September 2014

Jan Mandel

Center for Computational Mathematics
Department of Mathematical & Statistical Sciences
University of Colorado Denver
Denver, Colorado 80217-3364
Telephone: (303)315-9703
E-mail: jan.mandel@ucdenver.edu
Web: http://math.ucdenver.edu/~jmandel

Education

Candidate of Sciences (CSc., Ph.D. equivalent), Numerical and Approximate Methods, Charles University, Prague, Czechoslovakia, 1983. Advisor B. Sekerka. Thesis title: *On Some Two-Level Iterative Methods*.
Doctor of Natural Sciences (RNDr., M.S. equivalent), Numerical Mathematics, Charles University, Prague, Czechoslovakia, 1978. Thesis title: *Application of Convex Analysis in Timetable Problems.*
Graduated (B.S. with honors equivalent), Faculty of Mathematics and Physics, Charles University, Prague, Czechoslovakia, 1978. Informatics. Specialization: Mathematical methods in economics.

Fields of Interest

Scientific computing: Data assimilation, wildland fire modeling, applied probability, statistics, numerical solution of partial differential equations, iterative methods

Professional Experience

Employment History

1986-present	University of Colorado Denver, Department of Mathematics. Assistant Professor (1986), Associate Professor (1989), Professor (1992).
1978-1986	Faculty of Mathematics and Physics, Charles University, Prague, Czechoslovakia. Graduate Research Assistant (1978), Research Staff (1982), Scientist (1983), Senior Scientist (1985).
1976-1978	Mototechna Corp., Prague, Czech Republic, Software Developer.

Other Positions

2012-present	Chair, Department of Mathematical and Statistical Sciences, University of Colorado Denver
2013-present	Senior Researcher, Institute for Computer Science, Czech Academy of Sciences, Prague, Czech Republic
2012-present	Lecturer, Ecole Nationale de la Météorologie, Météo France, Toulouse, France
2012	Senior Researcher, CERFACS and INP-ENSEEIHT, Toulouse, France
2011	Visiting Researcher, Institute for Computer Science, Czech Academy of Sciences

2006-2009 Visiting Scientist, Mesoscale and Microscale Meteorology Division, National Center for Atmospheric Research, Boulder, CO
1996-2004 Visiting, Department of Aerospace Engineering Science, University of Colorado at Boulder
1995-1999 Director, Graduate Program in Applied Mathematics, University of Colorado at Denver
1993-1994, 2000-2012 Director, Center for Computational Mathematics, University of Colorado Denver
1993 Visiting, Courant Institute, NY
1992-2014 President and founder of Solvers International, Inc., Boulder, CO
1990, 1989, 1988 IBM T. J. Watson Research Center, N.Y., Visiting Scientist.
1987 Visiting, Oxford University Computing Laboratory, Oxford, England.
1986-1987 Colorado Research Development Corporation, Scientist, part time.
1985 Visiting Research Associate, University of Colorado at Denver.

Bibliography

Refereed Journal Publications

1. L. Cobb, A. Krishnamurthy, J. Mandel, and J. D. Beezley: *Bayesian Tracking of Emerging Epidemics Using Data Assimilation Methods*, Spatial and Spatio-temporal Epidemiology 10, 39–48, **2014**
2. A. K. Kochanski, M. A. Jenkins, J Mandel, J. D. Beezley, C. B. Clements, *Evaluation of WRF-Sfire Performance with Field Observations from the FireFlux experiment*, Geoscientific Model Development, 6, 1109–1126, **2013**
3. B. Sousedik, J. Sistek, J. Mandel, *Adaptive-Multilevel BDDC and its parallel implementation*, Computing 95, 1087–1119, **2013**
4. A. K. Kochanski, M. A. Jenkins, S. K. Krueger, J. Mandel, and J. D. Beezley, *Real-time simulation of 2007 Santa Ana fires*, Forest Ecology and Management 15, 136–149, **2013**
5. J. Mandel, B. Sousedík and J. Šístek, Adaptive BDDC in Three Dimensions, *Mathematics and Computers in Simulation,* 82, 1812-1831, **2012**
6. J. Mandel, L. Cobb, and J. D. Beezley, On the Convergence of the ensemble Kalman filter, *Applications of Mathematics,* 56, 533-541, **2011**
7. J. Šístek, B. Sousedík, P. Burda, J. Mandel, and J. Novotny, Application of the parallel BDDC preconditioner to the Stokes flow, *Computers and Fluids*, 46, 429-435, **2011**
8. J. Mandel, J. D. Beezley, and Adam K. Kochanski, Coupled atmosphere-wildland fire modeling with WRF 3.3 and SFIRE 2011, *Geoscientific Model Development*, 4, 591-610, **2011**
9. D. H. Glueck, A. Karimpour-Fard, J. Mandel, and K. E. Muller, On probabilities for separating sets of order statistics, *Statistics*, 44, 145-153, **2010**
10. J. Šístek, J. Novotný, J. Mandel, M. Čertíková, and P. Burda, BDDC by a frontal solver and stress computation in a hip joint replacement, *Mathematics and Computers in Simulation*, 80, 1310-1323, **2010**
11. J. Mandel, J. D. Beezley, J. L. Coen, M. Kim, Data assimilation for wildland fires: Ensemble Kalman filters in coupled atmosphere-surface models, *IEEE Control Systems Magazine* 29, Issue 3, 47-65, June **2009**
12. B. Sousedík and J. Mandel, On the equivalence of primal and dual substructuring preconditioners, *Electronic Transactions in Numerical Analysis,* 31, 384-402, **2008**
13. J. Mandel, B. Sousedík, and C. R. Dohrmann, Multispace and multilevel BDDC, *Computing* 83, 55-85, **2008**

14. D. H. Glueck, J. Mandel, A. Karimpour-Fard, L. Hunter, and K. E. Muller, Exact Calculations of Expected Power for the Benjamini-Hochberg Procedure. *The International Journal of Biostatistics,* Vol. 4, Iss. 1, Art. 11, **2008**
15. J. Mandel, L. S. Bennethum, J. D. Beezley, J. L. Coen, C. C. Douglas, M. Kim, and A. Vodacek, A wildland fire model with data assimilation. *Mathematics and Computers in Simulation* 79, 584-606, **2008**
16. D. H. Glueck, A. Karimpour-Fard, J. Mandel, L. Hunter, and K. E. Muller, Fast computation by block permanents of cumulative distribution functions of order statistics from several populations, *Communications in Statistics - Theory and Methods*, 37(18), 2815-2824, **2008**
17. Jonathan D. Beezley and Jan Mandel, Morphing Ensemble Kalman Filters, *Tellus* 60A, 131-140, **2008**
18. C. J. Johns and J. Mandel, A Two-Stage Ensemble Kalman Filter for Smooth Data Assimilation, *Environmental and Ecological Statistics* 15, 101-110, **2008**
19. J. Mandel and B. Sousedík, BDDC and FETI-DP under Minimalist Assumptions, *Computing* 81, 269-280, **2007**
20. J. Mandel and B. Sousedík, Adaptive Selection of Face Coarse Degrees of Freedom in the BDDC and the FETI-DP Iterative Substructuring Methods, *Computer Methods in Applied Mechanics and Engineering* 196, 1389–1399, **2007**
21. J. Mandel, C. R. Dohrmann, and R. Tezaur, An Algebraic Theory for Primal and Dual Substructuring Methods by Constraints, *Applied Numerical Mathematics* 54, 167–193, **2005**
22. J. Mandel and M. Popa, Iterative solvers for coupled fluid-solid scattering, *Applied Numerical Mathematics* 54, 194–207, **2005**
23. J. Mandel and C. R. Dohrmann, Convergence of a Balancing Domain Decomposition by Constraints and Energy Minimization, *Numerical Lineal Algebra and Applications* 10, 639–659, **2003**
24. J. Mandel, Local Approximation Estimators for Algebraic Multigrid, *Electronic Transactions on Numerical Analysis* 15, 56–65, **2003**
25. G. Poole, Y-C. Liu, and J. Mandel, Advancing Analysis Capabilities in ANSYS through Solver Technology, *Electronic Transactions on Numerical Analysis* 15, 106-121, **2003**
26. J. Mandel, An Iterative Substructuring Method for Coupled Fluid-Solid Acoustic Problems, *Journal of Computational Physics* 177, 95-116, **2002**
27. J. Mandel and R. Tezaur, On the Convergence of a Dual-Primal Substructuring Method, *Numerische Mathematik* 88, 543-558, **2001**
28. P. Vaněk, M. Brezina, and J. Mandel, Convergence of Algebraic Multigrid Based on Smoothed Aggregation, *Numerische Mathematik* 88, 559-579, **2001**
29. D. J. Rixen, C. Farhat, R. Tezaur, and J. Mandel, Theoretical Comparison of the FETI and Algebraically Partitioned FETI Methods, and Performance Comparisons with Direct Sparse Solver, *International Journal for Numerical Methods in Engineering* 46, 501–534, **1999**
30. J. Mandel, M. Brezina, and P. Vaněk, Energy Optimization of Algebraic Multigrid Bases, *Computing* 62, 205–228, **1999**
31. J. Mandel, R. Tezaur, and C. Farhat, A Scalable Substructuring Method by Lagrange Multipliers for Plate Bending Problems, *SIAM J. Numer. Anal.* 36, 1370–1391, **1999**
32. R. Djellouli, C. Farhat, J. Mandel, and P. Vaněk, Continuous Fréchet Differentiability with respect to Lipschitz Domain and a Stability Estimate for Direct Acoustic Scattering Problems, *IMA J. Appl. Math.* 63, 51–69, **1998**
33. C. Farhat and J. Mandel, The Two-Level FETI Method for Static and Dynamic Plate Problems - Part I: An Optimal Iterative Solver for Biharmonic Systems, *Comp. Meth. Appl. Mech. Engrg.* 155, 129–152, **1998**
34. C. Farhat, P.-S. Chen, J. Mandel, and F.-X. Roux, The Two-Level FETI Method - Part II: Extension to Shell Problems, Parallel Implementation and Performance Results, *Comp. Meth. Appl. Mech. Engrg.* 155, 153–180, **1998**

