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Large-Scale Scientific Computing

7th International Conference, LSSC 2009
Sozopol, Bulgaria, June 4-8, 2009
Revised Papers

Springer

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Preface

The 7th International Conference on Large-Scale Scientific Computations (LSSC 2009) was held in Sozopol, Bulgaria, June 4–8, 2009. The conference was organized and sponsored by the Institute for Parallel Processing at the Bulgarian Academy of Sciences.

The conference was devoted to the 70th birthday anniversary of Professor Zahari Zlatev. The Bulgarian Academy of Sciences awarded him the Marin Drinov medal on ribbon for his outstanding results in environmental mathematics and for his contributions to the Bulgarian mathematical society and the Academy of Sciences.

The plenary invited speakers and lectures were:

- P. Arbenz, "μFinite Element Analysis of Human Bone Structures"
- Y. Efendiev, "Mixed Multiscale Finite Element Methods Using Limited Global Information"
- U. Langer, "Fast Solvers for Non-Linear Time-Harmonic Problems"
- T. Manteuffel, "First-Order System Least-Squares Approach to Resistive Magnetohydrodynamic Equations"
- K. Sabelfeld, "Stochastic Simulation for Solving Random Boundary Value Problems and Some Applications"
- F. Tröltzsch, "On Finite Element Error Estimates for Optimal Control Problems with Elliptic PDEs"
- Z. Zlatev, "On Some Stability Properties of the Richardson Extrapolation Applied Together with the θ-method"

The success of the conference and the present volume in particular are an outcome of the joint efforts of many partners from various institutions and organizations. First we would like to thank all the members of the Scientific Committee for their valuable contribution forming the scientific face of the conference, as well as for their help in reviewing contributed papers. We especially thank the organizers of the special sessions. We are also grateful to the staff involved in the local organization.

Traditionally, the purpose of the conference is to bring together scientists working with large-scale computational models of environmental and industrial problems, and specialists in the field of numerical methods and algorithms for modern high-performance computers. The invited lectures reviewed some of the advanced achievements in the field of numerical methods and their efficient applications. The conference talks were presented by university researchers and practical industry engineers including applied mathematicians, numerical analysts and computer experts. The general theme for LSSC 2009 was "Large-Scale Scientific Computing" with a particular focus on the organized special sessions.

The special session organizer were:

- Multilevel and Multiscale Preconditioning Methods — J. Kraus, S. Margenov, M. Neytcheva
- Upscaling and Multiscale Methods — M. Katsoulakis, R. Lazarov
- Industrial and Biomedical Multiscale Problems — Y. Efendiev, O. Iliev, P. Popov
- Environmental Modelling — A. Ebel, K. Georgiev, Z. Zlatev
- Control and Uncertain Systems — M. Krastanov, V. Veliov
  This session was dedicated to the 60th anniversary of Asen Donchev.
- Applications of Metaheuristics to Large-Scale Problems — F. Luna, S. Fidanova
- Monte Carlo: Methods, Applications, Distributed Computing — I. Dimov, V. Mitin, M. Nedjalkov
- Grid and Scientific and Engineering Applications — A. Karaivanova, E. Atanassov, T. Gurov
- Reliable Numerical Methods for Differential Equations — I. Faragó, J. Karátson, S. Korotov
- Discretization and Fast Solution Techniques for Large-Scale Physics Applications — P. Vassilevski, L. Zikatanov
- Least Squares Finite Element Methods — P. Bochev, T. Manteuffel
- Unconventional Uses of Optimization in Scientific Computing — P. Bochev, D. Ridzal

More than 140 participants from all over the world attended the conference representing some of the strongest research groups in the field of advanced large-scale scientific computing. This volume contains 99 papers submitted by authors from 24 countries.

The 8th International Conference on Large-Scale Scientific Computations (LSSC 2011) will be organized in June 2011.

