

MATHEMATICAL METHODS OF SOLUTION TO ELECTRODYNAMICS PROBLEMS

Founded in 2002.

Head of the research group: **Yuriy Gennadyevich SMIRNOV**, Doctor of Physical and Mathematical Sciences, Professor.

Members of the research group: A. A. Tsupak, PhD in Physics and Mathematics, Associate Professor; S. N. Kupriyanova, PhD in Physics and Mathematics, Associate Professor; M.Yu. Medvedik, PhD in Physics and Mathematics; I. A. Dolgarev, PhD in Physics and Mathematics; **D. V. Valovik**, PhD in Physics and Mathematics; I. A. Rodionova, PhD in Physics and Mathematics; E. A. Khorosheva, PhD in Physics and Mathematics; D. A. Mironov, PhD in Physics and Mathematics; D. I. Vasyunin, PhD in Physics and Mathematics; E. E. Grishina, PhD in Physics and Mathematics; E. Yu. Smolkin, PhD in Physics and Mathematics; E. D. Derevyanchuk, PhD in Physics and Mathematics; M. A. Moskaleva, PhD in Physics and Mathematics.

The research group was organised in 2002, when PSU became the first university in Penza to offer one of the oldest university study fields – Mathematics. **Yu. G. Smirnov**, Doctor of Physical and Mathematical Sciences, has led the group since its inception.

Yu. G. Smirnov is a reviewer in the *Mathematical Reviews* International Mathematical Journal. He has given presentations at 40 research conferences and seminars in Russia and abroad, including the Oberwolfach Research Institute for Mathematics, universities in Stuttgart, Tokyo, Osnabrück, Karlstad, Gothenburg, and others.

Yu. G. Smirnov has received grants from the President of the Russian Federation as a young Doctor of Sciences, as well as from the Russian Foundation for Basic Research, the Russian Research Foundation, the Ministry of Education and Science of the Russian Federation, the Volkswagen Foundation in Germany, the Royal Swedish Academy of Sciences, and many others.

Under the leadership of **Yu. G. Smirnov**, the research group has received over 30 grants, including from international research organisations. The group is a regional leader in research in supercomputer simulation and supercomputer calculations,

and collaborates with universities in the USA, Japan, Germany, Sweden, as well as the Faculty of Computational Mathematics and Cybernetics at M. V. Lomonosov Moscow State University and the Institute of Numerical Mathematics of the Russian Academy of Sciences.

The research group’s main research areas are as follows:

- 1. Mathematical methods for solving boundary value problems in electrodynamics, acoustics, and optics.
- 2. Theory of operator bundles and operator functions.
- 3. Integro-differential and pseudo-differential equations.
- 4. Nonlinear eigenvalue problems.
- 5. Numerical methods for solving direct and inverse problems of mathematical physics.
- 6. Parallel computational algorithms and solving problems on supercomputers.

The research group has published over 350 scientific works, including 11 monographs (6 of them in English) and training manuals. In addition, the group has received 10 certificates of state registration of intellectual property. The group’s scientific results are well known both in Russia and internationally. They have been presented at international symposia and conferences in Germany, France, the USA, Japan, Sweden, Greece, China, Finland, Italy, and other countries.

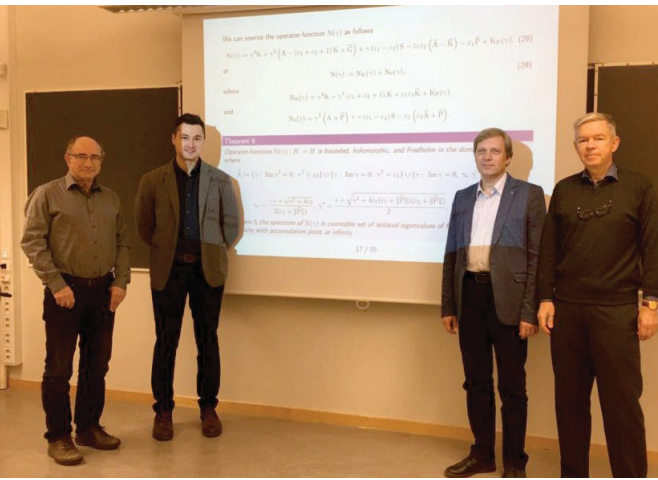
The group’s research activities are carried out at the Research Centre for Supercomputer Simulation in Electrodynamics, which supports the entire innovation cycle, from fundamental research and applied developments to the creation of new technologies. Research and technological partnerships with European research organisations provide favourable conditions for promoting knowledge-intensive products in international markets.

The group prepares specialists who can build their academic careers in basic science and work as university teachers or scientific workers in research and technological enterprises.

15 dissertations were defended in the group’s research field, including a Doctor of Science dissertation.



Research group members at PIERS 2017 International Symposium



Yu. G. Smirnov and E. Yu. Smolkin at the Conference 'Engineering Health – The Legacy of William Chalmers', Gothenburg, Sweden