

Vanka, Surya Pratap

Research Professor, Professor Emeritus of Mechanical Engineering University of Illinois at Urbana-Champaign, Urbana, IL. Tel: 217-244-8388, email: spvanka@illinois.edu

Expertise

Fluid Mechanics, Heat Transfer, Combustion, Multiphase Flow and Numerical Computations

Education

MBA, University of Chicago, 1985 Ph.D., Imperial College, London, 1975 M.Tech (Engg), Indian Institute of Technology, Kanpur, 1970 BSc (Engg) (Honors), Banaras Hindu University, India, 1968

Professional Societies

Associate Fellow, American Institute of Aeronautics and Astronautics

Fellow, American Society of Mechanical Engineers

Editorial Board, Journal of Numerical Heat Transfer, 1998-date

Associate Editor ASME J. Fluids Engineering,

Associate Editor ASME, Journal of Heat Transfer

Professional Experience

23 years as Associate and Full Professor of Mechanical Engineering, UIUC (1989-2012) 10 years as Scientist, Argonne National Laboratory, (1979-1988) 1 year as Senior Engineer, Energy Inc., Idaho Falls, ID, (1978-79) 2 years as Group Leader, CHAM Ltd., UK, (1975-77)

3 years as Research Assistant, Imperial College, London, (1972-75) TEACHING: Taught courses on

Fluid Mechanics, Heat Transfer, Thermodynamics, Numerical methods, Finite Element Methods
Materials Processing Senior Design

Awards

Excellence in Teaching of Courses in Heat Transfer, Numerical methods in Thermal Science, Advanced Computational Fluid Dynamics. Excellence in Advising Award. Robert Hunt Best paper Award by Iron and Steel Institute, 2004.

Bhatnagar Memorial Lecture, Indian Society of Theoretical and applied mechanics, 2008. Visiting Professor, IIT-Hyderabad, May-Aug. 2010, 2011 ASME Freeman Scholar, 2012

Books (including chapters in books)

- Vanka, S. P. and G. Wang, "Multigrid Methods for Internal Flows and Heat Transfer,"

Advances in Numerical Heat Transfer, Chapter 7., E. M. Sparrow and W. J. Minkowycz (eds.), Taylor & Francis, Washington, D.C., 241-286, 1997.

