance Computing and Networking. HPCN '95 Milan, Italy, May 3–5, 1995, Berlin, 1995, Springer-Verlag, pp. 287–292.
- [3546] R. V. WILSON, *On the prediction of multigrid efficiency through local mode analysis*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 679–689.
- [3547] G. WINTER, *Fourieranalyse zur Konstruktion schneller MGR-Verfahren*, PhD thesis, Institut für Angewandte mathematik, Universität Bonn, 1983.
- [3548] G. WITTUM, *Distributive Iterationen für Indefinite Systeme*, PhD thesis, Christian-Albrechts-Universität, Kiel, Germany, 1986.
- [3549] ———, *Linear iterations as smoothers in multi-grid methods*, Impact Comput. Sci. Eng., 1 (1989), pp. 180–215.
- [3550] ———, *Multi-grid methods for Stokes and Navier-Stokes equations—transforming smoothers: algorithms and numerical results*, Numer. Math., 54 (1989), pp. 543–563.
- [3551] ———, *On the robustness of ILU-smoothing*, SIAM J. Sci. Stat. Comput., 10 (1989), pp. 699–717.
- [3552] ———, *On the robustness of ILU-smoothing*, in Robust Multi-Grid Methods, W. Hackbusch, ed., vol. 23 of Notes on Numerical Fluid Mechanics, Braunschweig, 1989, Vieweg, pp. 217–239.
- [3553] ———, *On the convergence of multi-grid methods with transforming smoothers—theory with applications to the Navier-Stokes equations*, Numer. Math., 57 (1990), pp. 15–38.
- [3554] ———, *R-transforming smoothers for the incompressible Navier-Stokes equations*, in Proc. 5th GAMM-Seminar, W. Hackbusch, ed., vol. 30 of Notes on Numer. Fluid Mech., Braunschweig, 1990, Vieweg, pp. 153–162.
- [3555] ———, *The use of fast solvers in computational fluid dynamics*, in Proc. 8th GAMM-Donf. on Numer. Methods in Fluid Mech., Notes on Fluid Numer. Mech., vol. 29, Braunschweig, 1990, Vieweg, pp. 547–581.
- [3556] C. J. WOAN, *Euler solution of axisymmetric flows about bodies of revolution using a multi-*

- grid method*, AIAA, 85-0017 (1985).
- [3557] B. WOHLMUTH, *Adaptive Multilevel-Finite-Elemente Methode zur Lösung elliptischer Randwertprobleme*, PhD thesis, Technischen Universität München, Mathematisches Institut, 1995.
- [3558] B. I. WOHLMUTH, *A multigrid method for saddle point problems arising from mortar finite element discretizations*, Elect. Trans. Numer. Anal., 11 (2000), pp. 43–54.
- [3559] U. WOLFF, *Scaling topological charge in the CP^3 spin model*, Phys. Lett. B, 284 (1992), pp. 94–98.
- [3560] ———, *High precision simulation techniques for lattice field theory*, Int. J. Modern Phys. C (Phys. Comput.), 4 (1993), pp. 451–458.
- [3561] C. M. WOODS AND D. E. BREWE, *The solution of the Elrod algorithm for a dynamically loaded bearing using multigrid techniques*, J. Tribol. Trans. ASME, 111 (1989), pp. 302–308.
- [3562] P. H. WORLEY, *Information Requirements and the Implications for Parallel Computation*, PhD thesis, Stanford University, Department of Computer Science, Stanford, CA, 1989.
- [3563] N. G. WRIGHT AND P. H. GASKELL, *An efficient multigrid approach to solving highly recirculating flows*, Comput. Fluids, 24 (1995), pp. 63–79.
- [3564] G. WU AND Z. CHEN, *Numerical study of piston ring elastohydrodynamic lubrication by the multigrid method*, Tribol. Trans., 35 (1992), pp. 135–141.
- [3565] M.-Y. WU, *Solving Laplace equations on the connection machine*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1990, SIAM, pp. 385–394.
- [3566] J. Y. XIA AND C. TAYLOR, *Multigrid solution, based on the finite element method, for the Navier-Stokes equations*, Eng. Comput., 9 (1992), pp. 469–475.