January 2010

Ivan Lirkov
Svetozar Margenov
Jerzy Waśniewski

Table of Contents

I Plenary and Invited Papers

An Efficiency-Based Adaptive Refinement Scheme Applied to Incompressible, Resistive Magnetohydrodynamics 1
J. Adler, T. Manteuffel, S. McCormick, J. Nolting, J. Ruge, and L. Tang

Discontinuous Galerkin Subgrid Finite Element Method for Heterogeneous Brinkman's Equations 14
Oleg P. Iliev, Raytcho D. Lazarov, and Joerg Willems

Stochastic Simulation for Solving Random Boundary Value Problems and Some Applications 26
Karl Sabelfeld

On Finite Element Error Estimates for Optimal Control Problems with Elliptic PDEs 40
Fredi Tröltzsch

On Some Stability Properties of the Richardson Extrapolation Applied Together with the θ-Method 54
Zahari Zlatev, István Faragó, and Ágnes Havasi

II Multilevel and Multiscale Preconditioning Methods

On the Use of Aggregation-Based Parallel Multilevel Preconditioners in the LES of Wall-Bounded Turbulent Flows 67
Andrea Aprovitola, Pasqua D'Ambra, Daniela di Serafino, and Salvatore Filippone

An Additive Matrix Preconditioning Method with Application for Domain Decomposition and Two-Level Matrix Partitionings 76
Owe Axelsson

Numerical Study of AMLI Methods for Weighted Graph-Laplacians 84
Petia Boyanova and Svetozar Margenov

A Scalable TFETI Based Algorithm for 2D and 3D Frictionless Contact Problems 92
Zdeněk Dostál, Tomáš Brzobohatý, Tomáš Kozubek, Alex Markopoulos, and Vít Vondrák

Multilevel Preconditioning of Crouzeix-Raviart 3D Pure Displacement Elasticity Problems 100
Ivan Georgiev, Johannes Kraus, and Svetozar Margenov

Element-by-Element Schur Complement Approximations for General Nonsymmetric Matrices of Two-by-Two Block Form 108
Maya Neytcheva, Minh Do-Quang, and He Xin

Numerical Simulation of Fluid-Structure Interaction Problems on Hybrid Meshes with Algebraic Multigrid Methods 116
Huidong Yang and Walter Zulehner

III Multilevel and Multiscale Methods for Industrial Applications

Recent Developments in the Multi-Scale-Finite-Volume Procedure 124
Giuseppe Bonfigli and Patrick Jenny

Boundary Element Simulation of Linear Water Waves in a Model Basin 132
Clemens Hofreither, Ulrich Langer, and Satyendra Tomar

Numerical Homogenization of Bone Microstructure 140
Nikola Kosturski and Svetozar Margenov

Multiscale Modeling and Simulation of Fluid Flows in Highly Deformable Porous Media 148
P. Popov, Y. Efendiev, and Y. Gorb

IV Environmental Modelling

Assimilation of Chemical Ground Measurements in Air Quality Modeling 157
Gabriele Candiani, Claudio Carnevale, Enrico Pisoni, and Marialuisa Volta

Numerical Simulations with Data Assimilation Using an Adaptive POD Procedure 165
Gabriel Dimitriu, Narcisa Apreutesei, and Răzvan Ştefănescu

Game-Method Model for Field Fires 173
Nina Dobrinkova, Stefka Fidanova, and Krassimir Atanassov

Joint Analysis of Regional Scale Transport and Transformation of Air Pollution from Road and Ship Transport 180
K. Ganev, D. Syrakov, G. Gadzhev, M. Prodanova, G. Jordanov, N. Miloshev, and A. Todorova

Runs of UNI-DEM Model on IBM Blue Gene/P Computer and Analysis of the Model Performance 188
Krassimir Georgiev and Zahari Zlatev

Sensitivity Analysis of a Large-Scale Air Pollution Model: Numerical Aspects and a Highly Parallel Implementation 197
Tzvetan Ostromsky, Ivan T. Dimov, Rayna Georgieva, and Zahari Zlatev

Advanced Results of the PM10 and PM2.5 Winter 2003 Episode by Using MM5-CMAQ and WRF/CHEM Models 206
Roberto San José, Juan L. Pérez, José L. Morant, F. Prieto, and Rosa M. González