Articles in Journals

1. Patankar, S. V., V. S. Prapat, and D. B. Spalding, "Prediction of Laminar Flow and Heat Transfer in Helically-Coiled Pipes," *Journal of Fluid Mechanics*, 62:3, 539-551, 1974.
2. Patankar, S. V., V. S. Prapat, and D. B. Spalding, "Prediction of Turbulent Flow in Curved Pipes," *Journal of Fluid Mechanics*, 67:3, 583-595, 1975.
3. Prapat, V. S. and D. B. Spalding, "Numerical Computations of Flow in Curved Ducts," *The Aeronautical Quarterly*, 26:3, 219-228, 1975.
4. Prapat, V. S. and D. B. Spalding, "Fluid Flow and Heat Transfer in Three-Dimensional Duct Flows," *International Journal of Heat and Mass Transfer*, 19, 1183-1188, 1976.
5. Majumder, A. K., V. S. Prapat, and D. B. Spalding, "Numerical Computation of Flow in Rotating Ducts," *ASME Journal of Fluids Engineering*, 99:10, 148-153, 1977.
6. S. P. Vanka, Chen, B. C-J., and W. T. Sha, "Some Recent Computations of Rod Bundle Thermal Hydraulics Using Boundary Fitted Coordinates," *Nuclear Engineering and Design*, 62, 123-135, 1980.
7. Vanka, S. P., B. C-J. Chen, and W. T. Sha, "A Semi-Implicit Calculation Procedure for Flows Described in Boundary-Fitted Coordinate Systems," *Numerical Heat Transfer*, 3, 1-19, 1980.
8. Vanka, S. P. and R. K. Ahluwalia, "Three-Dimensional Flow and Heat Transfer Development in Magnetohydrodynamic Channels," *J. Energy*, 6:3, 218-224, 1982.
9. Ahluwalia, R. K., S. P. Vanka, K. H. Im, and S. A. Zwick, "Formulation and Assessment of a Cross-Plane Electrical Model for Magnetohydrodynamic Channels," *J. Energy*, 6:5, 314-322, 1982.
10. Vanka, S. P. and R. K. Ahluwalia, "Coupled Three-Dimensional Flow and Electrical Calculations for Faraday MHD Generators," *J. Energy*, 7:1, 65-72, 1983.
11. Ahluwalia, R. K. and S. P. Vanka, "Secondary Flow Effects in Diagonal MHD Channels," *J. Energy*, 7:5, 387-388, 1983.
12. Stull, F. D., R. R. Craig, G. D. Streby, and S. P. Vanka, "Investigation of Dual Inlet Side Dump Combustor Using Liquid Fuel Injection," *Journal of Propulsion of Power*, 1:1, 83-88, 1985.
13. Vanka, S. P., "Block-Implicit Calculation of Steady Turbulent Recirculating Flows," *International Journal of Heat and Mass Transfer*, 28:11, 2093-2103, 1985.
14. Vanka, S. P., "Block-Implicit Calculations of Three-Dimensional Laminar Flow in Strongly Curved Ducts," *AIAA Journal*, 23:12, 1989-1991, 1985.
15. Vanka, S. P., "Calculation of Axisymmetric Turbulent Confined Diffusion Flames," *AIAA Journal*, 24:3, 462-469, 1986.
16. Vanka, S. P., "Block-Implicit Multigrid Solution of Navier Stokes Equations in Primitive Variables," *J. Comp. Physics*, 65:1, 138-158, 1986.
17. Vanka, S. P., "A Calculation Procedure for Three-Dimensional Steady Recirculating Flows Using Multigrid Methods," *Computer Methods in Applied Mechanics and Engineering*, 55, 321-338, 1986.
18. Vanka, S. P., R. R. Craig, and F. D. Stull, "Mixing, Chemical Reaction, and Flowfield Development in Ducted Rockets," *J. Propulsion and Power*, 2:4, 331-338, 1986.
19. Vanka, S. P., "Performance of a Multigrid Calculation Procedure in Three-Dimensional Sudden Expansion Flows," *International Journal of Numerical Methods in Fluids*, 6, 459-477, 1986.
20. Vanka, S. P., "Block-Implicit Multigrid Calculation of Two-Dimensional Recirculating Flows," *Computer Methods in Applied Mechanics and Engineering*, 59, 29-48, 1986.
21. Vanka, S. P., "Second-Order Upwind Differencing in a Recirculating Flow," *AIAA Journal*,