- [3567] H. XIANG, D. M. BARRY, AND M. J. HOWES, *Fast simulation for semiconductor devices using multigrid method on a transputer based parallel machine*, in Transputer Applications and Systems'94. Proceedings of the 1994 World Transputer Congress, Amsterdam, Netherlands, 1994, IOS Press, pp. 974–981.
- [3568] J. L. XIAO AND A. D. SOKAL, *Rigorous lower bound on the dynamic critical exponent of some multilevel Swendsen Wang algorithms*, Phys. Rev. Lett., 67 (1991), pp. 1482–1485.
- [3569] S. XIAO AND D. M. YOUNG, *Multiple coarse grid multigrid methods for solving elliptic problems*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 771–791.
- [3570] D. XIE, *Nonlinear Multigrid Analysis for a Mildly Elliptic Nonlinear Boundary Value Problems*, PhD thesis, U. of Houston, Houston, 1995.
- [3571] ———, *New nonlinear multigrid analysis*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 793–808.
- [3572] G. XU AND F. SADEGHI, *Thermal EHL analysis of circular contacts with measured surface roughness*, in Proceedings of the 1995 Joint ASME/STLE Tribology Conference, New York, 1995, American Society of Mechanical Engineers, p. 10pp.
- [3573] ———, *Thermal EHL analysis of circular contacts with measured surface roughness*, Trans. ASME, J. Tribol., 118 (1996), pp. 473–483.
- [3574] J. XU, *Theory of Multilevel Methods*, PhD thesis, Cornell University, 1989.
- [3575] ———, *Convergence estimates for some multigrid algorithms*, in Third International Symposium on Domain Decomposition Methods for Partial Differential Equations, T. F. Chan, R. Glowinski, J. Périaux, and O. B. Widlund, eds., Philadelphia, 1990, SIAM, pp. 174–187.
- [3576] ———, *Counter examples concerning a weighted L^2 projection*, Math. Comp., 57 (1991), pp. 563–568.
- [3577] ———, *Iterative methods by space decomposition and subspace correction: A unifying approach*, SIAM Review, 34 (1992), pp. 581–613.
- [3578] ———, *Iterative methods by SPD and small subspace solvers for nonsymmetric or indefinite problems*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 106–118.
- [3579] ———, *New class of iterative methods for nonselfadjoint or indefinite problems*, SIAM J. Numer. Anal., 29 (1992), pp. 303–319.
- [3580] ———, *Some two-grid finite element methods*, in Domain Decomposition Methods in Science and Engineering: The Sixth International Conference on Domain Decomposition,

- vol. 157 of Contemporary Mathematics, Providence, Rhode Island, 1994, American Mathematical Society, pp. 79–87.
- [3581] ———, *The auxiliary space method and optimal multigrid preconditioning techniques for unstructured meshes*, Computing, 56 (1996), pp. 215–235.
- [3582] ———, *The EAFE scheme and CWDD method for convection-dominated problems*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997, DDM.org, pp. 618–625.
- [3583] J. XU AND J. QIN, *Some remarks on a multigrid preconditioner*, SIAM J. Sci. Comput., 15 (1994), pp. 172–184.
- [3584] X. J. XU AND M. Q. JIANG, *Parallel algorithms for a nonlinear monotone problem*, Math. Numer. Sin., 18 (1996), pp. 261–268.
- [3585] Y. XU, *Numerical Calculations of an Axisymmetric Laminar Diffusion Flame with Detailed and Reduced Reaction Mechanisms*, PhD thesis, Yale University, New Haven, 1991. Mechanical Engineering Department.
- [3586] Y. XU AND M. D. SMOOKE, *Application of a primitive variable Newton's method for the calculation of an axisymmetric laminar diffusion flame*, J. Comput. Phys., 104 (1993), pp. 99–109.
- [3587] ———, *Primitive variable modeling of multidimensional laminar flames*, Combust. Sci. and Tech., 88 (1993), pp. 1–25.
- [3588] Z. XU AND N. WANG, *Analysis of multigrid parallelization on message passing computers*, Wuhan U. J. Nat. Sci., 1 (1996), pp. 686–691.