35. P. Le Tallec, J. Mandel, and M. Vidrascu, A Neumann-Neumann Domain Decomposition Algorithm for Solving Plate and Shell Problems, *SIAM J. Numer. Anal.* 35, 836–867, **1998**
36. Z. Cai, J. Mandel, and S. McCormick, Multigrid Methods for Nearly Singular Linear Equations and Eigenvalue Problems, *SIAM J. Numer. Anal.* 34, 178–200, **1997**
37. J. Mandel and R. Tezaur, On the Convergence of a Substructuring Method with Lagrange Multipliers, *Numerische Mathematik* 73, 473–487, **1996**
38. P. Vaněk, J. Mandel, and M. Brezina, Algebraic Multigrid by Smoothed Aggregation for Second and Fourth Order Elliptic Problems, *Computing* 56, 179–196, **1996**
39. J. Mandel and M. Brezina, Balancing Domain Decomposition for Problems with Large Jumps in Coefficients, *Mathematics of Computation* 65, 1387–1401, **1996**
40. J. Mandel, Iterative Methods for *p*-Version Finite Elements: Preconditioning Thin Solids, *Comput. Meth. Appl. Mech. Engrg.* 133, 247–257, **1996**
41. C. Farhat, P. S. Chen, and J. Mandel, A Scalable Lagrange Multiplier Based Domain Decomposition Method for Time-Dependent Problems, *Int. J. Numer. Meth. Engrg.*, 38, 3831–3853, **1995**
42. L. C. Cowsar, J. Mandel, and M. F. Wheeler, Balancing Domain Decomposition for Mixed Finite Elements, *Mathematics of Computation* 64, 989–1015, **1995**
43. C. Farhat, J. Mandel, and F.-X. Roux, Optimal Convergence Properties of the FETI Domain Decomposition Method, *Comput. Methods Appl. Mech. Engrg.* 115, 365–3858, **1994**
44. J. Mandel, Hybrid Domain Decomposition with Unstructured Subdomains, Proceedings 6th International Symposium on Domain Decomposition Methods, *Contemporary Math.* 157 103–112, **1994**
45. J. Mandel, Iterative Solver for *p*-Version Finite Elements in Three Dimensions, Proceedings ICOSAHOM 1992; *Comp. Meth. Appl. Mech. Engrg.* 116, 175-183, **1994**
46. J. Mandel, Balancing domain decomposition, *Communications in Applied Numerical Methods* 9, 233–241, **1993**
47. C. C. Douglas and J. Mandel, Abstract theory for the domain reduction method, *Computing* 48, 73–96, **1992**
48. J. Mandel and G. S. Lett, Domain decomposition preconditioning for *p*-version finite elements with high aspect ratios, *Applied Numer. Math.* 8, 411–425, **1991**
49. Z. Cai, J. Mandel, and S. F. McCormick, The finite volume element method for diffusion equations on general triangulations, *SIAM J. on Numer. Anal.* 28, 392–402, **1991**
50. P. Bjørstad and J. Mandel, Spectra of sums of orthogonal projections and applications to parallel computing, *BIT* 31, 76-88, **1991**
51. J. Mandel, Some recent advances in multigrid methods, *Advances in Electronics and Electron Physics* 82, 327–377, **1991**
52. Babuška, A. W. Craig, J. Mandel, and J. Pitkäranta, Efficient preconditioning for the *p*-version finite element method in two dimensions, *SIAM J. on Numer. Anal* 28, 624–662, **1991**
53. Mandel, Iterative solvers by substructuring for the *p*-version finite element method, *Comput. Meth. Appl. Mech. Engrg.* 80, 117-128, **1990**
54. Mandel, On block diagonal and Schur complement preconditioning, *Numerische Mathematik* 58, 79–93, **1990**
55. J. Mandel, Two-level domain decomposition preconditioning for the *p*-version finite element method in three dimensions, *Int. J. Num. Meth. Engrg.*, 29, 5, 1095-1108, **1990**
56. E. Gelman and J. Mandel, Multilevel algorithms for optimization problems, *Mathematical Programming* 48, 1, 1-18, **1990**
57. J. Mandel and W. L. Miranker, New techniques for fast hybrid solution of systems of equations, *Int. J. Num. Meth. Engrg.* 27, 3, 455-468, **1990**
58. C. C. Douglas, J. Mandel, and W. L. Miranker, Fast Hybrid Solution of Systems of Linear Equations, *SIAM J. Sci. Stat. Computing* 11, 6, 1073-1086, **1990**

59. J. Mandel and S. V. Parter, On the multigrid F-cycle, *Applied Math. Computation* 37, 19–36, **1990**
60. J. Mandel and S. F. McCormick, A multilevel variational method for Au = λBu on composite grids, *J. of Computational Physics* 80, 2, 442-452, **1989**
61. J. Mandel, Algebraic study of multigrid methods for symmetric, definite problems, *Applied Mathematics and Computation* 25, 39-56, **1988**
62. J. Mandel, S. F. McCormick, and J. Ruge, An algebraic theory for multigrid methods for variational problems, *SIAM J. Numer. Anal.* 25, 91-110, **1988**
63. M. Kočvara and J. Mandel, A multigrid method for three-dimensional elasticity and algebraic convergence estimates, *Applied Mathematics and Computation* 23, 121-135, **1987**
64. J. Mandel and J. Nečas, Convergence of finite elements for transonic potential flows, *SIAM J. Numer. Anal.* 24, 985-997, **1987**
65. J. Mandel, On an iterative method for nonlinear variational inequalities, *Numerical Functional Analysis and Optimization* 8, 473-483, **1986**
66. J. Mandel, Multigrid convergence for nonsymmetric, indefinite variational problems and one smoothing step, *Applied Mathematics and Computation* 19, 201-216, **1986**
67. J. Mandel, On multilevel iterative methods for integral equations of the second kind and related problems, *Numerische Mathematik* 46, 147-157, **1985**
68. J.Mandel, A multilevel iterative method for symmetric, positive definite linear complementarity problems, *Applied Mathematics and Optimization* 11, 77-95, **1984**
69. J. Mandel, Convergence of the cyclical relaxation method for linear inequalities, *Mathematical Programming* 30, 218-228, **1984**
70. J. Mandel, On some two-level iterative methods, In: Defect Correction Methods, K. Böhmer and H. J. Stetter, editors, *Computing Supplementum* 5, pp. 75-88, **1984**. Springer-Verlag, Wien-New York.
71. J. Mandel, A convergent nonlinear splitting via orthogonal projection, *Aplikace Matematiky* 29, 250-257, **1984**.
72. J. Mandel, A convergence analysis of the iterative aggregation method with one parameter, *Linear Algebra and its Applications* 59, 159-169, **1984**
73. J. Mandel, Étude algébrique d'une méthode multigrille pour quelques problèmes de frontière libre, *Comptes Rendus Acad. Sci. Paris, Sér. I,* 298, 469-472, **1984**
74. M. Feistauer, J. Mandel, and J. Nečas, Entropy regularization of the transonic potential flow problem, *Comment. Math. Univ. Carolinae* 25, 431-443, **1984**
75. J. Mandel and B. Sekerka, A local convergence proof for the iterative aggregation method, *Linear Algebra and its Applications* 51, 163-172, **1983**
76. J. Mandel and B. Sekerka, Iterative method enabling solution of material balances (in Czech), *Ekonomicko-Matematický Obzor* 19, 52-63, **1983**
77. J. Mandel and B. Sekerka, Iterative aggregation and residue minimization in solution of input-output relations (in Czech), *Ekonomicko-Matematický Obzor* 18, 428-441, **1982**
78. J. Mandel, A least exchange theorem for the generalized timetable problem, *Elektronische Informationverabeitung und Kybernetik* 17, 633-636, **1981**
79. J. Mandel, Convergence of an iterative method for the system $Ax+y = x$ using aggregation, *Ekonomicko-Matematický Obzor* 17, 287-291, **1981**
80. J. Mandel and F. Turnovec, A quick matrix multiplication in the simplex algorithm, *Ekonomicko-Matematický Obzor* 17, 180-182, **1981**
81. J. Mandel, The duration of fluid outflow (in Czech), *Rozhledy Matematicko-Fyzikalni* 51, 26-28, **1972-73**

