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Nota di contenuto	Invited Papers -- Eigenvalue Estimates for Preconditioned Saddle Point Matrices -- A 3D Projection Scheme for Incompressible Multiphase Flows Using Dynamic Front Refinement and Reconnection -- Schwarz-Like Methods for Approximate Solving Cooperative Systems -- Computational Infrastructure for Parallel, Distributed, and Grid-Based Monte Carlo Computations -- Parallel Solution of Very Large Sparse

Systems of Linear Algebraic Equations -- Recent Achievements in Preconditioning -- Solution of Robust Linear Regression Problems by Krylov Subspace Methods -- Two-Level Preconditioning of Crouzeix-Raviart Anisotropic FEM Systems -- Parallel High Performance Computing on Composite Grids -- Parallel Preconditioning for Sedimentary Basin Simulations -- Monte Carlo and Quasi-Monte Carlo Methods -- Modeling of Narrow-Width SOI Devices: The Role of Quantum Mechanical Narrow Channel Effects on Device Performance -- Monte Carlo Algorithm for Ballistic Object Tracking with Uncertain Drag Parameter -- Efficient CPU-Specific Algorithm for Generating the Generalized Faure Sequences -- A New Quasi-Monte Carlo Algorithm for Numerical Integration of Smooth Functions -- Monte Carlo Method for Multiple Knapsack Problem -- Importance Separation for Solving Integral Equations -- A Parallel Monte Carlo Method for Electron Quantum Kinetic Equation -- Solving BVPs Using Quasirandom Walks on the Boundary -- A Stable Backward Monte Carlo Method for the Solution of the Boltzmann Equation -- A Weight Decomposition Approach to the Sign Problem in Wigner Transport Simulations -- A Zero Field Monte Carlo Algorithm Accounting for the Pauli Exclusion Principle -- Set-Valued Numerics and Reliable Computing -- Solution Methods for Age-Structured Optimal Control Models with Feedback -- Multivariate Rational Interpolation of Scattered Data -- Approximation Methods for Nonconvex Parabolic Optimal Control Problems Using Relaxed Controls -- Stabilizing Feedback of a Nonlinear Biological Wastewater Treatment Plants Model -- Higher Order Approximations of Affinely Controlled Nonlinear Systems -- Outlier Detection under Interval Uncertainty: Algorithmic Solvability and Computational Complexity -- On the Approximation of Centered Zonotopes in the Plane -- On Range Evaluation of Polynomials by Applying Interval Arithmetic -- Sharp Bounds for Strains and Stresses in Uncertain Mechanical Models -- One Approximation to the Reachable Sets of Strongly Convex Differential Inclusions -- Robust Methodology for Characterizing System Response to Damage: Approach Based on Partial Order -- Environmental Modelling -- Comparison of Two Local Refinement Methods for Large Scale Air Pollution Simulations -- Testing Weighted Splitting Schemes on a One-Column Transport-Chemistry Model -- Long-Range Transport of Dust to the Baltic Sea Region -- Atmospheric Dispersion and Pollutant Chemical Transformation Simulated with Parallel Calculation Using a PC Cluster -- A Mesoscale Study of Large Industrial Emission Impact over Madrid Mesoscale Domain by Using MM5-CMAQ Modelling System -- Study of the Pollution Exchange between Bulgaria and Northern Greece -- Studying High Ozine Levels in Bulgaria and Europe -- Large Scale Computation for Engineering Problems -- Collocation Methods for Boundary Value Problems with an Essential Singularity -- Boundary Integral Method for Deformable Interfaces in the Presence of Insoluble Surfactants -- Large Eddy Simulation of Turbulent Square Channel Flow Using a PC-Cluster Architecture -- Adaptive Grid Refinement for Computation of the Homogenized Elasticity Tensor -- Multigrid Preconditioned Solvers for Some Elastoplastic Problems -- The Free Transmission Problem for a Water Droplet -- Numerical Simulation of the Flow in Magnetic Fluid Rotary Shaft Seals -- Phase-Field Method for 2D Dendritic Growth -- Design of 2-D FIR Digital Filters Using a Parallel Machine -- Contributed Talks -- Parallel Performance Comparison of Three Direct Separable Elliptic Solvers -- Finite Volume Difference Methods for Convection-Dominated Problems with Interface -- Parameter Estimations in Nonlinear Parabolic Systems with Time Delay -- Systolic Architecture of Adaptive Post Detection Integration CFAR

Processor in Binomial Distribution Pulse Jamming -- Immersed-Boundary Level Set Approach for Numerical Solution of Elliptic Interface Problems -- Generalized Nonstandard Numerical Methods for Nonlinear Advection-Diffusion-Reaction Equations -- On the Computation of Blow-Up Solutions of Elliptic Equations with Semilinear Dynamical Boundary Conditions -- A Method for Solving Hermitian Pentadiagonal Block Circulant Systems of Linear Equations.

Sommario/riassunto

The papers in this volume were presented at the 4th International Conference on Large-Scale Scientific Computations ICLSSC 2003. It was held in Sozopol, Bulgaria, June 4–8, 2003. The conference was organized and sponsored by the Central Laboratory for Parallel Processing at the Bulgarian Academy of Sciences. Support was also provided from the Center of Excellence “BIS 21” (funded by the European Commission), SIAM and GAMM. A co-organizer of this traditional scientific meeting was the Division of Numerical Analysis and Statistics of the University of Rousse. The success of the conference and the present volume in particular are the outcome of the joint efforts of many colleagues from various institutions and organizations. First thanks to all the members of the Scientific Committee for their valuable contribution to forming the scientific face of the conference, as well as for their help in reviewing contributed papers. We would like to specially thank the organizers of the special sessions: R. Blaheta, N. Dimitrova, A. Ebel, K. Georgiev, O. Iliev, A. Karaivanova, H. Kosina, M. Krastanov, U. Langer, P. Minev, M. Neytcheva, M. Sch¨ afer, V. Veliov, and Z. Zlatev. We are also grateful to the staff involved in the local organization. Special Events: – The conference was devoted to the 60th anniversary of Raytcho Lazarov. – During the conference, the nomination for the World Level of the Hall of Fame for Engineering, Science and Technology, HOFEST, was officially awarded to Owe Axelsson.