Four-Dimensional Variational Assimilation of Atmospheric Chemical Data – Application to Regional Modelling of Air Quality 214
Achim Strunk, Adolf Ebel, Hendrik Elbern, Elmar Friese, Nadine Goris, and Lars Peter Nieradzik

Numerical Study of Some High PM10 Levels Episodes 223
A. Todorova, G. Gadzhev, G. Jordanov, D. Syrakov, K. Ganev, N. Miloshev, and M. Prodanova

V Control and Uncertain Systems

Hausdorff Continuous Viscosity Solutions of Hamilton-Jacobi Equations 231
Roumen Anguelov, S. Markov, and F. Minani

Stochastic Skiba Sets: An Example from Models of Illicit Drug Consumption 239
Roswitha Bultmann, Gustav Feichtinger, and Gernot Tragler

Classical and Relaxed Optimization Methods for Nonlinear Parabolic Optimal Control Problems 247
I. Chryssoverghi, J. Coletsos, and B. Kokkinis

Exponential Formula for Impulsive Differential Inclusions 256
Tzanko Donchev

Directional Sensitivity Differentials for Parametric Bang-Bang Control Problems 264
Ursula Felgenhauer

Estimates of Trajectory Tubes of Uncertain Nonlinear Control Systems 272
Tatiana F. Filippova

Asymptotics for Singularly Perturbed Reachable Sets 280
Elena Goncharova and Alexander Ovseevich

On Optimal Control Problem for the Bundle of Trajectories of Uncertain System 286
Mikhail I. Gusev

High-Order Approximations to Nonholonomic Affine Control Systems 294
Mikhail I. Krastanov and Vladimir M. Veliov

VI Application of Metaheuristics to Large Scale Problems

A Parametric Multi-start Algorithm for Solving the Response Time Variability Problem 302
Albert Corominas, Alberto García-Villoria, and Rafael Pastor

Enhancing the Scalability of Metaheuristics by Cooperative Coevolution 310
Ciprian Crăciun, Monica Nicoară, and Daniela Zaharie

Hybrid ACO Algorithm for the GPS Surveying Problem 318
Stefka Fidanova, Enrique Alba, and Guillermo Molina

Generalized Nets as Tools for Modeling of the Ant Colony Optimization Algorithms 326
Stefka Fidanova and Krassimir Atanassov

A Scatter Search Approach for Solving the Automatic Cell Planning Problem 334
Francisco Luna, Juan J. Durillo, Antonio J. Nebro, and Enrique Alba

Some Aspects Regarding the Application of the Ant Colony Meta-heuristic to Scheduling Problems 343
Ioana Moisil and Alexandru-Liviu Olteanu

High-Performance Heuristics for Optimization in Stochastic Traffic Engineering Problems 352
Evdokia Nikolova

Optimization of Complex SVM Kernels Using a Hybrid Algorithm Based on Wasp Behaviour 361
Dana Simian, Florin Stoica, and Corina Simian

VII Monte Carlo: Methods, Applications, Distributed Computing

Enabling Cutting-Edge Semiconductor Simulation through Grid Technology 369
Asen Asenov, Dave Reid, Campbell Millar, Scott Roy, Gareth Roy, Richard Sinnott, Gordon Stewart, and Graeme Stewart

Incremental Reuse of Paths in Random Walk Radiosity 379
Francesc Castro and Mateu Sbert

Monte Carlo Adaptive Technique for Sensitivity Analysis of a Large-Scale Air Pollution Model 387
Ivan T. Dimov and Rayna Georgieva

Parallel Implementation of the Stochastic Radiosity Method 395
Roel Martínez and Jordi Coma

Monte-Carlo Modeling of Electron Kinetics in Room Temperature Quantum-Dot Photodetectors 403
Vladimir Mitin, Andrei Sergeev, Li-Hsin Chien, and Nizami Vagidov

Particle Model of the Scattering-Induced Wigner Function Correction 411
M. Nedjalkov, P. Schwaha, O. Baumgartner, and S. Selberherr

Analysis of the Monte Carlo Image Creation by Uniform Separation 419
A.A. Penzov, Ivan T. Dimov, L. Szirmay-Kalos, and V.N. Koylazov