Refereed Conference Proceedings

82. M. Vejmelka, A. K. Kochanski, and J. Mandel, *Data assimilation of fuel moisture in WRF-SFIRE*, Proceedings of 4th Fire Behavior and Fuels Conference 2013, Wade, D. D. and Fox, R. L., eds., International Association of Wildland Fire, 122-137, **2014**
83. A. K. Kochanski, J. D. Beezley, J. Mandel, and C. B. Clements, *Air pollution forecasting by coupled atmosphere-fire model WRF and SFIRE with WRF-Chem*, Proceedings of 4th Fire Behavior and Fuels Conference 2013, Wade, D. D. and Fox, R. L., eds., International Association of Wildland Fire, 143-155, **2014**
84. N. Dobrinkova, S. Fidanova, I. Dimov, K. Atanasov, and J. Mandel, Game-method model and WRF-Fire model working together, *Monte Carlo Methods and Applications*, A. Sabelfeld and I. Dimov, eds., DeGruyter, Berlin, 79-86, **2013**
85. J. Sistek, J. Mandel, B. Sousedik and P. Burda, Parallel implementation of multilevel BDDC, *Numerical Mathematics and Advanced Applications 2011*, Cangiani, A.; Davidchack, R.L.; Georgoulis, E.; Gorban, A.N.; Levesley, J.; Tretyakov, M.V. (Eds.), Springer, 681-689, **2013**.
86. J. Sistek, J. Mandel, B. Sousedik, Some practical aspects of parallel adaptive BDDC method, *Conference Applications of Mathematics 2012*, J. Brandts, J. Chleboun, S. Korotov, K. Segeth, J. Sistek, T. Vejchodsky, Academy of Sciences of the Czech Republic, 253-266, **2012**
87. J. Beezley, M. Martin, P. Rosen, J. Mandel, A. K Kochanski. Data management and analysis with WRF and SFIRE, *Geoscience and Remote Sensing Symposium (IGARSS) 2012*, 5274-5277, IEEE, **2012**.
88. J. Mandel, J. D. Beezley, A. K. Kochanski, V. Y. Kondratenko, and M. Kim, Assimilation of Perimeter Data and Coupling with Fuel Moisture in a Wildland Fire – Atmosphere DDDAS, ICCS 2012, *Procedia Computer Science* 9, 1100-1109, **2012**.
89. G. Jordanov, J. D. Beezley, N. Dobrinkova, A. K. Kochanski, J. Mandel, and B. Sousedik, *Simulation of the 2009 Harmanli fire (Bulgaria)*, 8th International Conference on Large-Scale Scientific Computations, Sozopol, Bulgaria, June 6-10, 2011, *Lecture Notes in Computer Science* 7116, 291-298, Springer **2012**
90. Jonathan D. Beezley, Jan Mandel, and Loren Cobb, Wavelet Ensemble Kalman Filters, *Proceedings of the 6th IEEE International Conference on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications (IDAACS'2011), Prague, September 15-17, 2011,* pages 514-518, IEEE, **2011**
91. J. Šístek, P. Burda, J. Mandel, J. Novotný, and B. Sousedík. A parallel implementation of the BDDC for the Stokes flow. In A. Kuzmin, editor, *Computational Fluid Dynamics 2010*, Proceedings of 6th ICCFD Conference, St. Petersburg, Russia, July 12-16, 2010, pages 807-812. Springer, **2011**
92. N. Dobrinkova, G. Jordanov, and J. Mandel, WRF-Fire Applied in Bulgaria, *Numerical Methods and Applications,* Dimov, I., Dimova, S., and Kolkovska, N., Eds, Lecture Notes in Computer Science 6046, 133-140, Springer, **2011**
93. J. Mandel and B. Sousedík, Coarse spaces over the ages. *Domain Decomposition Methods in Science and Engineering XIX,* Y. Huang, R. Kornhuber, O. Widlund, J. Xu, Eds., Lecture Notes in Computational Science and Engineering 78, Part 2, 213-220, **2011**
94. B. Sousedík and J. Mandel, On Adaptive-Multilevel BDDC, *Domain Decomposition Methods in Science and Engineering XIX,* Y. Huang, R. Kornhuber, O. Widlund, J. Xu, Eds., Lecture Notes in Computational Science and Engineering 78, Part 2, 39-50, **2011**
95. J. Šístek, P. Burda, J. Mandel, J. Novotný, and B. Sousedík, A Parallel Implementation of the BDDC Method for the Stokes Flow, *Parallel Computational Fluid Dynamics, Recent*

Advances and Future Directions, Biswas, R., Ed., DEStech Publications, Lancaster, Pennsylvania, **2010**, pp. 289-296.

96. A. Krishnamurthy, L. Cobb, J. Mandel and J. Beezley, Bayesian tracking of emerging epidemics using ensemble optimal statistical interpolation (EnOSI), *Section on Statistics in Epidemiology, Proceedings of the Joint Statistical Meetings*, American Statistical Society, 3471-3485, **2010**
97. J. Mandel, J. D. Beezley, and V. Y. Kondratenko, Fast Fourier Transform Ensemble Kalman Filter with Application to a Coupled Atmosphere-Wildland Fire Model, A. M. Gil-Lafuente, J. M. Merigo (Eds.) *Computational Intelligence in Business and Economics*, Proceedings of MS'10, World Scientific, 777-784, **2010**
98. J. Mandel, J. D. Beezley, and L. Cobb, Data Driven Computing by the Morphing Fast Fourier Transform Ensemble Kalman Filter in Epidemic Spread Simulations, in: Proceedings of ICCS10*, Procedia Computer Science* 1, 1215–1223, **2010**.
99. J. Mandel and J. D. Beezley, An Ensemble Kalman-Particle Predictor-Corrector Filter for Non-Gaussian Data Assimilation, ICCS 2009, *Lecture Notes in Computer Science* 5545, 470-478, Springer, **2009**
100. J. D. Beezley, S. Chakraborty, J. L. Coen, C. C. Douglas, J. Mandel, A. Vodacek, Z. Wang, Real-Time Data Driven Wildland Fire Modeling, ICCS 2008, *Lecture Notes in Computer Science* 5103, 46-53, Springer, **2008**
101. J. Mandel, J. D. Beezley, S. Chakraborty, J. L. Coen, C. C. Douglas, A. Vodacek, and Z. Wang, Towards a Real-Time Data Driven Wildland Fire Model, *IEEE Conference on Parallel and Distributed Processing (IPDPS 08)*, IEEE, 1-5, **2008**
102. J. Mandel, J. D. Beezley, L. S. Bennethum, S. Chakraborty, J. L. Coen, C. C. Douglas, J. Hatcher, M. Kim, and A. Vodacek, A Dynamic Data Driven Wildland Fire Model, ICCS 2007, Part I, *Lecture Notes in Computer Science* 4487, 1042-1049, Springer, **2007**
103. J. Mandel, B. Sousedik, and C. R. Dohrmann, On multilevel BDDC, in: Proceedings Domain Decomposition Methods in Science and Engineering XVII, *Lecture Notes in Computational Science and Engineering* 60, 287-294, Springer, **2007**
104. J. Mandel and B. Sousedík, Adaptive Coarse Space Selection in the BDDC and the FETI-DP Iterative Substructuring Methods: Optimal Face Degrees of Freedom, Proceedings 16th International Conference on Domain Decomposition, *Lecture Notes in Computational Science* 55, 421-428, Springer, **2007**
105. C. C. Douglas, D. Bansal, J. D. Beezley, L. S. Bennethum, S. Chakraborty, J. L. Coen, Y. Efendiev, R. E. Ewing, J. Hatcher, M. Iskandarani, C. R. Johnson, M. Kim, Deng Li, R. A. Lodder, J. Mandel, G. Qin, and A. Vodacek, Dynamic data-driven application systems for empty houses, contaminant tracking, and wildland fireline prediction, *Grid-Based Problem Solving Environments, Proceedings IFIP TC2/WG2.5 2006*, P. Gaffney and Pool, J.C.T., editors, IFIP series, 255-272, Springer, **2007**
106. C. C. Douglas, R. A. Lodder, J. D. Beezley, J. Mandel, R. E. Ewing, Y. Efendiev, G. Qin, M. Iskandarani, J. Coen, A. Vodacek, M. Kritz, and G. Haase, DDDAS approaches to wildland fire modeling and contaminant tracking, in *Proceedings of the 2006 Winter Simulation Conference*, R. Fujimoto, L. F. Perrone, F. P. Wieland, J. Liu, B. G. Lawson, D. M. Nicol, and R. P. Fujimoto (eds.), INFORMS, **2006**, pp. 2117-2124.
107. C. C. Douglas, J. D. Beezley, J. L. Coen, D. Li, W. Li, A. K. Mandel, J. Mandel, G. Qin, and A. Vodacek, Demonstrating the Validity of a Wildfire DDDAS, Proceedings ICCS 2006 part III, *Lecture Notes in Computer Science* 3993, 522-529, Springer, **2006**
108. J. Mandel, L. S. Bennethum, M. Chen, J. L. Coen, C. C. Douglas, L. P. Franca, C. J. Johns, M. Kim, A. V. Knyazev, R. Kremens, V. Kulkarni, G. Qin, A. Vodacek, J. Wu, W. Zhao, and A. Zornes, Towards a Dynamic Data Driven Application System for Wildfire Simulation, Proceedings ICCS 2005, *Lecture Notes in Computer Science* 3515, 632-639, Springer, **2005**