- [3589] Y. YADLIN AND D. A. CAUGHEY, *Block multigrid implicit solution of the Euler equations of compressible fluid flow*, AIAA J., 29 (1991), pp. 712–719.
- [3590] ———, *Parallel computing strategies for block multigrid implicit solution of the Euler equations*, AIAA J., 30 (1992), pp. 2032–2038.
- [3591] G. YAGAWA AND R. SHIOYA, *Parallel finite elements on a massively parallel computer with domain decomposition*, Comput. Syst. Eng., 4 (1993), pp. 495–503.
- [3592] G. YAGAWA, A. YOSHIOKA, S. YOSHIMURA, AND N. SONEDA, *A parallel finite element method with a supercomputer network*, Comput. Struct., 47 (1993), pp. 407–418.
- [3593] H. YAN AND J. C. GORE, *Weight adjustment rule of neural networks for computing discrete 2-d Gabor transforms*, IEEE Trans. Acoust. Speech Signal Process, 38 (1990), pp. 1654–1656.
- [3594] Y. YAN, Q. HU, AND X. HE, *Parallel computation of Fourier transform on distributed memory computer system*, Wuhan U. J. Nat. Sci., 1 (1996), pp. 557–560.
- [3595] D. YANG, *C++ and Object Oriented Numeric Computing for Scientists and Engineers*, Springer–Verlag, New York, 2001.
- [3596] F. YANG, L. HAAS, M. PAINDAVOINE, AND C. MILAN, *Parallel implementation of a multiscale edges detection algorithm*, Wuhan U. J. Nat. Sci., 1 (1996), pp. 356–361.
- [3597] I. YAVNEH, *A method for devising efficient multigrid smoothers for complicated PDE systems*, SIAM J. Sci. Comput., 14 (1993), pp. 1437–1463.
- [3598] M. YAVUZ AND E. W. LARSEN, *Iterative methods for solving x-y geometry S_N problems on parallel architecture computers*, Nucl. Sci. Eng., 112 (1992), pp. 32–42.
- [3599] J. W. YOKOTA, *Diagonally inverted lower-upper factored implicit multigrid scheme for the three-dimensional Navier–Stokes equations*, AIAA J., 28 (1990), pp. 1642–1649.
- [3600] J. W. YOKOTA AND D. A. CAUGHEY, *LU implicit multigrid algorithm for the three-dimensional Euler equations*, AIAA J., 26 (1988), pp. 1061–1069.
- [3601] H. K. YONG AND Z. C. NAM, *Parallel solution of the neutron diffusion equation with the domain decomposition method on a transputer network*, Nucl. Sci. Eng., 114 (1993), pp. 252–270.
- [3602] S. YOON AND A. JAMESON, *Lower–upper symmetric–Gauss–Seidel method for the Euler and Navier–Stokes equations*, AIAA J., 26 (1988), pp. 1025–1026.
- [3603] S. YOON AND D. KWAK, *Multigrid convergence of an implicit symmetric relaxation scheme*, AIAA J., 32 (1994), pp. 950–955.
- [3604] D. P. YOUNG, R. G. MELVIN, M. B. BIETERMAN, F. T. JOHNSON, S. S. SAMATH, AND J. E. BUSSOLETTI, *A locally refined finite rectangular grid finite element method. Application to computational physics*, J. Comput. Phys., 92 (1991), pp. 1–66.
- [3605] W. S. YOUNG AND C. L. BROOKS, *Implementation of a data parallel, logical domain decomposition method for interparticle interactions in molecular dynamics of structured molecular fluids*, J. Comput. Chem., 15 (1994), pp. 44–53.
- [3606] H. YSERENTANT, *The convergence of multi-level methods for strongly nonuniform families of grids and any number of smoothing steps per level*, Computing, 30 (1983), pp. 305–313.
- [3607] ———, *Ober die Aufspaltung von Finite-Element-Räumen in Teilräume Verschiedener Ver-*

- feinerungsstufen*, PhD thesis, Rheinisch-Westfälischen Technischen Hochschule Aachen, Aachen, Germany, 1984.
- [3608] ———, *Hierarchical bases of finite-element spaces in the discretization of nonsymmetric elliptic boundary value problems*, Comput., 35 (1985), pp. 39–49.
