

Inaugural Talk

Feng, K.: Symplectic Geometry and Numerical Methods in Fluid Dynamics..... 1

Invited Lectures

Dymnikov, V.P.: On Some Problems of Dynamic Meteorology 8
Hussaini, M. Y.: Some Recent Developments in Spectral Methods 18
Kutler, P.: A Perspective of Computational Fluid Dynamics 30
Napolitano, M.: Simulation of Compressible Inviscid Flows: The Italian Contribution 47
Satofuka, N.: Method of Lines Approach to the Numerical Solution of Fluid Dynamic Equations 57
Zhuang, F.G. and Zhang, H.X.: On a Marching Iteration Method in Solving Gas Dynamic Equations 70

Contributed Papers

Aki, T.: Computation of Unsteady Shock Wave Motion by the Modified Flux TVD Scheme 86
Armfield, S.W. and Fletcher, C.A.J.: Swirling Diffuser Flow Using a Reduced Navier-Stokes Formulation 91
Azmy, Y.Y. and Dorning, J.J.: Numerical Studies of Bifurcations in the Confined Benard Problem..... 96
Bardos, C.: Diffusion and Rosseland Approximation Property of the Boundary Layer.....105
Barton, J.M. and Yoon, S.K.: Finite Difference Solution of the 3-D Euler Equations Using a Multistage Runge-Kutta Method.....108
Bassi, F., Grasso, F. and Savini, M.: Solution of the Compressible Navier-Stokes Equations by Using Embedded Adaptive Meshes.....113
Bercovier, M. and Engelman, M.: Simulation of Large Incompressible Flows by the Finite Element Method.....120
Bramley, J.S. and Sloan, D.M.: A Downstream Boundary Condition for the Numerical Solution of Viscous Flow.....123
Browning, G.L. and Kreiss, H. O.: Scaling and Computation of Smooth Atmospheric Motions.....128
Bruneau, C.H., Chattot, J.J., Laminie, J. and Temam, R.: Computation of Vortex Flows past a Flat Plate at High Angle of Attack.....134
Bullister, E.T., Cartage, T., Deville, M. and Patera, A.T.: Spectral Simulation of Thermal Convection in Complex Geometries.....141

VIII

Carter, J.E., Davis, R.L., Edwards, D.E. and Hafez, M.M.: Three-Dimensional Separated Viscous Flow Analyses	147
Chang, J.L.C., Yang, R.-J. and Kwak, D.: A Full Navier-Stokes Simulation of Complex Internal Flows.....	154
Chen, Y.W., Zhang, Y.K., Shen, M.Y. and Huang, D.T.: A Strong Inviscid-Viscous Interaction Solution of a Plane Transonic Cascade Flow.....	161
Cheng, S.-I.: Computation of Turbulent Spot Evolution.....	165
Choi, Y.-H. and Merkle, C.L.: Computation of Low Mach Number Flows with Buoyancy.....	169
Choudhury, S. and Nicolaides, R.A.: Vortex Multipole Methods for Viscous Incompressible Flows.....	174
Clark, R.A.: Free-Lagrangian Hydrodynamics Using Massless Tracer Points.....	181
Coakley, T.J.: Impact of Turbulence Modeling on Numerical Accuracy and Efficiency of Compressible Flow Simulations.....	186
Couët, B., Strumolo, G.S. and Dukler, A.E.: Numerical Modelling of a Bubble Rising Through Viscous Fluid.....	192
Cuyvelier, C. and Driessen, J.M.: Thermocapillary Free Boundaries in Crystal Growth.....	197
Dadone, A.: A Quasi-Conservative COIN Lambda Formulation.....	200
Daiguji, H., Motohashi, Y. and Yamamoto, S.: An Implicit Time-Marching Method for Solving the 3-D Compressible Euler Equations...	205
Dang, K. and Morchoisne, Y.F.: Large Eddy Simulation of a Narrow Source of Passive Scalar in Homogeneous Strained Turbulence.....	211
Deconinck, H., Hirsch, Ch. and Peuteman, J.: Characteristic Decomposition Methods for the Multi-Dimensional Euler Equations.....	216
Dennis, S.C.R. and Wing, Q.: Generalized Finite Differences for Operators of Navier-Stokes Type.....	222
Dinh, Q.V., Periaux, J., Terrasson, G. and Glowinski, R.: On the Coupling of Incompressible Viscous Flows and Incompressible Potential Flows via Domain Decomposition.....	229
Dong, S.S., Wang, Z.X. and Lee, H.: Free Mass-Lump Method for Two-Dimensional Compressible Flow.....	235
Drummond, J. P.: Spectral Methods for Modeling Chemically Reacting Flow Fields.....	242
Dwyer, H.S., Soliman, M. and Hafez, M.: Time Accurate Solutions of the Navier-Stokes Equations for Reacting Flows.....	247
Eguchi, Y. and Fuchs, L.: A Finite Element Method for Simulation of Unsteady Flows.....	252
Eiseman, P.R.: Alternating Direction Adaptive Grid Generation for Three-Dimensional Regions.....	258