109. J. Mandel, M. Chen, J.L. Coen, C.C. Douglas, L.P. Franca, C. Johns , R. Kremens, A. Puhalskii, A. Vodacek, W. Zhao, A Note on Dynamic Data driven wildfire modeling, Proceedings ICCS 2004, *Lecture Notes in Computer Science* 3038, 725–731, **2004**
110. J. Mandel, Substructuring with Lagrange Multipliers for Coupled Fluid-Solid Scattering, Domain Decomposition Methods in Science and Engineering, *Proceedings of the Fourteenth International Conference on Domain Decomposition Methods*, edited by I. Herrera, D. E. Keyes, O. B. Widlund, and R. Yates, UNAM, Mexico City, **2003**
111. P. Vaněk, J. Mandel, and M. Brezina, Two-level Algebraic Multigrid for the Helmholtz Problem, Proceedings 10th International Conference on Domain Decomposition, *Contemporary Mathematics* 218, 349-356, **1998**
112. C. Farhat and J. Mandel, Scalable Substructuring by Lagrange Multipliers in Theory and Practice, *The 9th International Conference on Domain Decomposition*, Bergen, Norway, June, 1996, DDM.ORG, Bergen, Norway, 20-30, **1998**
113. Patrick Le Tallec, Jan Mandel, and Marina Vidrascu, Balancing Domain Decomposition for Plates, Proceedings of the 7th International Symposium on Domain Decomposition Methods, *Contemporary Math.* 180, 515–524, **1994**, American Mathematical Society, Providence, RI
114. J. Mandel, Hierarchical preconditioning and partial orthogonalization for the *p*-version finite element method, in *Domain Decomposition Methods for Partial Differential Equations III*, T.F. Chan, R. Glowinski, J. Periaux, O.B. Widlund, eds., Proceedings of the Third International Conference on Domain Decomposition Methods, SIAM, Phialdelphia, **1990**
115. C. C. Douglas and J. Mandel, The Domain Reduction Method: High Way Reduction in Three Dimensions and Convergence with Inexact Solvers, J. Mandel, S. McCormick, J. Dendy, C. Farhat, G. Lonsday, S. Parter, J. Ruge, and K. Stüben, editors, *Proceedings of the 4th Copper Mountain Conference on Multigrid Methods,* SIAM, Philadelphia, **1989**
116. J. Mandel and S. F. McCormick, Iterative solution of elliptic equations with refinement: The model multi-level case, In: *Domain Decomposition Methods*, Proceedings of the Second International Conference, T. F. Chan, R. Glowinski, J. Periaux, and O. B. Widlund, editors, SIAM, Philadelphia, pp. 81-92, **1989**
117. J. Mandel and S. F. McCormick, Iterative solution of elliptic equations with refinement: The two-level case, In: *Domain Decomposition Methods*, Proceedings of the Second International Conference, T. F. Chan, R. Glowinski, J. Periaux, and O. B. Widlund, editors, SIAM, Philadelphia, pp. 93-102, **1989**
118. N. Decker, J. Mandel, and S. Parter, On the role of regularity in multigrid methods, In: *Multigrid Methods, Proceedings of the 3rd Copper Mountain Conference,* S. F. McCormick, J. E. Dendy, Jr., J. Mandel, S. Parter, and J. Ruge, editors, Marcel Dekker, New York, pp. 143-156, **1988**
119. J. Mandel and H. Ombe, Fourier analysis of a multigrid method for 3D elasticity, In: *Multigrid Methods, Proceedings of 3rd Copper Mountain Conference,* S. F. McCormick, J. Dendy, J. Mandel, S. Parter, and J. Ruge, editors, Marcel Dekker, New York, pp. 389-412, **1988**
120. J. Mandel, On multigrid and iterative aggregation methods for nonsymmetric problems, In: *Multigrid Methods, Proceedings of the 2nd European Conference on Multigrid Methods,* Köln, 1985 (W. Hackbusch and U. Trottenberg, eds.) *Lecture Notes in Mathematics* 1228, 219-231, Springer Verlag, Berlin, **1986**.

Books, Book Chapters, Special Journal Issues

121. J. Mandel, A. K. Kochanski, M. Vejmelka, J. D. Beezley, Data Assimilation of Active Fire Detection in Coupled Atmosphere-Fire Simulations by WRF-SFIRE, *Advances in Forest Fire Research*, D.X. Viegas (ed), Coimbra University Press, 2014, in print.
122. A. Kochanski, J. D. Beezley, M. A. Jenkins, M. Vejmelka, J. Mandel, An integrated approach to fire emission forecasting, *Advances in Forest Fire Research*, D.X. Viegas (ed), Coimbra University Press, 2014, in print.
123. C. Clements, B. Davis, D. Seto, J. Contezac, A. Kochanski, J. B. Filippi, S. Krueger, B. Butler, B. Vihnanek, R. Ottmar, J. O'brien, N. Lareau, T. Barboni, J. Mandel, R. Kremens, W. Heilman, M. A. Jenkins, C. Teske, D. Jimenez, K. Prochazka, Overview of the 2013 FireFlux-II Grass Fire Field Experiment, *Advances in Forest Fire Research*, D.X. Viegas (ed), Coimbra University Press, 2014, in print.
124. A. V. Knyazev and J. Mandel, Sixth International Symposium on Iterative Methods in Scientific Computing, *Applied Numerical Mathematics* 54, **2005**
125. J. Mandel, C. Farhat, and X.-C. Cai, editors, *Domain Decomposition Methods 10*. The Tenth International Conference on Domain Decomposition, Boulder, CO, August 1997. Vol. 218 of Contemporary Mathematics, AMS, Providence, **1998**
126. J. Mandel, Adaptive iterative solvers in finite elements, in *Solving Large Scale Problems in Mechanics: The Development and Application of Computational Solution Methods*, M. Papadrakakis, editor, J. Wiley & Sons, London, pp. 65 – 88, **1993**
127. J. Mandel and G. Carey, Multigrid Methods, proceedings of Copper Mountain Conference, *Communications in Applied Numerical Methods*, 8, 9-10, **1992**
128. J. Mandel, S. McCormick, J. Dendy, C. Farhat, G. Lonsday, S. Parter, J. Ruge, and K. Stüben, editors, *Proceedings of the Fourth Copper Mountain Conference on Multigrid Methods*, SIAM, Philadelphia, **1989**
129. S. McCormick, J. Dendy, J. Mandel, S. Parter, and J. Ruge, editors, *Multigrid Methods*, *Proceedings of the Third Copper Mountain Conference on Multigrid Methods,* Marcel Dekker, New York, **1988**
130. J. Mandel, S. McCormick and R. Bank, Variational Multigrid Theory, in *Multigrid Methods*, S. McCormick, editor, SIAM, Philadelphia, pp. 131–177, **1987**

