

Contents

The Present of Supercomputing: Large Tasks Solving Experience

Accelerating Assembly Operation in Element-by-Element FEM on Multicore Platforms	3
<i>Sergey Kopysov, Alexander Novikov, Nikita Nedozhogin, and Vladimir Rychkov</i>	
Block Lanczos–Montgomery Method with Reduced Data Exchanges.	15
<i>Nikolai Zamarashkin and Dmitry Zheltkov</i>	
ChronosServer: Fast In Situ Processing of Large Multidimensional Arrays with Command Line Tools	27
<i>Ramon Antonio Rodrigues Zalipynis</i>	
Dynamics of Formation and Fine Structure of Flow Pattern Around Obstacles in Laboratory and Computational Experiment.	41
<i>Yu. D. Chashechkin, Ya. V. Zagumennyi, and N.F. Dimitrieva</i>	
EnOI-Based Data Assimilation Technology for Satellite Observations and ARGO Float Measurements in a High Resolution Global Ocean Model Using the CMF Platform	57
<i>Maxim Kaurkin, Rashit Ibrayev, and Alexandr Koromyslov</i>	
Experience of Direct Numerical Simulation of Turbulence on Supercomputers	67
<i>Kirill V. Belyaev, Andrey V. Garbaruk, Mikhail L. Shur, Mikhail Kh. Strelets, and Philippe R. Spalart</i>	
GPU-Accelerated Molecular Dynamics: Energy Consumption and Performance.	78
<i>Vyacheslav Vecher, Vsevolod Nikolskii, and Vladimir Stegailov</i>	
Implementation and Evaluation of the PO-HEFT Problem-Oriented Workflow Scheduling Algorithm for Cloud Environments	91
<i>Gleb Radchenko, Ivan Lyzhin, and Ekaterina Nepovinnyyh</i>	
Layer-by-Layer Partitioning of Finite Element Meshes for Multicore Architectures.	106
<i>Alexander Novikov, Natalya Piminova, Sergey Kopysov, and Yulia Sagdeeva</i>	

Multilevel Parallelization: Grid Methods for Solving Direct and Inverse Problems	118
<i>Sofya S. Titarenko, Igor M. Kulikov, Igor G. Chernykh, Maxim A. Shishlenin, Olga I. Krivorot'ko, Dmitry A. Voronov, and Mark Hildyard</i>	
Numerical Model of Shallow Water: The Use of NVIDIA CUDA Graphics Processors.	132
<i>Tatyana Dyakonova, Alexander Khoperskov, and Sergey Khrapov</i>	
Parallel Algorithm for Simulation of Fragmentation and Formation of Filamentous Structures in Molecular Clouds	146
<i>Boris Rybakin, Nikolai Smirnov, and Valery Goryachev</i>	
Parallel Algorithms for a 3D Photochemical Model of Pollutant Transport in the Atmosphere.	158
<i>Alexander Starchenko, Evgeniy Danilkin, Anastasiya Semenova, and Andrey Bart</i>	
Parallel Computation of Normalized Legendre Polynomials Using Graphics Processors	172
<i>Konstantin Isupov, Vladimir Knyazkov, Alexander Kuvaev, and Mikhail Popov</i>	
Parallel Software for Simulation of Nonlinear Processes in Technical Microsystems	185
<i>Sergey Polyakov, Viktoriia Podryga, Dmitry Puzyrkov, and Tatiana Kudryashova</i>	
Performance of MD-Algorithms on Hybrid Systems-on-Chip Nvidia Tegra K1 & X1	199
<i>Vsevolod Nikolskii, Vyacheslav Vecher, and Vladimir Stegailov</i>	
Revised Pursuit Algorithm for Solving Non-stationary Linear Programming Problems on Modern Computing Clusters with Manycore Accelerators	212
<i>Irina Sokolinskaya and Leonid Sokolinsky</i>	
Solving Multidimensional Global Optimization Problems Using Graphics Accelerators.	224
<i>Konstantin Barkalov and Ilya Lebedev</i>	
Supercomputer Simulation of Physicochemical Processes in Solid Fuel Ramjet Design Components for Hypersonic Flying Vehicle	236
<i>Vadim Volokhov, Pavel Toktaliev, Sergei Martynenko, Leonid Yanovskiy, Aleksandr Volokhov, and Dmitry Varlamov</i>	

The Future of Supercomputing: New Technologies

Addition for Supercomputer Functionality	251
<i>Gennady Stetsyura</i>	
Analysis of Processes Communication Structure for Better Mapping of Parallel Applications	264
<i>Ksenia Bobrik and Nina Popova</i>	
Experimental Comparison of Performance and Fault Tolerance of Software Packages Pyramid, X-COM, and BOINC	279
<i>Anton Baranov, Evgeny Kiselev, and Denis Chernyaev</i>	
Internet-Oriented Educational Course “Introduction to Parallel Computing”: A Simple Way to Start	291
<i>Victor Gergel and Valentina Kustikova</i>	
Parallel Computational Models to Estimate an Actual Speedup of Analyzed Algorithm	304
<i>Igor Konshin</i>	
Techniques for Solving Large-Scale Graph Problems on Heterogeneous Platforms	318
<i>Ilya Afanasyev, Alexander Daryin, Jack Dongarra, Dmitry Nikitenko, Alexey Teplov, and Vladimir Voevodin</i>	
The Elbrus Platform Feasibility Assessment for High-Performance Computations	333
<i>Ekaterina Tyutlyaeva, Sergey Konyukhov, Igor Odintsov, and Alexander Moskovsky</i>	
Using Machine Learning Methods to Detect Applications with Abnormal Efficiency	345
<i>Denis Shaykhislamov</i>	
Using Simulation for Performance Analysis and Visualization of Parallel Branch-and-Bound Methods	356
<i>Yury Evtushenko, Yana Golubeva, Yuri Orlov, and Mikhail Posypkin</i>	
Author Index	369

Supercomputing

Second Russian Supercomputing Days, RuSCDays

2016, Moscow, Russia, September 26–27, 2016,

Revised Selected Papers

Voevodin, V.; Sobolev, S. (Eds.)

2016, XV, 370 p. 166 illus., Softcover

ISBN: 978-3-319-55668-0