- [3609] ———, *The convergence of multi-level methods for solving finite-element equations in the presence of singularities*, Math. Comp., 47 (1986), pp. 399–409.
- [3610] ———, *Hierarchical bases give conjugate gradient type methods a multigrid speed of convergence*, Appl. Math. Comp., 19 (1986), pp. 347–358.
- [3611] ———, *On the multi-level splitting of finite element spaces*, Numer. Math., 49 (1986), pp. 379–412.
- [3612] ———, *On the multi-level splitting of finite element spaces for indefinite elliptic boundary value problems*, SIAM J. Numer. Anal., 23 (1986), pp. 581–595.
- [3613] ———, *On the multilevel splitting of finite element spaces*, Numer. Math., 49 (1988), pp. 379–412.
- [3614] ———, *Two preconditioners based on the multi-level splitting of finite element spaces*, Numer. Math., 58 (1990), pp. 163–184.
- [3615] D. YU, *Domain decomposition methods for unbounded domains*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 125–132.
- [3616] W. YU, *A multigrid method for nonlinear parabolic problems*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 241–248.
- [3617] X. J. YU, *A multigrid method for nonlinear parabolic problems*, J. Comput. Math., 14 (1996), pp. 363–382.
- [3618] ———, *Multigrid method for the linear parabolic problem*, Math. Numer. Sin., 18 (1996), pp. 241–252.
- [3619] G.-A. ZAKERI, *Resolution function and adaptive refinement method for a system of conservation laws*, in Preliminary Proceedings of the Fifth Copper Mountain Conference on Multigrid Methods, T. A. Manteuffel and S. F. McCormick, eds., vol. 1, Denver, 1991, University of Colorado, pp. 105–111.
- [3620] E. ZAMPIERI, *A multidomain spectral collocation solver for the elasticity problem*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 614–623.
- [3621] T. A. ZANG AND M. Y. HUSSAINI, *On spectral multigrid methods for the time-dependent Navier-Stokes equations*, Appl. Math. Comput., 19 (1986), pp. 359–372.
- [3622] T. A. ZANG, Y. S. WONG, AND M. Y. HUSSAINI, *Spectral multi-grid methods for elliptic equations*, J. Comput. Phys., 48 (1982), pp. 485–501.
- [3623] ———, *Spectral multi-grid methods for elliptic equations*, in Multigrid Methods, H. Lomax, ed., NASA Conference Publication 2202, Ames Research Center, Moffett Field, CA, 1982, pp. 173–191.
- [3624] ———, *Spectral multigrid methods for elliptic equations II*, J. Comput. Phys., 54 (1984), pp. 489–507.
- [3625] Y. ZANG AND R. L. STREET, *A composite multigrid method for calculating unsteady incompressible flows in geometrically complex domains*, Int. J. Numer. Methods Fluids, 20 (1995), pp. 341–361.
- [3626] Y. ZANG, R. L. STREET, AND J. R. KOSEFF, *A non staggered grid, fractional step method for time dependent incompressible Navier Stokes equations in curvilinear coordinates*, J. Comput. Phys., 114 (1994), pp. 18–33.
- [3627] L. Y. ZASLAVSKY, *An adaptive algebraic multigrid for multigroup neutron diffusion reactor core calculations*, Appl. Math. Comput., 53 (1993), pp. 13–26.
- [3628] L. Y. ZASLAVSKY, *An adaptive algebraic multigrid for reactor criticality calculations*, SIAM J. Sci. Comput., 16 (1995), pp. 840–847.
- [3629] A. I. ZECEVIC AND D. D. SILJAK, *Balanced decompositions of sparse systems for multilevel parallel processing*, IEEE Trans. Circuits Syst. I, Fundam. Theory Appl., 41 (1994), pp. 220–233.
- [3630] J. ZENG, *Monotone additive Schwarz algorithms for solving two-side obstacle problems*, Wuhan U. J. Nat. Sci., 1 (1996), pp. 692–695.
- [3631] ———, *Geometric convergence of overlapping Schwarz methods for obstacle problems*, in Ninth International Conference on Domain Decomposition Methods, Bergen, 1997,

DDM.org, pp. 237–241.

