

Contents

Invited Papers

A Note on Local Refinement for Direction Splitting Methods.	3
<i>T. Gornak, O. Iliev, and P. Minev</i>	
On Positivity Preservation in Some Finite Element Methods for the Heat Equation	13
<i>V. Thomée</i>	

Monte Carlo and Quasi-Monte Carlo Methods

Optimized Particle Regeneration Scheme for the Wigner Monte Carlo Method	27
<i>Paul Ellinghaus, Mihail Nedjalkov, and Siegfried Selberherr</i>	
Sensitivity Analysis of Design Parameters for Silicon Diodes	34
<i>J.M. Sellier, Rayna Georgieva, and Ivan Dimov</i>	
Balancing of Systematic and Stochastic Errors in Monte Carlo Algorithms for Integral Equations	44
<i>Ivan Dimov, Rayna Georgieva, and Venelin Todorov</i>	

Metaheuristics for Optimization Problems

Slot Machines RTP Optimization with Genetic Algorithms.	55
<i>Todor Balabanov, Iliyan Zankinski, and Bozhidar Shumanov</i>	
Hierarchical Topology in Parallel Differential Evolution.	62
<i>Petr Bujok</i>	
On Meme Self-Adaptation in Spatially-Structured Multimemetic Algorithms. . .	70
<i>Rafael Nogueras and Carlos Cotta</i>	
An Ant Algorithm for the Partition Graph Coloring Problem	78
<i>Stefka Fidanova and Petrică C. Pop</i>	
Multi-exchange Neighborhoods for the Capacitated Ring Tree Problem	85
<i>Alessandro Hill</i>	
Hebbian Versus Gradient Training of ESN Actors in Closed-Loop ACD	95
<i>Petia Koprinkova-Hristova</i>	

Free Search in Multidimensional Space II 103
Kalin Penev

A Semi-numerical Approach to Radiation Boundary Conditions 112
Ivan A. Starkov and Alexander S. Starkov

Advanced Numerical Methods for Scientific Computing

Spectral Analysis of Geometric Multigrid Methods for Isogeometric Analysis . . . 123
Clemens Hofreither and Walter Zulehner

Numerical Homogenization of Epoxy-Clay Composite Materials 130
Ivan Georgiev, Evgeni Ivanov, Svetozar Margenov, and Y. Vutov

Isogeometric Analysis for Nonlinear Dynamics of Timoshenko Beams 138
Stanislav Stoykov, Clemens Hofreither, and Svetozar Margenov

Advanced Numerical Techniques for PDEs and Applications

Deterministic Solution of the Discrete Wigner Equation 149
Johann Cervenka, Paul Ellinghaus, and Mihail Nedjalkov

Explicit-Implicit Splitting Schemes for Parabolic Equations and Systems 157
Petr N. Vabishchevich and Petr E. Zakharov

Solving Large Engineering and Scientific Problems with Advanced Mathematical Models

Solving Two-Point Boundary Value Problems for Integro-Differential Equations Using the Simple Shooting-Projection Method 169
Stefan M. Filipov, Ivan D. Gospodinov, and Jordanka Angelova

HPC Simulations of the Fine Particulate Matter Climate of Bulgaria 178
Georgi Gadzhev, Kostadin Ganey, Nikolay Miloshev, Dimiter Syrakov, and Maria Prodanova

Tall RC Buildings Environmentally Degradated and Strengthened by Cables Under Multiple Earthquakes: A Numerical Approach. 187
Angelos Liolios, Anaxagoras Elenas, Asterios Liolios, Stefan Radev, Krassimir Georgiev, and Ivan Georgiev

Multi-scale Computational Framework for Evaluating of the Performance of Molecular Based Flash Cells 196
Vihar P. Georgiev and Asen Asenov

Numerical Simulations and Back Analysis in Civil and Mechanical Engineering

Parameter Identification of a Rate Dependent Constitutive Model for Rock Salt	207
<i>Kavan Khaledi, Elham Mahmoudi, Maria Datcheva, and Tom Schanz</i>	
Constitutive Parameter Adjustment for Mechanized Tunneling with Reference to Sub-system Effects	217
<i>Chenyang Zhao, Arash Alimardani Lavasan, Thomas Barciaga, Raoul Hölter, Maria Datcheva, and Tom Schanz</i>	
Modeling of Textiles as Nets of One-Dimensional Hyperelastic Strings with Friction Controlled by Capstan Equation.	226
<i>Vladimir Shiryayev and Julia Orlik</i>	

Contributed Papers

Numerical Simulation of Drop Coalescence in the Presence of Inter-Phase Mass Transfer.	237
<i>Ivan Bazhlekoy and Daniela Vasileva</i>	
Wavelet Compression of Spline Coefficients.	246
<i>Jostein Bratlie, Rune Dalmo, and Børre Bang</i>	
Target Localization by UWB Signals.	254
<i>Ján Buša</i>	
Performance of a Wavelet Shrinking Method	262
<i>Rune Dalmo, Jostein Bratlie, and Børre Bang</i>	
Two-Grid Decoupled Method for a Black-Scholes Increased Market Volatility Model	271
<i>Miglena N. Koleva and Lubin G. Vulkov</i>	
The Effect of a Postprocessing Procedure to Upper Bounds of the Eigenvalues.	279
<i>A.B. Andreev and M.R. Racheva</i>	
On a Type of Nonconforming Morley Rectangular Finite Element	287
<i>A.B. Andreev and M.R. Racheva</i>	
A Numerical Study of the Upper Bound of the Throughput of a Crossbar Switch Utilizing MiMa-Algorithm.	295
<i>Tasho Tashev and Vladimir Monov</i>	

Extremal Scattered Data Interpolation in \mathbb{R}^3 Using Triangular
Bézier Surfaces 304
 Krassimira Vlachkova

Author Index 313

Numerical Methods and Applications

8th International Conference, NMA 2014, Borovets,
Bulgaria, August 20-24, 2014, Revised Selected Papers

Dimov, I.; Fidanova, S.; Lirkov, I. (Eds.)

2015, XII, 313 p. 109 illus., Softcover

ISBN: 978-3-319-15584-5