- 25:11, 1435-1441, 1987.
22. Vanka, S. P. and K. P. Misegades, "Vectorized Multigrid Fluid Flow Calculations on a CRAY X-MP/48," *International Journal for Numerical Methods in Fluids*, 7, 635-648, 1987.
 23. Thompson, C. P., G. K. Leaf, and S. P. Vanka, "Application of a Multigrid Method to a Buoyancy-Induced Flow Problem," *Multigrid Methods, Theory, Applications and Supercomputing*, S. F. McCormick, ed., Marcel Decker, 605-629, 1988.
 24. Vanka, S. P., J. L. Krazinski, and A. S. Nejad, "Efficient Computational Tool for Ramjet Combustor Research," *AIAA J. Propulsion and Power*, 5:4, 431-437, 1989.
 25. Karki, K. C., S. P. Vanka, and H. C. Mongia, "Fluid Flow Calculations Using a Multigrid Method and an Improved Discretization Scheme," *Numerical Heat Transfer, Part B*, 16:2, 143-159, 1989.
 26. Nejad, A-S., S. C. Favalovo, S. P. Vanka, M. Samimy, and C. Langenfeld, "Application of Laser Velocimetry for Characterization of Confined Swirling Flow," *Journal of Engineering for Gas Turbines and Power*, 111:1, 36-45, 1989.
 27. Darr, J. H. and S. P. Vanka, "Separated Flow in a Driven Trapezoidal Cavity," *Physics of Fluids*, 3:3, 385-392, 1991.
 28. Tafti, D. K. and S. P. Vanka, "A Numerical Study of the Effects of Spanwise Rotation on Turbulent Channel Flow," *Physics of Fluids*, 3:4, 642-656, 1991.
 29. Vanka, S. P., "Fast Numerical Computation of Viscous Flow in a Cube," *Numerical Heat Transfer, Part B*, 2:20, 255-261, 1991.
 30. Tafti, D. K. and S. P. Vanka, "Hot Gas Environment Around STOVL Aircraft in Ground Proximity Part 2, Numerical Study," *AIAA Journal of Aircraft*, 29:1, 20-27, 1991.
 31. Joshi, D. S. and S. P. Vanka, "Multigrid Calculation Procedure for Internal Flows in Complex Geometries," *Numerical Heat Transfer, Part B*, 20, 61-80, 1991; also presented at the AIAA Aerospace Sciences Meeting, Reno, NV, AIAA 90-0442, 1990.
 32. Tafti, D. K. and S. P. Vanka, "A Numerical Study of Flow Separation and Reattachment on a Blunt Plate," *Physics of Fluids*, 3:7, 1749-1759, 1991.
 33. Madabhushi, R. K. and S. P. Vanka, "Large Eddy Simulation of Turbulence-Driven Secondary Flow in a Square Duct," *Physics of Fluids*, 3:11, 2734-2745, 1991.
 34. Tafti, D. K. and S. P. Vanka, "A Three-Dimensional Numerical Study of Flow Separation and Reattachment on a Blunt Plate," *Physics of Fluids*, 3:12, 2887-2909, 1991.
 35. Krazinski, J. L., S. P. Vanka, J. A. Pearce, and W. M. Roquemore, "A Computational Fluid Dynamics and Chemistry Model for Jet Fuel Thermal Stability," *Journal of Engineering for Gas Turbines and Power*, 114, 104-110, 1992; also presented at the 35th ASME International Gas Turbine and Aeroengine Congress, Brussels, Belgium, June 11-14, 1990.
 36. Claus, R. W. and S. P. Vanka, "Multigrid Calculations of Jet in a Cross-flow," *Journal of Propulsion and Power*, 8:2, 425-431, 1992; also presented at the AIAA Aerospace Sciences Meeting, Reno, NV, AIAA 90-0444, 1990.
 37. Robichaux, J., D. K. Tafti, and S. P. Vanka, "Large Eddy Simulations of Turbulence on the CM-2," *Numerical Heat Transfer B*, 21, 367-388, 1992.
 38. Madabhushi, R. K., S. Balachandar, and S. P. Vanka, "A Divergence-Free Chebyshev Collocation Procedure for Incompressible Flows with Two Non-periodic Directions," *Journal of Computational Physics*, 105:2, 199-206, 1993.
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41. Gursoy, A., L. V. Kale, and S. P. Vanka, "Unsteady Fluid Flow Calculations Using a Machine Independent Parallel Programming Environment," *Parallel Computational Fluid Dynamics*, '92, North Holland Publishers, 175-185, 1993.
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 43. Wang, M. and S. P. Vanka, "A Parallel ADI Algorithm for High Order Finite Difference Solution of the Unsteady Heat Conduction Equation, and its Implementation on the CM-5," *Numerical Heat Transfer*, 24, 143-160, 1993.
 44. Fricker, D. M., J. D. Holdeman, and S. P. Vanka, "Calculations of Hot Gas Ingestion for a STOVL Aircraft Model," *Journal of Aircraft*, 31:1, 236-242, 1994; also presented at the 30th Aerospace Sciences Meeting and Exhibit, Reno, NV, AIAA-92-0385, Jan. 6-9, 1992.
 45. Najjar, F. M. and S. P. Vanka, "Simulations of the Unsteady Separated Flow Past a Normal Flat Plate," *International Journal for Numerical Methods in Fluids*, 21, 525-547, 1995.
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 47. Najjar, F. M. and S. P. Vanka, "Effects of Intrinsic Three-Dimensionality on the Drag Characteristics of a Normal Flat Plate," *Physics of Fluids*, Brief Communication, 7:10, 2516-2518, 1995.
 48. Jyotsna, R. and S. P. Vanka, "Multigrid Calculation of Steady, Viscous Flow in a Triangular Cavity," *Journal of Computational Physics*, 122, 107-117, 1995.
 49. Völker, S., T. Burton, and S. P. Vanka, "Finite Volume Multigrid Calculation of Natural Convection Flows on Unstructured Grids," *Numerical Heat Transfer*, 30:1, 1-22, 1996.
 50. Wang, G., K. Stone, and S. P. Vanka, "Unsteady Heat Transfer in Baffled Channels," *Journal of Heat Transfer*, 118:3, 585-591, 1996.
 51. Robichaux, J. H., S. Balachandar, and S. P. Vanka, "Three-Dimensional Instability of the Wake of Square Cylinder," *Physics of Fluids*, 11:3, 560, 1999.
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 53. Stone, K. and S. P. Vanka, "Numerical Study of Developing Flow and Heat Transfer in a Wavy Passage," *Journal of Fluids Engineering*, 121, 713-719, 1999.
 54. Thomas, B. G., Q. Yuan, S. Sivaramakrishnan, T. Shi, S. P. Vanka, and M. B. Assar, "Comparison of Four Methods to Evaluate Fluid Velocities in a Continuous Slab Casting Mold," *ISIJ International*, 41:10, 1262-1271, 2001.
 55. Mukhopadhyay, A., P. Venugopal, and S. P. Vanka, "Oblique Vortex Shedding from a Circular Cylinder in Linear Shear Flow," *Computers and Fluids*, 31, 1-24, 2002.
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 57. Rani, S. L., C. M. Winkler, and S. P. Vanka, "A New Algorithm for Computing Binary Collisions in Dispersed Two-Phase Flows," *Numerical Heat Transfer Part B-Fundamentals*, 45:1, 99-107, 2004.
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 59. Vanka, S. P., G. Luo, and N. G. Glumac, "Numerical Study of Mixed Convection Flow in an Impinging Jet CVD Reactor for Atmospheric Pressure of Thin Films," *J. Heat Transfer*, 126:5, 764-775, 2004.