Non-refereed Conference Proceedings and Papers

131. J. Mandel, S. Amram, J. D. Beezley, G. Kelman, A. K. Kochanski, V. Y. Kondratenko, B. H. Lynn, B. Regev, M. Vejmelka, New features in WRF-SFIRE and the wildfire forecasting and danger system in Israel. N*atural Hazards and Earth System Sciences Discussions*, 2, 1759-1797, **2014**
132. A. K. Kochanski, J. D. Beezley, J. Mandel, and M. Kim, WRF fire simulation coupled with a fuel moisture model and smoke transport by WRF-Chem, *2012 WRF Users Workshop*, Boulder, CO, June **2012**
133. J. D. Beezley, A. Kochanski, V. Y. Kondratenko, and J. Mandel, Integrating high-resolution static data into WRF for real fire simulations, *Ninth Symposium on Fire and Forest Meteorology*, Palm Springs, CA, October **2011**
134. J. Mandel, J. D. Beezley, A. Kochanski, V. Y. Kondratenko, L. Zhang, E. Anderson, J. Daniels II, C. T. Silva, and C. Johnson, A wildland fire modeling and visualization environment, *Ninth Symposium on Fire and Forest Meteorology*, Palm Springs, CA, October 2011
135. A. Kochanski, M. A. Jenkins, S. K. Krueger, J. Mandel, J. D. Beezley, and C. B. Clements, Coupled atmosphere-fire simulations of FireFlux: Impacts of model resolution on its performance, *Ninth Symposium on Fire and Forest Meteorology*, Palm Springs, CA, October **2011**

136. V. Y. Kondratenko, J. D. Beezley, A. K. Kochanski, and J. Mandel, Ignition from a Fire Perimeter in a WRF Wildland Fire Model, *12th Annual WRF User's Workshop*, Boulder, CO, June **2011**
137. J. Sistek, P. Burda, M. Certikova, J. Mandel, and B. Sousedik, Parallel implementation of the three-level BDDC method, Proceedings of SNA'11, Roznov pod Radhostem, 108-111, Institute of Geonic AS CR, January 2011,.
138. J. Mandel, J. D. Beezley, and A. K. Kochanski, Coupled atmosphere-wildland fire modeling with WRF-Fire 3.3, *Geoscientific Model Development Discussions,* (GMDD) 4, 497-545, **2011**
139. J. Mandel, J. D. Beezley, and A. K. Kochanski, An overview of the coupled atmosphere-wildland fire model WRF-Fire, *AMS 91st Annual Meeting*, Seattle, WA, January **2011**.
140. J. Šístek, P. Burda, J. Mandel, J. Novotný, and B. Sousedík, Application of the BDDC method to the Stokes problem, *Proceedings of 2010 SNA conference,* Institute of Computer Science Institute AS CR, Prague, **2010**, pp. 131-134
141. J. Šístek, P. Burda, A. Damasek, J. Mandel, J. Novotný, B. Sousedík, On a parallel implementation of the BDDC method and its application to the Stokes problem, *2009 Parallel Computational Fluid Dynamics (ParCFD) Conference*, NASA Moffett Field, CA, May **2009**, pp. 183-187
142. J. L. Coen, J. D. Beezley, L. S. Bennethum, C. C. Douglas, M. Kim, R. Kremens, J. Mandel, G. Qin, and A. Vodacek, A Wildland Fire Dynamic Data-driven Application System, *11th Symposium on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface (IOAS-AOLS)*, CD-ROM, Paper 3.12, 87th American Meteorological Society Annual Meeting, San Antonio, TX, January **2007**
143. J. Mandel and J. D. Beezley, Predictor-Corrector and Morphing Ensemble Filters for the Assimilation of Sparse Data into High-Dimensional Nonlinear Systems, *11th Symposium on Integrated Observing and Assimilation Systems for the Atmosphere, Oceans, and Land Surface (IOAS-AOLS)*, CD-ROM, Paper 4.12, 87th American Meteorological Society Annual Meeting, San Antonio, TX, January **2007**
144. C. Farhat, F. Hemez, and J. Mandel, *Improving the Convergence Rate of a Transient Substructuring Iterative Method Using the Rigid Body Modes of its Static Equivalent*, AIAA Paper 95-1271, AIAA 36th Structural Dynamics Meeting, New Orleans, Louisiana April 10-13, **1995**
145. P. Le Tallec, J. Mandel, and M. Vidrascu, Parallel Domain Decomposition Algorithms for Solving Plate and Shell Problems, In: *Advances in Parallel and Vector Processing for Structural Mechanics*, B.H.V. Topping and M. Papadrakakis, editors, (Proceedings, Athens, 1994), pp. 139-145, CIVIL-COMP Ltd, Edinburgh, **1994**
146. S. Ghosal, J. Mandel, and R. Tezaur, Automatic Substructuring for Domain Decomposition, *Proceedings of IEEE International Conference on Neural Networks*, Orlando, June, 1994, vol. 6, pp. 3816–3821, IEEE, **1994**
147. J. Mandel, Intelligent Block Iterative Methods, FEM Today and the Future, *Proceedings of the 7th World Congress on Finite Elements,* Monte Carlo, November 1993, J. Robinson, ed., Robinson and Associates, Okehampton, Devon EX20 4NT, England, pp. 471–477, **1993**
148. J. Mandel, Fast Iterative Solver for Finite Elements Using Incomplete Elimination, *Proceedings of the 1991 MSC World Users' Conference,* Los Angeles, March **1991**, and Preliminary proceedings of the 5th Copper Mountain Conference on Multigrid Methods, April 1991
149. J. Mandel, On Iterative Methods for Linear Inequalities, In: Mathematical Programming, Abstracts of the XI. International Symposium on Mathematical Programming, University of Bonn, Germany, **1981**

Reports and Theses

150. J. Mandel, Introduction to Infinitely-Dimensional Statistics and Applications, lecture notes, **2012**.
151. J. D. Beezley, J. L. Coen, J. Mandel: WRF-Fire. In *ARW Version 3 Modeling System User's Guide*, W. Wang et al., National Center for Atmospheric Research, January **2012** (yearly updates, original edition 2010)
152. J. Mandel, J. D. Beezley, K. Eben, P. Jurus, V. Y. Kondratenko, and J. Resler, *Data assimilation by morphing fast Fourier transform ensemble Kalman filter for precipitation forecasts using radar images*, UCD CCM Report 289, April **2010**
153. J. Mandel and V. V. Kulkarni, *Constructing a Level Set Function for Fireline Data Assimilation*, CCM Report 234, June **2006**
154. J. Mandel and J. D. Beezley, *Predictor-Corrector Ensemble Filters for the Assimilation of Sparse Data into High Dimensional Nonlinear Systems,* CCM Report 232, June **2006**
155. J. Mandel, *Efficient Implementation of the Ensemble Kalman Filter*, CCM Report 231, May **2006**
156. J. Mandel, M. Chen, J.L. Coen, C.C. Douglas, L.P. Franca, C. Johns , R. Kremens, A. Puhalskii, A. Vodacek, W. Zhao, *Dynamic Data driven wildfire modeling,* CCM Report 208, March **2004**
157. P. Mayer and J. Mandel, *The Finite Ray Element Method for the Helmholtz Equation of Scattering: First Numerical Experiments,* UCD/CCM Report 111, **1997**
158. P. Vaněk, J. Mandel, and M. Brezina, *Solving a two-dimensional Helmholtz problem using algebraic multigrid,* UCD/CCM Report 110, **1997**
159. J. Mandel and M. Popa, *A multigrid method for elastic scattering*, CD/CCM Report 109, **1997**
160. J. Mandel, R. Tezaur, and C. Farhat, *Optimal Lagrange Multiplier Based Domain, Decomposition Method for Plate Bending Problems*, UCD/CCM Report 61, **1995**
161. P. Vaněk, J. Mandel, and M. Brezina, *Algebraic Multigrid on Unstructured Meshes,* UCD/CCM Report 34, **1994**
162. S. Ghosal and J. Mandel and R. Tezaur, *Fast Neural Networks for Domain Decomposition in Finite Element Analysis,* UCD/CCM Report 23, **1994**
163. J. Mandel and M. Brezina, *Balancing domain decomposition: Theory and performance in two and three dimensions,* UCD/CCM Report 2, **1993**
164. J. Mandel, An efficient domain decomposition preconditioner for the p-version finite element method in three dimensions, manuscript for *7th International Conference on Finite Element Methods in Flow Problems*, April 3-7, 1989, The University of Alabama in Huntsville, **1989**
165. J. Mandel, QRINV - *Inversion of Large Matrices by QR Decomposition,* Computing Centre Report, Charles University, Prague, **1986**
166. J. Nečas, J. Hlaváček, J. Mandel, and J. Roubíček, *Numerical Solution of Thermo-Elasticity Problems,* Annual Report, Charles University, Prague, **1985**
167. J. Mandel, *A Note On the Relational Database Machine Architecture,* Computing Centre Report, Charles University, Prague, **1984**
168. J. Nečas, J. Hlavaváček, J. Mandel, and J. Roubíček, *Numerical Solution of Thermo-Elasticity Problems,* Annual Report, Charles University, Prague, **1984**
169. J. Mandel, *An Extended COBOL Compiler Using Generation of Declarations from PSL/PSA and a Preprocessor of Decision Tables PROTAB-25*, Computing Centre Report, Charles University, Prague, **1984**
170. J. Mandel, *Multilevel Iterative Methods for Some Variational Inequalities and Optimization Problems,* Computing Centre Report, Charles University, Prague, **1983**

