

Contents

Invited Lectures

ROESNER, K. G.: Numerical Calculation of Hydrodynamic Stability Problems with Time-Dependent Boundary Conditions	1
SAMARSKII, A. A.: On Numerical Simulation in Fluid Dynamics	26
TEMAM, R.: Some Finite Element Methods in Fluid Flow	34

Communications

ASTAF'EVA, N. M., VVEDENSKAYA, N. D., and YAVORSKAYA, I. M.: Numerical Study of Nonlinear Axisymmetric Flow of Fluid Between Two Concentric Rotating Spheres	56
BABENKO, K. I.: Investigation of Hydrodynamic Stability by Means of Computers	64
BALLHAUS, W. F., HOLST, T. L., and STEGER, J. L.: Implicit Finite- Difference Simulations of Steady and Unsteady Transonic Flows	73
BELOTSERKOVSKII, O. M., and KHOLODOV, A. S.: Numerical Investigation of Some Gas Dynamics Problems by Net-Characteristic Method	79
BELOTSERKOVSKII, S. M., LIFANOV, I. K., and NISHT, M. I.: The Method of Discrete Vortices in Aerohydrodynamic Problems and the Theory of Multidimensional Singular Integral Equations	89
BONTOUX, P., FORESTIER, B., and ROUX, B.: Analysis of Higher Order Methods for the Numerical Simulation of Confined Flows	94
BRUSHLINSKY, K. V., and SAVEL'EV, V. V.: Numerical Simulations of Two-Dimensional Plasma Flows	103
BUNEMAN, O., COUËT, B., and LEONARD, A.: Numerical Simulation of Turbulent Flows with a Three-Dimensional Vortex-in-Cell Method	108
CABANNES, H., GATIGNOL, R., and LEGUILLON, D.: Mathematical and Numerical Aspects of Discrete Kinetic Theory	115
CHATOT, J. J., GUIU-ROUX, J., and LAMINIE, J.: Resolution Numerique d'une Equation de Conservation par une Approche Variationnelle	121
CHENG, S.-I.: Errors in Finite Difference Solutions of Navier- Stokes Equations	130
CUVELIER, C.: A Free Boundary Problem in Hydrodynamic Lubrication Including Surface Tension	143
DAVYDOV, Yu. M.: Approximation Viscosity and Stability of Difference Schemes	149
DICARLO, A., PIVA, R., and GUJ, G.: A Study on Curvilinear Coordinates and Macro-Elements for Multiply Connected Flow Fields	161

DIJKSTRA, D.: Separating, Incompressible, Laminar Boundary-Layer Flow Over a Smooth Step of Small Height	169
DIJKSTRA, D., SCHIPPERS, H., and ZANDBERGEN, P. J.: On Certain Solutions of the Non-Stationary Equations for Rotating Flow	177
EISEMAN, P. R.: A Unification of Unidirectional Flow Approximations	185
FLETCHER, C. A. J.: A Finite Element Formulation Suitable for Subsonic and Transonic Flow	193
FÖRSTER, K.: Tests of Computational Algorithms for Inviscid Hyperbolic Flows	202
GAL-CHEN, T.: Initialization of the Navier-Stokes Equations for Use in Numerical Simulations and Predictions of Severe (Convective) Weather Events.....	211
GEGELIA, T. G., and ZVIADADZE, T. Ya.: The Algorithm of Approximate Calculation of Potential-Type Singular Integrals and Their Applications	217
GERSHBEIN, E. A., GOL'DIN, V. D., SUKHODOL'SKY, S. L., and TIRSKY, G. A.: Aerodynamics and Dynamics of Bodies With Mass Loss and Shape Change Under the Influence of Radiative Heating	223
GLAZ, H. M.: Ergodic Behavior of Two-Dimensional Inviscid Turbulence	232
GOLOVACHOV, Yu. P., KARYAKIN, V. E., LUNKIN, Yu. P., and POPOV, F. D.: Calculation of the Three-Dimensional Supersonic Blunt Body Flow of Viscous Perfect Gas and Nonequilibrium Gas Mixtures	242
GOLOVIZNIN, V. M., SAMARSKII, A. A., FAVORSKII, A. P., and KOZSHIA, T. K.: Numerical Simulation of MHD-Problems on the Basis of Variational Approach	248
GOLOVKIN, V. A., and GOLOVKIN, M. A.: Numerical Solution for Unsteady Separated Inviscid Incompressible Flow Past an Arbitrary Body	253
GOSPODINOV, P., PENCHEV, I., and RADEV, S.: Direct Numerical Method for the Velocity Profile and the Form of a Laminar Jet in a Liquid-Liquid System	260
GRABITZ, G.: Model Calculations of Self-Excited Oscillations in Transonic Flow in a Duct With an Abrupt Enlargement	268
HIRSCH, Ch., and WARZEE, G.: An Orthogonal Finite Element Method for Transonic Flow Calculations	274
HIRSH, R. S., FRIEDMAN, D. M., and CEBECI, T.: Solution of Turbulent Transport Equations by an Accurate Numerical Method	282
JAMI, A., and LENOIR, M.: A New Numerical Method for Solving Exterior Linear Elliptic Problems	292
KACHANOV, Yu. S., KOZLOV, V. V., LEVCHENKO, V. Ya., and MAKSIMOV, V. P.: The Transformation of External Disturbances into the Boundary Layer Waves	299
KALIS, H. E., KLYUKIN, A. A., and KOLESNIKOV, Yu. B.: The Effect of Strong Magnetic Field on the Shift Flow of Viscous Incompressible Electroconducting Fluid	303