IX

Erlebacher, G.: Transition Phenomena over a Flat Plate for Compressible Flows.....	264
Favini, B. and Zannetti, L.: On Conservative Properties and Non-Conservative Forms of Euler Solvers.....	270
Förster, K. and Li, F.W.: A Numerical Scheme for the Unsteady Transonic Flow Around an Oscillating Airfoil.....	276
Fromm, J.E.: Free Surface Calculation of Capillary Spreading.....	283
Fuchs, L.: A Combined Numerical Scheme for Transonic Flows.....	290
Hamakiotes, C.C. and Berger, S.A.: Fully Developed Pulsatile Flow in a Curved Pipe.....	297
Hartwich, P.-M., Hsu, C.-H. and Liu, C.-H.: Implicit Hybrid Schemes for the Flux-Difference Split, Three-Dimensional Navier-Stokes Equations.....	303
Hemker, P.W., Koren, B. and Spekrijse, S.P.: A Nonlinear Multigrid Method for the Efficient Solution of the Steady Euler Equations.....	308
Holt, M. and Pace, C.: Calculation of Flow in a Supersonic Compression Corner by the Dorodnitsyn Finite Element Method.....	314
Hou, T.X.: The Solution of System of Nonlinear Algebraic Equations Generated in Boundary Points Calculation.....	320
Huang, D.: A Test Problem for Unsteady Shock Wave Calculation.....	324
Huang, M.K.: Applications of Numerical Conformal Mapping Technique.....	329
Jameson, A. and Baker, T.J.: Euler Calculations for a Complete Aircraft.....	334
Jami, A. and Kermarec, M.: On the Convergence of Particle Methods Applied to the Euler and Free Surface Equations.....	345
Johnson, G.M., Swisshelm, J.M., Pryor, D.V. and Ziebarth, J.P.: Multitasked Embedded Multigrid for Three-Dimensional Flow Simulation.....	350
Kamenetsky, V.F. and Turchak, L.I.: Numerical Simulation of Some Separated Flows.....	357
Kanda, H. and Oshima, K.: Numerical Study of the Entrance Flow of a Circular Pipe.....	363
Kaul, U.K.: A Numerical Method to Assess the Feedback in a Free Shear Layer.....	369
Khosla, P.K. and Rubin, S.G.: Consistent Strongly Implicit Iterative Procedures.....	375
Korczak, K.Z.: An Isoparametric Spectral Element Method in Simulation of Incompressible Complex Flows.....	381
Krause, E., Menne, S. and Liu, C.H.: Initiation of Breakdown in Slender Compressible Vortices	386