171. J. Mandel, *Convergence of Some Two-Level Iterative Methods,* Ph.D. Thesis, Charles University, Prague, **1982**
172. J. Mandel, *Application of Convex Analysis in Timetable Problems,* M.S. Thesis, Charles University, Prague, **1978**

Book Reviews

173. J. Mandel, *Multigrid Methods and Applications by Wolfgang Hackbusch*, SIAM Review 30, 519-520, **1988**

Submitted for Publication

174. J. Mandel, E. Bergou, and S. Gratton, *4DVAR by ensemble Kalman smoother*, arXiv:1304.5271, **2013**
175. Mandel, J., J. D. Beezley, G. Kelman, A. K. Kochanski, V. Y. Kondratenko, B. H. Lynn, and M. Vejmelka, 2013: *New features in WRF-SFIRE and the wildfire forecasting and danger system in Israel*. Natural Hazards and Earth System Sciences, in review. Numerical Wildfires, Cargese, Corsica, France, May 13–18, **2013**.
176. E. Kwiatkowski and J. Mandel, *Convergence of the Square Root Ensemble Kalman Filter in the Large Ensemble Limit,* Journal on Uncertainty Quantification, in revision, **2014**. arXiv:1404.4093
177. M. Vejmelka, A. K. Kochanski, and J. Mandel, *Data assimilation of surface observations into models of fuel moisture*, International Journal of Wildland Fire, in review, **2014**
178. A. K. Kochanski, M. A. Jenkins, K. Yedinak, J. Mandel, J. D. Beezley, B. Lamb, *Toward an integrated system for fire, smoke, and air quality simulations.* International Journal of Wildland Fire, in review, **2014**

Presentations at Conferences and Symposia

(For presentations with a paper, see Refereed and Non-refereed Conference Proceedings, and Submitted for Publication.)

July 2013 *Stochastic solution of large least squares systems in variational data assimilation*, Invited plenary lecture (with S. Gratton and E. Bergou), Preconditioned Iterative Methods (PIM13), Prague, Czech Republic

May 2013 *New developments in WRF-SFIRE*, Invited plenary lecture (with Adam Kochnanki, Jonathan Beezley, Volodymyr Kondratenko, and Martin Vejmelka), Numerical Wildfires, Cargese, Corsica, France

May 2013 *Forecasting of smoke and wildfire emissions using WRF-Sfire*, Adam Kochanski (presenting), J. D. Beezley, J. Mandel, and C. B. Clements, Numerical Wildfires, Cargese, Corsica, France

January 2013 *Hybrid 4DVAR and nonlinear ensemble Kalman smoother methods* (with S. Gratton and E. Bergou), American Meteorological Society 93rd Annual Meeting, Austin, TX

January 2013 *Assimilation of fire perimeter data into the fire spread model SFIRE coupled with the WRF model*, Volodymyr Kondratenko (presenting), J. D. Beezley, J. Mandel, and A. Kochanski, poster, American Meteorological Society 93rd Annual Meeting, Austin, TX

January 2013 *Wildland fire emissions forecasting by coupled atmosphere-fire model WRF-SFIRE and WRF-Chem*, Adam Kochanski (presenting), J. D. Beezley, J. Mandel,

and C. B. Clements, American Meteorological Society 93rd Annual Meeting, Austin, TX

June 2012 *Convergence of the Ensemble Kalman Filter in Hilbert Space*, University of Toulouse Paul Sabatier, France

October 2011 *Tracking Emerging Infectious Disease Epidemics In Real-Time Using Bayesian Data Assimilation*, A Krishnamurthy (presenting), L. Cobb, J. Mandel, and J. Beezley, Poster, GEOMED 2011, Victoria, BC, Canada

August 2011 *Tracking Emerging Infectious Disease Epidemics In Real-Time Using Spectral Bayesian Data Assimilation,* A. Krishnamurthy (presenting), L. Cobb, J. Mandel and J. Beezley, Joint Statistical Meetings (JSM), Section on Statistics in Epidemiology

June 2011 *Spectral and morphing ensemble Kalman filters and applications* (with J. D. Beezley, L. Cobb, A. Krishnamurthy, A. K. Kochanski, K. Eben, P. Jurus, and J. Resler), 31st Annual International Symposium on Forecasting, Prague, Czech Republic

June 2011 Invited plenary lecture, *Wildland fire modeling on computer clusters* (with J. D. Beezley, N. Dobrinkova, G. Jordanov, A. K. Kochanski, V. Y. Kondratenko, and B. Sousedik), International conference Monitor II, Bolzano, Italy.

January 2011 Jan Mandel, Jonathan D. Beezley, and Loren Cobb, *Spectral and morphing ensemble Kalman filters*, AMS 91st Annual Meeting, Seattle, WA, January 2011 December 2010 *Evaluation of The Fire Plume Dynamics Simulated by WRF-Fire*, A. Kochanski (presesenting), M. Jenkins, S. K. Krueger, J. Mandel, J. D. Beezley, C. B. Clements, AGU Fall Meeting, 2010

December 2010 *Wildland fire simulation by WRF-Fire* (poster, with J. D. Beezley, A. K. Kochanski, V. Y. Kondratenko, B. Sousedik, E. Anderson, and J. Daniels), AGU Fall Meeting, San Francisco, CA

December 2010 Invited plenary lecture, *Coupled atmosphere-wildland fire simulation by WRF-Fire*, IMA Workshop Numerical Solutions of Partial Differential Equations: Fast Solution Techniques

November 2009 *Morphing ensemble Kalman filter and applications* (with J. Beezley), UCD CCM Colloquium

October 2009 *Convergence of the Ensemble Kalman Filter* (with L. Cobb and J. Beezley), Department of Statistics, Colorado State University, Fort Collins, CO

August 2009 Invited plenary speaker, *Adaptive multilevel BDDC,* 19th International Conference on Domain Decomposition, Zhangjiajie, China

August 2009 Invited lecture, *Coarse space through the ages,* Minisymposium on Coarse Spaces, 19th International Conference on Domain Decomposition, Zhiangjiajie, China

August 2008 Invited speaker, *Data assimilation by morphing ensemble Kalman filters with application to wildland fires*, Workshop on sensing in environmental systems, LNCC, Petropolis, Brazil

April 2008 *Towards a Real-Time Data Driven Wildland Fire Model* (with the wildfires team), IPDPS08, Miami

August 2007 Invited plenary speaker, *Multilevel and multispace BDDC*, with B. Sousedik and C. Dohrmann, Computational Methods with Applications, Computational Linear Algebra and Applications, Harrachov, Czech Republic

October 2006 Invited speaker, *Ensemble Kalman Filters for Wildfire Simulation* (with the DDDAS wildfires team), Center for Subsurface Modeling Industrial Sponsors meeting, University of Texas at Austin