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61. Vanka, S. P., G. Luo, and C. M. Winkler, "Numerical Study of Scalar Mixing in Curved Channels at Low Reynolds Numbers," *AIChE Journal*, 50:10, 2359-2368, 2004.
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64. Yuan, Q., S. Sivaramakrishnan, S. P. Vanka, and B. G. Thomas, "Computational and Experimental Study of Turbulent Flow in a 0.4-Scale Water Model of a Continuous Steel Caster," *Metallurgical and Materials Transactions B: Process Metallurgy and Materials Processing Science*, 35:5, 967-982, 2004.
65. Rani, S. L., C. M. Winkler, S. P. Vanka, "Numerical Simulations of Turbulence Modulation by Dense Particles in a Fully Developed Pipe Flow," *J. Powder Technology*, 141:1-2, 80-99, 2004.
66. Yuan, Q., B. Zhao, S. P. Vanka, and B. G. Thomas, "Study of Computational Issues in Simulation of Transient Flow in Continuous Casting," *Steel Research International*, 76:1, 33-43, 2005.
67. Zhao, B., S. P. Vanka, and B. G. Thomas, "Numerical Study of Flow and Heat Transfer in a Molten Flux Layer," *International J. Heat and Fluid Flow*, 26:1, 105-118, 2005.
68. Zhao, B., B. G. Thomas, S. P. Vanka, and R. J. O'Malley, "Transient Flow and Temperature Transport in Continuous Casting of Steel Slabs," *ASME Journal Heat Transfer*, 127, 807, 2005.
69. Zhao, B., B. G. Thomas, S. P. Vanka, and R. J. O'Malley, "Transient Fluid Flow and Superheat Transport in Continuous Casting of Steel Slabs," *Metallurgical and Materials Transactions B*, 36B:12, 801-823, Dec. 2005.
70. Shankar, N., M.-F. Yu, S. P. Vanka, and N. G. Glumac, "Synthesis of Tungsten Oxide (WO₃) Nanorods Using Carbon Nanotubes as Templates by Hot Filament Chemical Vapor Deposition," *Materials Letters*, 60, 771-774, 2006.
71. Thomas, B. G., Q. Yuan, B. Zhao, and S. P. Vanka, "Transient Fluid-Flow Phenomena in the Continuous Steel-Slab Casting Mold and Defect Formation," *JOMe*, (Journal of Metals – electronic edition), December 2006, www.tms.org/jom.html (<http://www.tms.org/pubs/journals/JOM/0612/Thomas/Thomas-0612.html>)
72. Shankar, N., N. G. Glumac, M. F. Yu, and S. P. Vanka, "Growth of Nanodiamond/Carbon-Nanotube Composites with Hot Filament Chemical Vapor Deposition," *Diamond and Related Materials*, 17, 79-83, 2008.
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75. Chaudhary, R., S. P. Vanka, and B. G. Thomas, "Direct Numerical Simulations of Magnetic Field Effects on Turbulent Flow in a Square Duct," *Phys. Fluids*, Vol. 22, n. 7, p. 1-15, July 2010.
76. Sahu K. and S. P. Vanka, "A Multiphase Lattice Boltzmann Study of Buoyancy-Induced Mixing in a Tilted Channel," *Computers and Fluids*, v 50, n 1, p 199-215, Nov. 2011.