Ku, H.C., Hirsh, R.S. and Taylor, T.D.: A Pseudospectral Method for Solution of the Three-Dimensional Incompressible Navier-Stokes Equations.....	391
Kwak, D., Rogers, S.E., Kaul, U.K. and Chang, J.L.C.: A Numerical Study of Incompressible Junction Flows.....	398
Lee, W.H. and Kwak, D.: On the PIC Method for Elastic-Plastic Flow.....	403
Li, C.P.: Implicit Methods for Computing Chemically Reacting Flow.....	409
Li, Y.F. and Qian, E.P.: A "Large-Particle" Difference Method with Second Order Accuracy for Computation of Two-Dimensional Unsteady Flows.....	416
Ling, B.Y. and Cole, J.D.: Airfoil Design at Sonic Velocity.....	422
Löhner, R., Patnaik, G., Boris, J.P., Oran, E.S. and Book, D.L.: Applications of the Method of Flux-Corrected Transport to Generalized Meshes.....	428
Lombard, C.K., Bardina, J., Venkatapathy, E., Yang, J.Y., Luh, R.C.C., Nagaraj, N. and Raiszadeh, F.: Accurate, Efficient and Productive Methodology for Solving Turbulent Viscous Flows in Complex Geometry.....	435
Ma, Y.W. and Fu, D.X.: A Simple and Efficient Implicit Scheme for the Compressible Navier-Stokes Equations.....	442
Madhavan, N.S. and Swaminathan, V.: On an Implicit Numerical Scheme for Two-Dimensional Steady Navier-Stokes Equations.....	448
Malik, M.R.: Numerical Simulation of Transition in a Three-Dimensional Boundary Layer.....	455
Mansutti, D., Bulgarelli, U., Piva, R. and Graziani, G.: A Discrete Vector Potential Method for Unsteady 3-D Navier-Stokes Equations.....	462
Mathieu, J., Ravier, P., Boujot, J., Gendre, P. and Hittinger, M.: Interaction Between Structure and Free Surface Fluid with Large Displacements by Finite Elements.....	467
Melnik, R.E., Brook, J.W. and DelGuidice, P.: Computation of Turbulent Separated Flow with an Integral Boundary Layer Method.....	473
Mitra, N.K., Kiehm, P. and Fiebig, M.: Numerical Investigations of the Structure of Three-Dimensional Confined Wakes Behind a Circular Cylinder.....	481
Morton, K.W. and Paisley, M.F.: On the Cell-Centre and Cell-Vertex Approaches to the Steady Euler Equations and the Use of Shock Fitting.....	488
Nakahashi, K.: FDM-FEM Zonal Approach for Computations of Compressible Viscous Flows.....	494
Nishikawa, N., Suzuki, T. and Suzuki, A.: Numerical Simulation of Splash of Droplet.....	499
Nordström, J.: Energy Absorbing Boundary Conditions for the Navier-Stokes Equation.....	505