April 2006	Invited lecture, *Coupled Weather-Wildfire Modeling Driven by Sensor and Image Data*, (with the DDDAS wildfires team), NSF Workshop on Cyber-Based Combustion Science, NSF, Arlington, VA
July 2003	Invited plenary speaker, Industrial Mathematics and Mathematical Modelling, Rožnov pod Radhoštěm, Czech Republic, *Tutorial on Mathematical Foundations of Iterative Substructuring Methods*
June 2003	Fast Solvers for Partial Differential Equations, Oberwolfach (by invitation only), *An Algebraic Convergence Theory for Primal and Dual Substructuring Methods by Constraints*
March 2003	Sixth IMASC Symposium on Interative Methods in Linear Algebra, *Algebraic Convergence Theory for Substructuring*
January 2002	Invited plenary speaker, International Conference on Domain Decomposition 14, Cocoyoc, Mexico, *Iterative substructuring for fluid-solid acoustics*
June 2001	Invited speaker, Modelling 2001, Plzen, Czech Republic, *Iterative Substructuring for Coupled Fluid-Solid Acoustics*
May 2001	Fast Solvers for Partial Differential Equations, Oberwolfach (by invitation only), Germany, *Adaptive Aggregation in Algebraic Multigrid*
April 2001	Copper Mountain Conference on Multigrid Methods, *Approximation and Coupling Estimators for Algebraic Multigrid*
May 1999	Fast solution of differential equations, Oberwolfach, Germany (by invitation only), *Analysis of FETI substructuring methods*
August 1999	*Robust balancing domain decomposition* (with P. Krzyzanowski), International Conference on Computational Mechanics, Boulder, CO.
May 1999	8th Copper Mountain Conference on Multigrid Methods, *Fast Computation of Energy Minimal Coarse Basis Functions by Smoothing and Projection*
1994	SIAM Annual Meeeting, San Diego, *Iterative Methods for Thin p-Version Finite Elements*
1993	Invited speaker, 7th International Symposium on Domain Decomposition Methods, Penn State, *Domain Decomposition for Plates*
1993	MAFELAP'93, Brunel University, U.K., *Balancing domain decomposition*
1993	MAFELAP'93, Brunel University, U.K., *Iterative methods for high order elements*
1992	AMS-SIAM Summer Seminar "Eploiting Symmetry in Applied and Numerical Analysis," Fort Collins, CO, *An abstract theory for the domain reduction methods*
1992	Copper Mountain Conference on Iterative Methods, *Adaptive preconditioners*
1992	Sixth International Symposium on Domain Decomposition Methods, Como, Italy, *Domain Decomposition on Unstructured Domains*
1992	Second International Conference on Spectral and High-Order Methods, Monpellier, France, *An iterative solver for p-version finite elements in three dimensions*
1991	Invited Speaker, Miniconference on Domain Decomposition, Lexington, KY, *Balancing domain decomposition preconditioners*
1991	Invited Speaker, Summer Conference on Domain Decomposition, Lambrecht, Germany, *Adaptive iterative solvers by incomplete elimination*
1991	Fifth Copper Mountain Conference on Multigrid Methods, F*ast iterative solver for finite elements using incomplete elimination*
1991	MSC User's Conference, Los Angeles, March, *Fast iterative solver for finite elements using incomplete elimination*
1990	Copper Mountain Conference on Iterative Methods, *On Schur complement and block diagonal preconditioning*

1989 SIAM Annual Meeting, San Diego, *Iterative methods for the p-version finite element method*

1989 Invited Speaker, International Conference on Spectral and High Order Methods for partial Differential Equations, Como, Italy, *Iterative solvers by substructuring for the p-version finite element method*

1989 Third International Conference on Domain Decomposition methods, Houston, TX, *Domain decomposition preconditioning for the p-version finite element method*

1989 Fourth Copper Mountain Conference on Multigrid Methods, Copper Mountain, CO, *Two-Level domain decomposition preconditioning for the p-version finite element method in three dimensions*

1988 Invited speaker, Second International Conference on Domain Decomposition Methods, Los Angeles, *Iterative solution of elliptic equations with refinement: The two-level case*

1988 Finite Element Circus, University of Maryland, College Park, MD, *Parallel preconditioning for the p-version finite element method*

1987 Third Copper Mountain Conference on Multigrid Methods, *Fourier analysis of a multigrid method for 3D elasticity problems*

1987 Second Conference on Multigrid Methods, Oberwolfach, Germany (by invitation only), *A multigrid method for singular and eigenvalue problems*

1987 Finite Element Circus, Cornell University, *Multigrid methods for singular and eigenvalue problems*

1985 Invited speaker, 2nd Copper Mountain Conference on Multigrid Methods, *Multigrid convergence for nonsymmetric, indefinite variational problems and one smoothing step*

1985 Invited speaker, 2nd European Conference on Multigrid Methods, *On multigrid and iterative aggregation methods for nonsymmetric problems*

1984 Conference on Multigrid Methods, Oberwolfach, Germany (by invitation only), *Algebraic study of multigrid methods for symmetric, definite problems.*

1983 Workshop on Defect Correction Methods, Oberwolfach, Germany (by invitation only), *On some two-level iterative methods*

1982 XXI International Symposium on Mathematical Programming, Bonn, Germany, *On iterative methods for linear inequalities*

Colloquium Lectures

2013 Worcester Polytechnic Institute, Worcester, MA

2012 CERFACS, Toulouse, France; Universite Paul-Sabatier, Toulouse, France

2011 Department of Applied Mathematics, University of Colorado Boulder; Institute for Mathematics and Scientific Computing, Karl-Franzens University, Graz, Austria; Department of Statistics, Pennsylvania State University

2010 Max-Planck Institute, Leipzig, Germany

2009 Institute of Informatics of the Czech Academy of Sciences, Prague, Czech Republic, Department of Statistics, State University, Fort Collins, CO

2008 Czech Technical University, Czech Academy of Sciences, Prague, Czech Republic

2006 National Center for Atmospheric Research, Department of Mathematics, Colorado State University, Fort Collins, CO

2004 Technical University Ostrava, Czech Technical University Praha, Czech Republic

2003 University of Kentucky, Colorado Linux Users and Enthusiasts, University Colorado at Boulder

2002 Sandia National Laboratories, Albuquerque

2000 Department of Aerospace Engineering, University of Colorado at Boulder
1999 University of Wyoming
1996 Colorado School of Mines
1995 Colorado State University
1994 University of Wyoming
1993 Courant Institute, INRIA (Rocquencourt, France), West Bohemian University (Plzen, Czech Republic)
1992 Rice University, University of Texas at Austin
1990 Pennsylvania State University, Stanford University, IBM T.J. Watson Research Cenver, Colorado State University, Purdue University
1989 Courant Institute, University of Southern California
1988 University of Wyoming
1987 IBM TJ Watson Research Center, Courant Institute, Stanford University, Yale University, Oxford University
1986 University of Wisconsin-Madison

Awards

2010 University of Colorado Denver Campus Research Award (the only faculty member so far to win twice)
2007 Paper Mandel, Dohrmann, Tezaur, 2005, selected by ISI as the Fast Breaking Highly Cited paper in Mathematics and Statistics for June 2007
2002 College of Liberal Arts and Sciences Research Award
1992 University of Colorado at Denver Campus Research Award
1991 Honorable Mention - Technical paper, 1991 MacNeal-Schwendler Corporation World Users'Conference (paper selected by conference attendees)

Other Professional Activities

Society Membership

Society for Industrial and Applied Mathematics (SIAM)

Professional Service

2014 One NSF advisory panel
2013 One NSF advisory panel
2011 Two NSF advisory panels
2009 One NSF advisory panel
2008 Two NSF advisory panels
2007 Two NSF advisory panels
2006 One NSF advisory panel
2005 One NSF advisory panel, one DOE advisory panel
2004 Two NSF advisory panels, one DOE advisory panel
2003 Program Chair, Sixth IMACS International Symposium on Iterative Methods in Scientific Computing, Denver
2002 One NSF Advisory panel
2001 One NSF Advisory panel and one invited workshop
2000 Two NSF Advisory panels
1999 Two NSF Advisory panels
1998-2005 SIAM J. Numerical Analysis, member of editorial board.

1998 Co-chair, Tenth International Symposium on Domain Decomposition, Boulder, CO, August, Principal editor of proceedings.
1998 NSF advisory panel
1997 Three NSF advisory panels
1996 Two NSF advisory panels
1995 NSF advisory panel
1995 NSF advisory panel
1994 NSF advisory panel
1993 NSF advisory panel
1992-present Member of IMACS committee on Numerical Linear Algebra.
1991 Program Chair, Fifth Copper Mountain Conference on Multigrid Methods; guest editor of special issue of Communications in Applied Numerical Mathematics.
1991 Member of international program committee, IMACS International Symposium on Iterative Methods in Linear Algebra, Brussels, March 1991
1989 Co-chair, Fourth Copper Mountain Conference on Multigrid Methods, co-editor of proceedings
1987-2002 Program committee member, Copper Mountain Conferences on Multigrid Methods
1987 Program Chair, Third Copper Mountain Conference on Multigrid Methods, co-editor of Proceedings.
1987-1990 Chair of the Computational Mathematics Group Colloquium Series, University of Colorado at Denver.
1984-1986 Program Chair and Co-Organizer (with I. Marek, head of the Numerical Mathematics Department) of a monthly seminar on Multigrid Methods at Charles University, Prague.