77. Chaudhary, R., A. F. Shinn, S. P. Vanka, and B. G. Thomas, "Direct Numerical Simulations of Transverse and Spanwise Magnetic Field effects on Turbulent Flow in a 2:1 Aspect Ratio Rectangular Duct," *Computers and Fluids*, v 51, n 1, p 100-114, 15 December 2011.
78. Chaudhary, R., C. Ji, B. G. Thomas, S. P. Vanka, "Transient Turbulent Flow in a Liquid-Metal Model of Continuous Casting, Including Comparison of Six Different Methods," *Metallurgical and Materials Transactions B: Process Metallurgy and Materials Processing Science*, v 42, n 5, p 987-1007, October 2011.
79. Tiwari, A. and S. P. Vanka, "A Ghost Fluid Lattice Boltzmann Method for Complex Geometries," *Int. J. Numerical Methods in Fluids, International Journal for Numerical Methods in Fluids*, v 69, n 2, p 481-98, 20 May 2012.
80. Chaudhary, R., B. G. Thomas and S. P. Vanka, "Effect of Electromagnetic Ruler Braking (EMBr) on Transient Turbulent Flow in Continuous Slab Casting using Large Eddy Simulations," *Metallurgical and Materials Transactions B*, v 43, n 3, p 532-53, June 2012.
81. Redapangu, P. R., S. P. Vanka, and K. C. Sahu, "Multiphase lattice Boltzmann simulations of buoyancy-induced flow of two immiscible fluids with different viscosities, *European Journal of Mechanics, B/Fluids*, v 34, p 105-114, July-August 2012.
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83. Shinn, A. F. and S. P. Vanka, "Large Eddy Simulations of Film-Cooling Flows with a Micro-Ramp Vortex Generator," *Journal of Turbomachinery*, v 135, n 1, p 011004 (13 pp.), Jan. 2013.
84. Vanka, S. P., "2012 Freeman Scholar Lecture: Computational Fluid Dynamics on Graphics Processing Units," *J. Fluids Eng.* 135(6), 2013.
85. Redapangu, P. R., K. C. Sahu and S. P. Vanka, "A lattice Boltzmann simulation of three-dimensional displacement flow of two immiscible liquids in a square duct," *J FLUID ENG - T ASME*, 2013, 135, 121202. doi:10.1115/1.4024998
86. Singh, R., B.G. Thomas, and P. Vanka, "Effects of a Magnetic Field on Turbulent Flow in the Mold Region of a Steel Caster," *Metallurgical and Materials Transactions B*, p. 1-21, 2013.
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89. Liu, R., S. P. Vanka, and B. G. Thomas, "Particle Transport and Deposition in a Turbulent Square Duct Flow with an Imposed Magnetic Field," *Journal of Fluids Engineering, Transactions of the ASME*, v 136, n 12, December 1, 2014.
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Newtonian Fluids," submitted to Journal of Non-Newtonian Fluid Mechanics, May 2015.