The Role of the Boundary Conditions on the Current Degradation in FD-SOI Devices 427
K. Raleva, D. Vasileska, and S.M. Goodnick

Gamma Photon Transport on the GPU for PET 435
L. Szirmay-Kalos, B. Tóth, M. Magdics, D. Légrády, and A.A. Penzov

Transport in Nanostructures: A Comparative Analysis Using Monte Carlo Simulation, the Spherical Harmonic Method, and Higher Moments Models 443
M. Vasicek, V. Sverdlov, J. Cervenka, T. Grasser, H. Kosina, and S. Selberherr

Thermal Modeling of GaN HEMTs 451
D. Vasileska, A. Ashok, O. Hartin, and S.M. Goodnick

VIII Grid and Scientific and Engineering Applications

Tuning the Generation of Sobol Sequence with Owen Scrambling 459
Emanouil Atanassov, Aneta Karaivanova, and Sofiya Ivanovska

Applying the Improved Saleve Framework for Modeling Abrasion of Pebbles 467
Péter Dóbé, Richárd Kápolnai, András Sipos, and Imre Szeberényi

Information Flow and Mirroring in an Agent-Based Grid Resource Brokering System 475
Maria Ganzha, Marcin Paprzycki, Michal Drozdowicz, Mehrdad Senobari, Ivan Lirkov, Sofiya Ivanovska, Richard Olejnik, and Pavel Telegin

Scatter Search and Grid Computing to Improve Nuclear Fusion Devices 483
Antonio Gómez-Iglesias, Miguel A. Vega-Rodríguez, Francisco Castejón-Magaña, Miguel Cárdenas-Montes, and Enrique Morales-Ramos

Service-Oriented Integration of Grid Applications in Heterogeneous Grids 491
Radoslava D. Goranova

Grid Based Environment Application Development Methodology 499
Dorian Gorgan, Teodor Stefanut, Victor Bacu, Danut Mihon, and Denisa Rodila

User Level Grid Quality of Service 507
Anastas Misev and Emanouil Atanassov

Dictionary Compression and Information Source Correction 515
Dénes Németh, Máté Lakat, and Imre Szeberényi

A Parallelization of Finite Volume Method for Calculation of Gas Microflows by Domain Decomposition Methods 523
Kiril S. Shterev and Stefan K. Stefanov

Background Pollution Forecast over Bulgaria 531
D. Syrakov, K. Ganev, M. Prodanova, N. Miloshev, G. Jordanov, E. Katragkou, D. Melas, A. Poupkou, and K. Markakis

Climate Change Impact Assessment of Air Pollution Levels in Bulgaria 538
D. Syrakov, M. Prodanova, N. Miloshev, K. Ganev, G. Jordanov, V. Spiridonov, A. Bogatchev, E. Katragkou, D. Melas, A. Poupkou, and K. Markakis

Effective Algorithm for Calculating Spatial Deformations of Pre-stressed Concrete Beams 546
János Török, Dénes Németh, and Máté Lakat

IX Reliable Numerical Methods for Differential Equations

Structurally Stable Numerical Schemes for Applied Dynamical Models 554
Roumen Anguelov

Matrix and Discrete Maximum Principles 563
István Faragó

On a Bisection Algorithm That Produces Conforming Locally Refined Simplicial Meshes 571
Antti Hannukainen, Sergey Korotov, and Michal Křížek

A Discrete Maximum Principle for Nonlinear Elliptic Systems with Interface Conditions 580
János Karátson

Inverse Problem for Coefficient Identification in Euler-Bernoulli Equation by Linear Spline Approximation 588
Tchavdar T. Marinov and Rossitza S. Marinova

A Fully Implicit Method for Fluid Flow Based on Vectorial Operator Splitting 596
Rossitza S. Marinova, Raymond Spiteri, and Eddy Essien

Discrete Maximum Principle for Finite Element Parabolic Operators . . . 604
Miklos E. Mincsovics

