NUMGRID 2024

Conference location: Auditorium 727, INM RAS, Moscow, Gubkina str. 8

Monday, December 16

Computational Electrodynamics

9:50–10:00	**Opening**
10:00–10:30	Method of surface and volume integral equations for problems of electrodynamics in thin structures using prismatic grids **A. Setukha**, I. Mass *Moscow State University*
10:30–11:00	Two-mesh segregated discretization for a coupled electromechanical problem **A. Liogky**, A. Danilov, F. Syomin *Institute of Numerical Mathematics RAS*
11:00–11:30	**Free discusions (coffee break)**

Computational Photolithography I

11:30–12:00	On the application of inverse photolithography in the problem of local defect elimination **S. Kobelkov**, S. Rodin, M. Silakov, N. Elistratov *Moscow State University*
12:00–12:30	Design and processing of curvilinear structure layouts for high-precision binary photomasks **M. Fedonin**, I. Bakulin *Research Institute of Measurement Systems RFNC–VNIIEF*
12:30–13:00	Resolution enhancement technology in photolithography and variability of ILT solutions **V. Garanzha**, A. Belokrys-Fedotov, I. Kaporin, L. Kudryavtseva *Computing Center FRC CSC RAS* V. Stupnikov, I. Fedorov, S. Belousov *PJSC Sberbank* M. Fedonin, E. Chepurin *Research Institute of Measurement Systems RFNC–VNIIEF*
13:00–14:00	**Lunch break**

Computational Photolithography II

14:00–14:30	Approximate solution of systems of linear inequalities with binary variables **I. Kaporin** *Computing Center FRC CSC RAS*
14:30-15:00	Machine learning methods for gradient estimation in inverse lithography problems **D. Shchepetov**, I. Kaporin, V. Garanzha, A. Gorinov *Computing Center FRC CSC RAS*
15:00-15:30	PINN-model of the photoresist exposure taking into account post-exposure resist baking and development *(online presentation)* M. Gorodnichev, A. Kireeva, S. Kireev, I. Marinin, **M. Marchenko**, Y. Medvedev, E. Rodyakina, S. Sitnikov, D. Shcheglov *Novosibirsk State University Center for AI*
15:30-16:00	Use of AI in creating lithographic process simulation models in inverse lithography problems **Ya. Nikolaev**, A. Koshlakov *PJSC Sberbank, Moscow Institute of Physics and Technology* A. Metelnikov, I. Fedorov *PJSC Sberbank*
16:00–16:30	**Free discusions (coffee break)**
16:30–18:30	**Round table discussions on computational photolithography**

Tuesday, December 17

Mesh Generation I

9:30 – 10:00	Automatic unstructured mesh generator for tsunami wave modeling in the LOGOS software package prepostprocessor **N. Chukhmanov**, O. Borisenko, D. Smolkina, M. Cherenkova, M. Kuzmenko, A. Giniyatullina, T. Timayeva *RFNC–VNIIEF*
10:00–10:30	Adaptive grids and numerical algorithms for solving problems with a variable diffusion coefficient, small parameter and turning points *(online presentation)* **V. Liseikin** *FRC ICT RAS* V. Gupta *The LNM Institute of Information Technology* S. Karasuljić *University of Tuzla* S.K. Sahoo *Silicon University*
10:30–11:00	Application of Chimera overlapped meshes in solving the elastic wave equation N. Khokhlov, A. Favorskaya, I. Petrov *Moscow Institute of Physics and Technology* *Institute for System Analysis FRC CSC RAS* **E. Pesnya** ***Moscow Institute of Physics and Technology***
11:00–11:30	**Free discusions (coffee break)**

CAD/CAE

11:30-12:00	An overview: C3D Toolkit for integration of grid generation with CAD/CAE **A. Lonin** *C3D Labs*
12:00-12:30	A universal geometric kernel based on implicit complexes. Application to geological modeling problems **E. Kartasheva** *Institute of Applied Mathematics RAS*
12:30–13:00	Polygonal modeling in CAD and block-structured meshing **V. Garanzha**, L. Kudryavtseva, V. Shirobokov *Computing Center FRC CSC RAS* V. Guriev *Sarov Branch of the Moscow State University*
13:00–14:00	**Lunch break**

Mesh Generation II

14:00–14:30	Quasi-structured surface meshes based on transfinite interpolation **M. Ermakov** *Institute for Problems in Mechanics RAS*
14:30–15:00	Algorithms for surface mesh preparation during construction of unstructured polyhedral meshes for thin-walled structures in the LOGOS software package **D. Pankratov**, O. Borisenko, E. Evstifeeva, A. Larkin, T. Tsalko, A. Shavkhitdinova *RFNC–VNIIEF*
15:00–15:30	Generation of unstructured adaptive meshes with size specified by the multi-grid method *(online presentation)* **Jie Cao**, Zhenbo Li *University of South China* Zhenqun Guan *Dalian University of Technology*
15:30–16:00	**Free discusions (coffee break)**

Numerical Modeling

16:00–16:30	On multiphase fluid flow modelling in porous media using projection method **K. Terekhov**, Yu. Vassilevski *Institute of Numerical Mathematics RAS* S. Malliasov *Sirius University*
16:30–17:00	General finite-volume framework and algebraic multigrid method for multiphysics problems **K. Terekhov**, I Konshin, Yu. Vassilevski *Institute of Numerical Mathematics RAS*
17:00–17:30	Higher order numerical solution of the incompressible Navier-Stokes equations in moving domains: finite elements vs. finite volumes **Yu. Vassilevski**, K. Terekhov, A. Danilov, A. Lozovskii *Institute of Numerical Mathematics RAS*
17:30–18:00	**Free discusions (coffee break)**
18:00–19:30	**Round table discussions on mesh generation, CAD and CAE**
19:30–19:45	**Closing**