95. Jin, K., S. Vanka, R. K. Agarwal, and B. G. Thomas, "GPU Accelerated Simulations of Three-Dimensional Flow of Power-law Fluids in a Driven Cube," submitted to ASME Journal of Fluids Engineering, Feb. 2015.

Conference Articles

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2. Moulton, A., V. S. Pratap, and D. B. Spalding, "Calculation of Steady, Two-Dimensional Two-Phase Flow and Heat Transfer in a Steam Generator," Numerical Modeling of Laminar and Turbulent Flows, Swansea, 443, 1978.
3. W. T. Sha, Chen, B. C-J., Y. S. Cha, S. P. Vanka, R.C. Schmitt, J. F. Thompson and J. F. Doria, "Benchmark Rod-Bundle Thermal Hydraulic Analysis," Transactions American Nuclear Society, 33, 333-335, 1979.
4. Chen, B. C-J., S. P. Vanka, and W. T. Sha, "A Simple Anisotropic Turbulence Model for Flow in Rod Bundles," Transactions of Nuclear Society, 34, 879-880, 1980.
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6. Ahluwalia, R. K. and S. P. Vanka, "Flow Field Development in MHD Diffusers," 20th Symposium on Engineering Aspects of Magneto Hydrodynamics, June 14-16, 1982.
7. Vanka, S. P., F. D. Stull, and R. R. Craig, "Analytical Characterization of Flow Fields in Side-Inlet Dump Combustors," AIAA/ASME Joint Propulsion Conference, Seattle, WA, AIAA-83-1299, June 1983.
8. Vanka, S. P. and G. K. Leaf, "An Efficient Finite-Difference Calculation Procedure for Multidimensional Fluid Flows," 20th Joint Propulsion Conference, Cincinnati, OH, AIAA-84-1244, June 1984.
9. Vanka, S. P., "Block-Implicit Multigrid Calculation of Three-Dimensional Recirculating Flows," 4th International Conference on Numerical Methods in Thermal Problems, University of Wales, Swansea, UK, 1985.
10. Vanka, S. P., "Block-Implicit Coupled Calculation of Fluid Flows," 5th Symposium on Turbulent Shear Flows, Cornell University, Ithaca, 1985.
11. Vanka, S. P., "Block-Implicit Computation of Viscous Internal Flows--Recent Results," 25th Aerospace Sciences Meeting, Reno, NV, AIAA-87-0058, Jan. 12-15, 1987.
12. Samimy, M., A. S. Nejad, C. A. Langefeld, R. R. Craig, and S. P. Vanka, "Isothermal Swirling Flow in a Dump Combustor," AIAA 19th Fluid Dynamics, Plasma Dynamics and Laser Conference, Honolulu, HI, AIAA-87-1352, June 8-10, 1987.
13. Vanka, S. P., "Use of Direct Solvers for Multidimensional Fluid Flow Calculations," invited talk at ICES-88, Atlanta, GA, April 1988.
14. Vanka, S. P., "Multigrid Calculation of Practical Fluid Flows and Heat Transfer," invited talk at ICES-88, Atlanta, GA, April 1988.
15. Bouillard, J., J. Krazinski, S. P. Vanka, and G. F. Berry, "Performance of a Multigrid 3-D MHD Generator Calculation Procedure," 27th Symposium of Engineering Aspects of Magnetohydrodynamics, Reno, NV, 5.2-1-5.2-11, June 27-29, 1989.
16. Favaloro, F., A. Nejad, S. Ahamed, T. Miller, and S. P. Vanka, "An Experimental Swirling Flow in an Axisymmetric Dump Combustor," 27th Aerospace Sciences Meeting, Reno, NV, AIAA-89-0620, Jan. 1989.
17. Roquemore, W. M., J. A. Pearce, W. E. Harrison, J. L. Krazinski, and S. P. Vanka, "Fouling in Jet Fuels: A New Approach," Symposium on the Structure of Future Jet Fuels II at the 198th National American Chemical Society Conference, Miami Beach, FL, 841-849, Sept. 10-15,