VII

KLOPPER, G. H.: A Lagrangian Method for the Numerical Solution of the Euler Equations for Transonic Flows318

KOROBELNIKOV, V. P., PUTJATIN, B. V., CHUSHKIN, P. I., and SHURSHALOV, L. V.: On Computational Modelling of the Tunguska Catastrophe325

KOZEL, K., POLASEK, J., and VAVRINCOVA, M.: Numerical Solution of Transonic Flow Through a Cascade with Slender Profiles333

LANGLOIS, W. E.: Czochralski Bulk Flow in the Growth of Garnet Crystals339

LERAT, A.: Numerical Shock Structure and Nonlinear Corrections for Difference Schemes in Conservation Form345

LEVIN, V. A., MARKOV, V. V., OSINKIN, S. F., and TUNIK, J. V.: Numerical Simulation of Explosion Phenomena Taking Into Account Non-Equilibrium Physical-Chemical Processes352

LEVY, R., McDONALD, H., AND BRILEY, W. R.: Calculation of Three-Dimensional Turbulent Subsonic Flows in Transition Ducts361

MACCARIO, J., and COLLINS, R.: Pulmonary Haemodynamics370

MCCRACKEN, M. F., and PESKIN, C. S.: A Vortex-Grid Method for Blood Flow Through Heart Valves377

McRAE, D. S., and HUSSAINI, M. Y.: Supersonic Viscous Flow Over Cones at Incidence385

MINAYLOS, A. N.: Calculation of Supersonic Gas Flows About Wings393

MOIN, P., MANSOUR, N. N., REYNOLDS, W. C., and FERZIGER, J. H.: Large Eddy Simulation of Turbulent Shear Flow400

NIELSEN, H. B., and TRUE, H.: Numerical Solution of the Nonlinear Stability of an Incompressible Ekman Boundary Layer410

NISHIKAWA, N.: Non-Forward-Marching Method for Three Dimensional Flow Around Spinning Bodies416

OLEINIK, O. A.: Applications of the Energy Estimates Analogous to Saint-Venant's Principle to Problems of Elasticity and Hydrodynamics422

OSHIMA, K., OSHIMA, Y., and KURIYAMA, Y.: Finite Element Analysis of Viscous Incompressible Flow Around an Oscillating Airfoil433

PANDOLFI, M., and ZANNETTI, L.: Some Permeable Boundaries in Multidimensional Unsteady Flows439

PASKONOV, V. M.: Supersonic Flow of Viscous Gas Around Bodies and the Flow in the Wake (Methods of a Numerical Solution and Computing Results)447

POLEZHAYEV, V. I., GRYAZNOV, V. L., DAIKOVSKY, A. G., and FEDOSEYEV, A. I.: Numerical Models of Turbulent Convection Based on the Unsteady Navier-Stokes Equations454

VIII

RIZZI, A.: Solution by Newton's Method to the Steady Transonic Euler Equations 460

RUBIN, S. G., and KHOSIA, P. K.: A Simplified Spline Solution Procedure 468

RUSANOV, V. V.: A Test Case for Checking Computational Methods for Gas Flows With Discontinuities 477

SHOKIN, Yu. I., MARCHUK, An. G., and CHUBAROV, L. B.: To the Numerical Simulation and Propagation of Tsunami According to the Shallow Water Equations 487

SOD, G. A.: A Hybrid Random Choice Method With Application to Internal Combustion Engines 492

STYCZEK, A.: The Solution of the Navier-Stokes Equation, Via Successive Approximations 502

TOLSTYKH, A. I.: On the Condensing of Grid Points in the Process of Solving and High Order Schemes in Viscous Gas Flow Computations..... 507

TURCHAK, L. I.: Investigation of Unsteady Supersonic Flows About Blunt Bodies..... 514

VADYAK, J., and HOFFMAN, J. D.: Calculation of the Flow Field in Supersonic Inlets Using a Bicharacteristics Method With Shock Wave Fitting 523

VAN ATTA, C. W.: Bispectral Measurements in Turbulence Computations..... 530

VASHAKMAZDE, T. S.: On the Application of Orthogonal Polynomials in the Theory of Elasticity..... 537

WIDHOFF, G. F., and GLATT, L.: Numerical Modeling of Atmospheric Pollution..... 542

WU, J. C., and RIZK, Y. M.: Integral-Representation Approach for Time-Dependent Viscous Flows..... 558

YANENKO, N. N., KOVENYA, V. M., and LISEJKIN, V. D.: On Some Methods for the Numerical Simulation of Flows With Complex Structure..... 565

YEN, S. M., and LEE, K. D.: Design Criteria and Generation of Optimum Finite Element Meshes 579

ZABRODIN, A. V., PROKOPOV, G. P., and CHERKASHIN, V. A.: Self-Adapted Algorithms in Problems of Gas Dynamics..... 587

ZEYTOUNIAN, R. Kh.: Application of Lagrangian Invariants to the Calculation of Three-Dimensional Rotational Flows of a Perfect Fluid..... 594

LIST OF THE PARTICIPANTS 600