- [3632] S. ZENG, C. VUIK, AND P. WESSELING, *Numerical solution of the incompressible Navier–Stokes equations by Krylov subspace and multigrid methods*, Adv. Comput. Math., 4 (1995), pp. 27–50.
- [3633] S. ZENG AND P. WESSELING, *Numerical study of a multigrid method with four smoothing methods for the incompressible Navier–Stokes equations in general coordinates*, in Sixth Copper Mountain Conference on Multigrid Methods, N. D. Melson, T. A. Manteuffel, and S. F. McCormick, eds., vol. CP 3224, Hampton, VA, 1993, NASA, pp. 691–708.
- [3634] ———, *Multigrid solution of the incompressible Navier–Stokes equations in general coordinates*, SIAM J. Numer. Anal., 31 (1994), pp. 1764–1784.
- [3635] ———, *An ILU smoother for the incompressible Navier Stokes equations in general coordinates*, Int. J. Numer. Meth. Fluids, 20 (1995), pp. 59–74.
- [3636] X. ZENG AND F. ZHAO, *Integral equation method via domain decomposition and collocation for scattering problems*, J. Appl. Mech., 62 (1995), pp. 186–192.
- [3637] Y. ZENG AND S. G. ABRAHAM, *Partitioning regular grid applications with irregular boundaries for cache-coherent multiprocessors*, in Proceedings of the 3rd IEEE International Symposium on High Performance Distributed Computing, Los Alamitos, CA, 1995, IEEE Comput. Soc. Press, pp. 222–228.
- [3638] C. ZENGER, *Sparse grids*, in Parallel algorithms for partial differential equations: Proceedings of the Sixth GAMM-Seminar, Kiel, Jan. 1990, vol. Notes on Numerical Fluid Mechanics, vol. 31, Vieweg, Braunschweig, 1991.
- [3639] H. W. ZHANG, *The convergence of the multigrid method using the symmetric Kaczmarz iteration as its smoothing method*, Acta Math. Applicatae Sin., 16 (1993), pp. 100–106.
- [3640] J. ZHANG, *Acceleration of five-point red-black Gauss-Seidel in multigrid for two dimensional Poisson equation*, Appl. Math. Comput., 80 (1996), pp. 73–93.
- [3641] ———, *A cost-effective multigrid projection operator*, J. Comput. Appl. Math., 76 (1996), pp. 325–333.
- [3642] ———, *Multigrid solution of convection-diffusion equation with high-Reynolds number*, in Preliminary Proceedings of 1996 Copper Mountain Conference on Iterative Methods: Vol. II, Copper Mountain, CO, 1996, p. 9 pages.
- [3643] ———, *Accelerated high accuracy multigrid solution of the convection-diffusion equation with high Reynolds number*, Numer. Meth. PDEs, 77 (1997), pp. 73–89.
- [3644] ———, *Minimal residual smoothing in multi-level iterative method*, Appl. Math. Comput., 84 (1997), pp. 1–25.
- [3645] ———, *Multigrid Acceleration Techniques and Applications to the Numerical Solution of Partial Differential Equations*, PhD thesis, The George Washington University, Washington, DC, 1997.
- [3646] ———, *Multigrid with inexact minimal residual smoothing acceleration*, Appl. Numer. Math., 24 (1997), pp. 501–512.
- [3647] ———, *On convergence of iterative methods with a fourth-order compact scheme*, Appl. Math. Lett., 10 (1997), pp. 49–55.
- [3648] ———, *Residual scaling techniques in multigrid, I: equivalence proof*, Appl. Math. Comput., 86 (1997), pp. 283–303.
- [3649] ———, *An explicit fourth-order compact finite difference scheme for three dimensional convection-diffusion equation*, Commun. Numer. Methods Engrg., 14 (1998), pp. 209–218.
- [3650] ———, *Fast and high accuracy multigrid solution of the three dimensional Poisson equation*, J. Comput. Phys., 143 (1998), pp. 449–461.
- [3651] ———, *Fourth-order compact discretization and iterative solution of the 3D convection-diffusion equation*, in Iterative Methods in Scientific Computation, J. Wang, M. B. Allen, B. M. Chen, and T. Mathew, eds., New Brunswick, NJ, 1998, IMACS, pp. 331–336.