1989.

18. Pegues, W. and S. P. Vanka, "Numerical Study of Twin Jet Fountain Upwash Flow," 1990 ASME Fluids Engineering Conference, Forum on Turbulent Flows, Toronto, Canada, FED-Vol. 94, 97-103, June 1990.
19. Smith, K. M. and S. P. Vanka, "Multigrid Calculation of Internal Flows in Complex Geometries," 30th Aerospace Sciences Meeting and Exhibit, Reno, NV, AIAA-92-0096, Jan. 6-9, 1992.
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68. Surya P Vanka, E. C. Burdette, G. Ghoshal "Fast Numerical Simulations of Thermal Rherapy for Acoustic Ablation of Cancerous Tumors", Computational Heat Transfer-15, Rutgers University, NJ, May, 24-29, 2015

Selected Invited Lectures

1. "Three-Dimensional Vortex Shedding from Circular Cylinders in Shear Flows" University of Cincinnati, Cincinnati, OH, Jan. 1999.
2. "Large Eddy Simulations of Turbulence and Inclusion Transport in Continuous Casting of Steel," LIMSI/University of Paris-Sud., July 30, 2002.
3. "Meshless Methods for Incompressible Flows," LIMSI/University of Paris-Sud, July 31, 2002.
4. "Numerical Study of Low Reynolds number Mixing in Curved Channels," University of Surrey, UK, Jan. 27, 2003.
5. "Large Eddy Simulations of Turbulence and Inclusion Transport in Continuous Casting of Steel," IIT Kanpur, India, Feb. 3, 2003.
6. "Numerical Study of Buoyancy Induced Flows in CVD Reactors," ARTI (Department of Science and Technology Lab), Hyderabad, India, Feb. 13, 2003.
7. "Meshless Methods for Incompressible Flows," Jawaharlal Nehru Center for Advanced Scientific Research, Bangalore, India, Mar. 12, 2003.
8. "Numerical Study of Low Reynolds Number Mixing in Curved Channels," Jawaharlal Nehru Center for Advanced Scientific Research, Bangalore, India, Mar. 20, 2003.
9. "Meshless Methods for Incompressible Flows," CFD Center, Indian Institute of Science, Bangalore, India, Mar. 21, 2003.
10. "Numerical Study of Buoyancy Induced Flows in CVD Reactors," Indian Institute of Science, Bangalore, India, Apr. 4, 2003.
11. "Computational Fluid Dynamics on the GPU," Los Alamos National Laboratory, Nov. 11, 2009
12. "Computational Fluid Dynamics on the GPU," Sandia National Laboratory, Nov. 12, 2009
13. "Challenges and Opportunities in Computational Fluid Dynamics," Challenge Lecture, IIT-Hyderabad, August, 2010

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5. Vanka, S. P., "Computations of Turbulent Recirculating Flows with Fully Coupled Solution of Momentum and Continuity Equations," ANL-83-74, Aug. 1983.
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11. Winkler, C. M. and S. P. Vanka, "Turbulent Particle Dispersion in a Square Duct," Bulletin American Physical Society, Abstract FA-4, DFD, 2001.