Oshima, K., Oshima, Y., Izutsu, N., Ishii, Y. and Noguchi, T.: Interaction of Vortical Flow Regions.....	511
Osswald, G.A., Ghia, K.N. and Ghia, U.: Simulation of Buffetting Stall for a Cambered Joukowski Airfoil Using a Fully Implicit Method.....	516
Perez, E., Periaux, J., Rosenblum, J.P., Stoufflet, B., Dervieux, A. and Lallemand, M.H.: Adaptive Full-Multigrid Finite Element Methods for Solving the Two-Dimensional Euler Equations.....	523
Qin, N. and Richards, B.E.: Simulation of Hypersonic Viscous Flows Around a Cone-Delta-Wing Combination by an Implicit Method with Multigrid Acceleration.....	528
Reister, H., and Schwamborn, D.: Viscous Pressure Wave Boundary Layer Interaction.....	533
Ruas, V.: Some Nonstandard Finite Element Methods for the Numerical Solution of Viscous Flow Problems.....	538
Rusanov, V.V.: Exact Solution of Nonlinear Difference Equations for Discrete Shock Waves.....	545
Salmond, D.J.: A Cell-Vertex Multigrid Scheme for Solution of the Euler Equations for Transonic Flow past a Wing.....	549
Savu, G. and Trifu, O.: Numerical Prediction of the Aerodynamic Behaviour of Porous Airfoils.....	554
Selmin, V. and Quartapelle, L.: Finite Element Solution to the Euler Equations.....	559
Shaw, G. and Wesseling, P.: Multigrid Solution of the Compressible Navier-Stokes Equations on a Vector Computer.....	566
Shevéley, Yu.D.: Using of an Arbitrary Coordinate for Three- Dimensional Fluid Dynamic Problems.....	572
Shokin, Yu. I.: On Conservatism of Difference Schemes of Gas Dynamics.....	578
Strani, M. and Sabetta, F.: A Numerical Analysis of a Nonlinear Eigenvalue Problem Occurring in Viscous Oscillations of a Supported Drop.....	584
Su, M.D.: Algebraic Model of Large Eddy Simulation.....	589
Takemoto, Y. and Nakamura, Y.: A Three-Dimensional Incompressible Flow Solver.....	594
Teng, Z.-H.: Variable-Elliptic-Vortex Method for Incompressible Flow Simulation.....	600
Thomas, J.W., Schweitzer, R., Heroux, M., McCormick, S. and Thomas, A.M.: Application of the Fast Adaptive Composite Grid Method to Computational Fluid Dynamics	606
Ting, L. and Liu, G.C.: Merging of Vortices with Decaying Cores and Numerical Solutions of the Navier-Stokes Equations.....	612

XII

Tokunaga, H., Satofuka, N. and Miyagawa, H.: Direct Simulation of Shear Flow Turbulence in a Plane Channel by Sixth Order Accurate Method of Lines with New Sixth Order Accurate Multi-Grid Poisson Solver.....	617
Verstappen, R., ten Thijsse, J., de Vries, R.W. and Zandbergen, P.J.: Solutions of the Navier-Stokes Equations Using an Efficient Spectral Method.....	622
Walters, R.W., Thomas, J.L. and Van Leer, B.: An Implicit Flux-Split Algorithm for the Compressible Euler and Navier-Stokes Equations.....	628
Wang, L.X. and Luo, S.J.: Numerical Solution of Transonic Small Disturbance Pressure Equation and Its Applications.....	636
Wang, R.Q., Han, Y.G., Zhou, B.M. and Sun, J.A.: A New Switch-Scheme for Convection-Diffusion Equations.....	642
Warming, R.F. and Beam, R.M.: Stability of Semidiscrete Approximations for Hyperbolic Initial-Boundary-Value Problems: An Eigenvalue Analysis.....	647
Weiland, C. and Pfitzner, M.: 3-D and 2-D Solutions of the Quasi-Conservative Euler Equations.....	654
Wu, J.H.: An Unconditionally L_∞ - Stable Method of Fractional Steps for Numerical Solution of Convective Diffusion Problems.....	660
Yang, J.Y.: A Hybrid Upwind Scheme for the Computation of Shock-on-Shock Interaction Around Blunt Bodies.....	666
Yang, Z.H. and Keller, H.B.: Multiple Laminar Flows Through Curved Pipes.....	672
Yee, H.C.: Numerical Experiments With a Symmetric High-Resolution Shock-Capturing Scheme.....	677
Zeng, Q.C., Zhang, X.H., Yuan, C.G. and Liang, X.Z.: A Design and Test of a Numerical Coupled Land-Atmosphere-Ocean Model.....	684
Zhang, H.X. and Zheng, M.: A Mixed Antidissipative Method Solving Three-Dimensional Separated Flow.....	689
Zhang, J.: Pointwise Finite Element Method and Its Applications to Compressible Flows.....	694
Zhang, J.B.: Unsteady Transonic Flows Around Oscillating Wings.....	700
Zhou, L.X. and Zhang J.: A Lagrangian-Eulerian Particle Model for Turbulent Two-Phase Flows with Reacting Particles.....	705
Zhu, Z.Q. and Sobieczky, H.: Analysis of Transonic Wings Including Viscous Interaction.....	710
List of Participants.....	715