- [3652] ———, *Multi-level minimal residual smoothing: a family of general purpose multigrid acceleration techniques*, J. Comput. Appl. Math., 100 (1998), pp. 41–51.
- [3653] ———, *On convergence and performance of iterative methods with fourth-order compact schemes*, Numer. Methods Partial Differential Equations, 14 (1998), pp. 262–283.
- [3654] ———, *Residual scaling techniques in multigrid, II: practical applications*, Appl. Math. Comput., 90 (1998), pp. 229–252.
- [3655] ———, *Two-grid analysis of minimal residual smoothing as a multigrid acceleration technique*, Appl. Math. Comput., 96 (1998), pp. 27–45.
- [3656] ———, *VML: a class of virtual multi-level iterative methods for solving partial differential equations*, Appl. Math. Comput., 92 (1998), pp. 29–48.

- [3657] ———, *Acceleration and stabilization properties of minimal residual smoothing technique in multigrid*, Appl. Math. Comput., 100 (1999), pp. 151–168.
- [3658] ———, *On preconditioning Schur complement and Schur complement preconditioning*, Elect. Trans. Numer. Anal., 10 (2000), pp. 115–130.
- [3659] L.-B. ZHANG, *Semi-coarsening in multigrid solution of steady incompressible Navier-Stokes equations*, J. Comput. Math., 8 (1990), pp. 92–97.
- [3660] L. B. ZHANG, *A multigrid solver for the steady incompressible Navier Stokes equations on curvilinear coordinate systems*, J. Comput. Phys., 113 (1994), pp. 26–34.
- [3661] ———, *Box line relaxation schemes for solving the steady incompressible Navier Stokes equations using second order upwind differencing*, J. Comput. Math., 13 (1995), pp. 32–39.
- [3662] S. ZHANG, *Multi-Level Iterative Techniques*, PhD thesis, Pennsylvania State University, State College, PA, 1988.
- [3663] ———, *On the convergence of spectral multigrid methods for solving periodic problems*, Calcolo, 28 (1991), pp. 185–203.
- [3664] ———, *Optimal order nonnested multigrid methods for solving finite element equations. III. On degenerate meshes*, Math. Comput., 64 (1995), pp. 23–49.
- [3665] X. ZHANG, *Studies in Domain Decomposition: Multilevel Methods and the Biharmonic Dirichlet Problem*, PhD thesis, Courant Institute, New York University, New York City, 1991.
- [3666] ———, *Domain decomposition algorithms for the biharmonic Dirichlet problem*, in Fifth International Symposium on Domain Decomposition Methods for Partial Differential Equations, D. E. Keyes, T. F. Chan, G. A. Meurant, J. S. Scroggs, and R. G. Voigt, eds., Philadelphia, 1992, SIAM, pp. 119–126.
- [3667] ———, *Multilevel Schwarz methods*, Numer. Math., 63 (1992), pp. 521–539.
- [3668] ———, *Parallelizing an oil refining simulation: Numerical methods, implementations and experience*, Parallel Comput., 21 (1995), pp. 627–647.
- [3669] S. ZHAO AND M. J. YEDLIN, *A new iterative Chebyshev spectral method for solving the elliptic equation $\nabla(\sigma \nabla u) = f$* , J. Comput. Phys., 113 (1994), pp. 215–223.
- [3670] X. ZHENG, C. LIU, C. LIAO, Z. LIU, AND S. F. MCCORMICK, *Multigrid method for modeling multi-dimensional combustion with detailed chemistry*, in Seventh Copper Mountain Conference on Multigrid Methods, N. D. Nelson, T. A. Manteuffel, S. F. McCormick, and C. C. Douglas, eds., vol. CP 3339, Hampton, VA, 1996, NASA, pp. 809–824.
- [3671] E. P. ZHIDKOV, G. E. MAZURKEVICH, AND B. N. KHOROMSKY, *Domain decomposition method for magnetostatics nonlinear problems in combined formulation*, Sov. J. Numer. Anal. Math. Modeling, 5 (1990), pp. 121–165.