Climate Change Scenarios for Hungary Based on Numerical Simulations with a Dynamical Climate Model 613
Ildikó Pieczka, Judit Bartholy, Rita Pongrácz, and Adrienn Hunyady

Numerical Simulations of Reaction-Diffusion Systems Arising in Chemistry Using Exponential Integrators 621
Răzvan Ştefănescu and Gabriel Dimitriu

On the Discretization Time-Step in the Finite Element Theta-Method of the Two-Dimensional Discrete Heat Equation 629
Tamás Szabó

X Novel Applications of Optimization Ideas to the Numerical Solution of PDEs

A Locally Conservative Mimetic Least-Squares Finite Element Method for the Stokes Equations 637
Pavel Bochev and Max Gunzburger

Additive Operator Decomposition and Optimization–Based Reconnection with Applications 645
Pavel Bochev and Denis Ridzal

Least-Squares Spectral Element Method on a Staggered Grid 653
Marc Gerritsma, Mick Bouman, and Artur Palha

Mimetic Least-Squares Spectral/*hp* Finite Element Method for the Poisson Equation 662
Artur Palha and Marc Gerritsma

Adaptive Least Squares Finite Element Methods in Elasto-Plasticity . . . 671
Gerhard Starke

The Automatic Construction and Solution of a Partial Differential Equation from the Strong Form 679
Joseph Young

XI Contributed Papers

Zienkiewicz-Type Finite Element Applied to Fourth-Order Problems . . . 687
Andrey B. Andreev and Milena R. Racheva

Acceleration of Convergence for Eigenpairs Approximated by Means of Non-conforming Finite Element Methods 695
Andrey B. Andreev and Milena R. Racheva

A Two-Grid Method on Layer-Adapted Meshes for a Semilinear 2D Reaction-Diffusion Problem 703
Ivanka T. Angelova and Lubin G. Vulkov

Comparative Analysis of Solution Methods for Delay Differential Equations in Hematology 711
Gergana Bencheva

Solving Non-linear Systems of Equations on Graphics Processing Units 719
Lubomir T. Dechevsky, Børre Bang, Joakim Gundersen, Arne Lakså, and Arnt R. Kristoffersen

Computing n-Variate Orthogonal Discrete Wavelet Transforms on Graphics Processing Units 730
Lubomir T. Dechevsky, Joakim Gundersen, and Børre Bang

Wavelet Compression, Data Fitting and Approximation Based on Adaptive Composition of Lorentz-Type Thresholding and Besov-Type Non-threshold Shrinkage 738
Lubomir T. Dechevsky, Joakim Gundersen, and Niklas Grip

On Interpolation in the Unit Disk Based on Both Radon Projections and Function Values 747
Irina Georgieva and Rumen Uluchev

Comparison between the Marching-Cube and the Marching-Simplex Methods 756
Joakim Gundersen, Arnt R. Kristoffersen, and Lubomir T. Dechevsky

Transitions from Static to Dynamic State in Three Stacked Josephson Junctions 765
Ivan Christov, Stefka Dimova, and Todor Boyadjiev

Factorization-Based Graph Repartitionings 771
Kateřina Jurková and Miroslav Tůma

An Efficient Algorithm for Bilinear Strict Equivalent (BSE)- Matrix Pencils 779
Grigoris I. Kalogeropoulos, Athanasios D. Karageorgos, and Athanasios A. Pantelous

Two-Grid Decoupling Method for Elliptic Problems on Disjoint Domains 787
Miglena N. Koleva and Lubin G. Vulkov

A Method for Sparse-Matrix Computation of B-Spline Curves and Surfaces 796
Arne Lakså

Parallel MIC(0) Preconditioning for Numerical Upscaling of Anisotropic Linear Elastic Materials 805
Svetozar Margenov and Yavor Vutov

The Bpmpd Interior Point Solver for Convex Quadratically Constrained Quadratic Programming Problems 813
Csaba Mészáros

On Shape Optimization of Acoustically Driven Microfluidic Biochips ... 821
Svetozara I. Petrova

Block Preconditioners for the Incompressible Stokes Problem 829
M. ur Rehman, C. Vuik, and G. Segal

Author Index 837