Consultantships

1993 D. H. Brown Associates, Inc., Port Chester, NY, competitive analysis of parallel computers.
1988 Noetic Technologies Corp., St. Louis, MO, finite element methods.
1988 IBM Corporation, Research Division, NY, hybrid computing.
1984-1985 Project Optimization of Thermoelastic Systems, supported by Skoda Plzen Corp., Czechoslovakia (with J. Nečas and T. Roubicek).
1978 Research Institute of Education, Prague, Czechoslovakia, statistics.

Reviewer and Referee Service

Grant agencies: Reviewer for U.S. National Science Foundation, U.S. Department of Energy, British Research Council, European Research Council, European Commission FP7, Czech Grant Agency, Croatian Grant Agency. Member of proposal evaluation panels at the National Science Foundation and the Department of Energy.
Journals: Referee for Applied Mathematics and Computation, Journal of Optimization Theory and Applications, Applications of Mathematics, Journal of Computational Physics, Applied Numerical Mathematics, SIAM Journal on Numerical Analysis, Mathematics of Computation, International Journal for Numerical Methods in Engineering, Computer Methods in Applied Mathematics and Engineering, Computers & Mathematics with Applications, Numerical Partial Differential Equations, Simulation, Electronic Transactions in Numerical Analysis, Transactions on Modeling and Computer Simulation, Neurocoputing, International Journal of Wildland Fire, Journal of Fire Sciences, Q.J. Royal Meteorological Society, Fire Safety Journal, Mathematical Biosciences, Physica D, Signal Processing,
Reviewer for Mathematical Reviews and Zentralblatt für Mathematik.

Students Graduated

PhD

2012 Nina Dobrinkova (Bulgarian Academy of Sciences)
2011 Minjeong Kim
2009 Jonathan D. Beezley
2008, 2010 Bedrich Sousedik (UCD and Czech Technical University)
2002 Mirela Popa
1998 Radek Tezaur
1997 Marian Brezina
1990 G. Scott Lett

MS

2014 Evan Kwiatkowski
2010 Volodymyr Kondratenko
2009 Myung Joo Song
2005 Charles Glaze, Sumbal Jullion
2002 Gantulga Tsedendorj
1997 Abderrahman Seffriouri
1988 Victor Bandy, Joe Ottero

Contracts and Grants

2012-2015	*Data assimilation in scientific computing*, NSF DMS-1216481, $399,981, PI
2013-2014	*Daily Forecasts of Wildland Fire Impacts on Air quality in the Pacific Northwest: Enhancing the Air Indicator Report for Public Awareness and Community Tracking (AIRPACT) Decision Support,* $149,018, subcontract PI, $18,197 (NASA, with Washington State University, Steve Edburg, PI)
2013-2014	*Wildland Fire Behavior and Risk Prediction,* $163,022, subcontract PI, $50,703 (NASA, with Colorado State University, Sher Schranz, PI)
2013-2017	*Advanced random field methods in data assimilation for short-term weather prediction*, Grant Agency of the Czech Republic grant 13-34856S, CZK 8,000,000 (approx. $470,000), PI (at the Czech Academy of Sciences)
2009-2011	*Improved Tracking for Emerging Diseases from Climate Change*, NIH 1 RC1 LM010641-01, $613,030, Co-PI (Loren Cobb, PI)
2009	*TESLA S1070 GPU supercomputing server,* NVIDIA, equipment valued $4,300
2008-2012	*MRI-Consortium: Acquisition of a Supercomputer by the Front Range Computing Consortium,* NSF CNS-0821794, $2,796,500, Co-PI (with CU-Boulder and NCAR, Henry Tufo, PI)
2008-2013	*Collaborative Research: CDI-Type II-The Open Wildland Fire Modeling E-community: A Virtual Organization Accelerating Research, Education, and Fire Management Technology*, NSF EGS-0835579, $653,556, PI. Part of $1.6M group of collaborative grants with NCAR and University of Utah, Lead PI.
2008	*Continued Funding for the Wildland Fires Project, UCD CLAS CRISP, $13,123*
2007-2011	*Adaptive Multilevel Iterative Substructuring Methods,* NSF DMS-0713876, $209,965, PI
2007-2009	*CSR-CSI: Collaborative Research: Dynamic Sensor/Computation Network for Wildfire Management,* NSF CNS-0719641, $99,999, PI. Part of collaborative group of grants with University of Kentucky and RPI, Craig Douglas, Lead PI.

2007-2008 *Data Assimilation in Atmospheric Sciences,* PI, NSF DMS-0623983, $99,965.

2004-2005 *Adaptive Strategies for the Salinas FETI-DP Solver* (renewal), PI, Sandia National Laboratories, $48,961.

2004-2007 *Acquisition of an IBM BlueGene/L Supercomputer,* CU-Denver PI, NSF, $119,332. Part of $1.5M group of collaborative grants with CU-Boulder and NCAR.

2003-2004 *Adaptive Strategies for the Salinas FETI-DP Solver* (renewal), PI, Sandia National Laboratories, $49,999.

2003-2008 *Data Dynamic Simulation for Disaster Management* (with Leo Franca and Tolya Puhalskii, UCD; Janice Coen, NCAR; Craig Douglas, University of Kentucky; Tony Vodacek and Bob Kremmens, Rochester Institute of Technology; and Wei Zhao, Texas A&M), lead PI, NSF ITR grant, $2,064,000. UCD part NSF ITR 0325314, $621,001.

2003 *Adaptive Strategies for the Salinas FETI-DP Solver*, PI, Sandia National Laboratories, $39,893.

2000–2001 *Acquisition of a High-Performance Parallel Computer for Mathematical Sciences and Applications*, NSF DMS-0079719 Co-PI (Andrew Knyazev, PI), $100,000.

2000-2004 *Scalable Submesh Computing,* NSF DMS-0074278, PI, $155,000.

1997–2001 *High Performance simulation of Multiphysics Problems* (CO-PI and subcontract PI; Carlos Felippa, CU-Boulder PI), NSF ECS-9725504, $312,000.

1998–2001 *Sensitivity Analysis Of Coupled Acoustic Problems to Structural Boundary Conditions and Efficient Numerical Solution Algorithms*, Co-PI (at CU-Boulder, Charbel Farhat, PI), ONR N-00014-95-1-0663, $320,000.

1995-1998 *Sensitivity Analysis Of Coupled Acoustic Problems to Structural Boundary Conditions and Efficient Numerical Solution Algorithms,* (with Charbel Farhat, CU-Boulder), subcontract PI, 3 years, $161,000, ONR grant N-00014-95-1-0663

1995-1996 *Mathematical Sciences Computing Research Environments,* NSF DMS-9508328, with T. Russell, L. Franca, A. Knyazev, C. Liu, $50,000.

1994-1996 *Artificial Intelligence in Numerical Computing* – CISE Postdoctoral Research Associateship for S. Ghosal, Co-PI with Harvey Greenberg, NSF Grant ASC-9404734, $42,000.

1994 *Advanced Iterative Solvers for High Order Finite Elements,* NSF Grant SBIR DMI-9360015, at Solvers International, Inc., PI, $64,857.

1993-1996 *Parallel Methods for Large-Scale Computations,* NSF Grant ASC-9121431, PI, $240,595.

1992-1997 *GAFD Turbulence and Coupled Fields,* NSF grant no. ASC-9217394 (Grand Challenge, through CU Boulder), subcontract PI , $312,500. Carlos Felippa, PI.

1991 *Fast Iterative Solvers for MSC/EMAS,* MacNeal-Schwendler Corporation, PI, $50,000

1990-1993 *Multilevel Algorithms for Advanced Computers,* NSF grant no. DMS-9015259, $240,000 (with S. McCormick, T. Manteuffel, and T. Russell)

1989 *Computational Mathematics Group Local Area Network,* NSF SCREMS, $42,000 (with S. McCormick and T. Manteuffel).

1989 *Junior Faculty Development Award,* University of Colorado at Denver, $4,500.

1988 *Fourth Copper Mountain Conference on Multigrid Methods,* US Air Force AFOSR-89-0224, $26,885 (with S. McCormick).

1987-1990 *Multilevel Algorithms for Advanced Computers,* NSF DMS-8704169, $560,000 (with S. McCormick and T. Manteuffel)