- [3672] A. ZHOU, *A multi-parameter parallel algorithm for local higher accuracy approximation*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 283–290.
- [3673] G. ZHOU, *A new domain decomposition method for convection-dominated problems*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 341–348.
- [3674] K. ZHOU AND C. K. RUSHFORTH, *Image restoration using multigrid methods*, Appl. Opt., 30 (1991), pp. 2906–2912.
- [3675] L. ZHOU AND H. F. WALKER, *Residual smoothing techniques for iterative methods*, SIAM J. Sci. Comput., 15 (1994), pp. 297–312.
- [3676] S. ZHOU, *An additive Schwarz algorithm for a variational inequality*, in Domain Decomposition Methods in Sciences and Engineering, 8th International Conference, Beijing, P. R. China, John Wiley & Sons, Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 1997, pp. 133–137.
- [3677] S. Z. ZHOU AND B. W. CHENG, *Nonconforming element multigrid method for parabolic equations*, Math. Numer. Sin., 16 (1994), pp. 372–381.
- [3678] J. ZHU, *On the new parallel algorithm for the numerical solution of partial differential equations*, in Preliminary Proc. of the 4th Copper Mountain Conference on Multigrid Methods, J. Mandel and S. F. McCormick, eds., vol. 3, Denver, 1989, Computational Mathematics Group, Univ. of Colorado, pp. 169–182.
- [3679] J. ZHU AND Y. M. CHEN, *Multilevel grid method for history matching multi dimensional multi phase reservoir models*, Appl. Numer. Math., 10 (1992), pp. 159–174.
- [3680] Z. ZHU AND C. A. J. FLETCHER, *Study of sequential solutions for the reduced/complete Navier-Stokes equations with multigrid acceleration*, Comput. Fluids, 19 (1991), pp. 43–

- [3681] Z. W. ZHU, C. LACOR, AND C. HIRSCH, *A new residual smoothing method for multigrid acceleration applied to the Navier–Stokes equations*, in Multigrid Methods IV, Proceedings of the Fourth European Multigrid Conference, Amsterdam, July 6–9, 1993, vol. 116 of ISNM, Basel, 1994, Birkhäuser, pp. 345–356.
- [3682] S. G. ZIAVRAS AND D. P. SHAH, *Efficient implementation of multilevel algorithms on hypercube supercomputers for computer vision*, in Proceedings 1993 Computer Architectures for Machine Perception, Los Alamitos, CA, 1993, IEEE Comput. Soc. Press, pp. 313–322.
- [3683] O. C. ZIENKIEWICZ, *The Finite Element Method*, McGraw Hill, London, 1977.
- [3684] O. C. ZIENKIEWICZ, J. P. DE S. R. GAGO, AND D. W. KELLY, *The hierarchical concept in finite element analysis*, Comput. Struct., 16 (1983), pp. 53–65.
- [3685] P. H. ZIPKIN, *Aggregation in Linear Programming*, PhD thesis, Yale University, New Haven, 1977.
- [3686] ———, *Bounds on the effect of aggregating variables in linear programs*, Operations Research, 28 (1980), pp. 903–916.
- [3687] J. ZITKO, *Generalization of convergence conditions for restarted GMRES*, Numer. Lin. Alg. Appl., 7 (2000), pp. 117–131.
- [3688] G. ZUMBUSCH, *Parallel adaptively refined sparse grids*, in Multigrid Methods VI, vol. 14 of Lecture Notes in Computational Science and Engineering, Berlin, 2000, Springer–Verlag, pp. 285–292.
- [3689] G. W. ZUMBUSCH, *Adaptive parallele multilevel-methoden zur lösung elliptischer randwertprobleme*, diplomarbeit, Mathematisches Institut, TU München, Germany, 1992.
- [3690] ———, *Simultaneous h-p Adaptation in Multilevel Finite Elements*, PhD thesis, Fachbereich Mathematik und Informatik, FU Berlin, Germany, 1995. published by Shaker, Aachen, 1996.
- [3691] ———, *Symmetric hierarchical polynomials and the adaptive h-p-version*, Houston Journal of Mathematics, (1996), pp. 529–540. Proceedings of the Third International Conference on Spectral and High Order Methods, ICOSAHOM’95.