

International Conference

Days on Diffraction 2024

June 10 – 14, 2024

St. Petersburg

Program

(draft 17/05/24)

Monday, June 10, 2024

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| | <i>Asymptotic methods (I)</i> Chair: Sergey Dobrokhotov |
| 11.00 | Nazarov S.A.: Asymptotics of spectrum of the Dirichlet problem with a row of small concentrated masses |
| 11.20 | Allilueva A.I., A.I. Shafarevich: Quasi-classical asymptotics describing the electron-hole interaction and the Klein effect for the (2+1)-Dirac equation in discontinuously varying fields |
| 11.40 | I. Bogaevskii, M. Rouleux: Glancing points and asymptotic solutions |
| 12.00 | Andrey Matskovskiy, German Zavorokhin: On elastic waves in topographic waveguides |
| 12.20 | Borisov D.I.: On negative eigenvalues of toy graph with small edge |
| 12.40 | <i>Coffee break</i> |
| | <i>Asymptotic methods (II)</i> Chair: Maria Perel |
| 13.00 | S.Yu. Dobrokhotov, D.S. Minenkov, M.M. Votikova: Long nonlinear water waves in “whispering galleries” formed by gentle shores |
| 13.20 | Shafarevich A.I., Shchegortsova O.A.: Isotropic surfaces and complex vector bundles corresponding to the Schrödinger equation with a delta potential |
| 13.40 | Shafarevich A.I., Rykhlov V.V.: Spectral series of the Schrödinger operator with double delta potential on a three-dimensional spherically symmetric manifold |
| 14.00 | Zlobina E.A., Kiselev A.P., Fedorov N.S.: Paraxial wave propagation along a delta potential |
| 14.20 | Tsvetkova A.V.: Localized Gaussian beams and asymptotics of solutions of the Helmholtz equation |

Tuesday, June 11, 2024

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| | <i>Diffraction</i> Chair: Victor Zalipaev |
| 11.40 | Shanin A.V., Korolkov A.I., Makarov O.I.: Diffraction by a Dirichlet $\pi/3$ wedge on a hexagonal lattice |
| 12.00 | Korolkov A.I., Shanin A.V., Laptev A.Y.: Mortar coupling between FEM and BAE with non-conforming meshes and its applications to diffraction modeling |
| 12.20 | V.D. Burtsev, T.S. Vosheva, A.P. Sedov, A.V. Nikulin, D.S. Filonov: Miniature Mobius strip inspired scatterer |

12.40 ***Coffee break***

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| | <i>Optics (I)</i> Chair: Nikolay Rosanov |
| 13.00 | Bronnikov K.A., Solodovchenko N.S., Chetverikova A.P., Limonov M.F.: Hot spots and field focusing in dielectric ring resonators |
| 13.20 | Lapin B.P., Barshak E.V., Yavorsky M.A., Alexeyev C.N.: Optical vortices in multihelicoidal fibers with torsional mechanic stress |
| 13.40 | Vikulin D.V., Barshak E.V., Alexeyev C.N., Lapin B.P., Yavorsky M.A.: All-fiber generation and control of higher-order optical beams via lowest-order flexural acoustic wave |
| 14.00 | V. Zalipaev, I. Bubenchikov, A. Tityapkin, S. Kozlov: Diffraction of a video pulse |

14.20 ***Coffee break***

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| | <i>Optics (II)</i> Chair: Aleksei Kiselev |
| 14.40 | N.N. Rosanov: "Violations" and violations of relations for the electrical area of short electromagnetic pulses |
| 15.00 | Veretenov N.A., Fedorov S.V., Rosanov N.N., Fedorov S.V., Rosanov N.N.: 3D optical vector soliton with crossed vortex lines |
| 15.20 | Plachenov A.B.: Unidirectional pulses |

Wednesday, June 12, 2024

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| | <i>Acoustics and elastic waves (I)</i> Chair: Evgeny Glushkov |
| 11.20 | Evdokimov A.A., Vareldzhan M.V., Eremin A.A.: Scattering of fundamental elastic guided waves by localized 3D obstacles in bimaterial isotropic laminates |
| 11.40 | Ermolenko O.A., Glushkov E.V., Glushkova N.V.: Ultrasonic inspection of fluid-loaded anisotropic laminate plates |
| 12.00 | Fomenko S.I., Golub M.V., Usov P.E.: Guided wave propagation control in multilayered piezoelectric waveguide by system of electrodes connected via electrical circuit |
| 12.20 | Golub M.V., Fomenko S.I., Doroshenko O.V., Kozhevnikov V.V., Okoneshnikova E.A., Kanishchev K.K.: Semi-analytical methods for modelling elastic wave conversion, trapping and focusing in layered elastic metamaterials with arrays of voids |

12.40 ***Coffee break***

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| | <i>Acoustics and elastic waves (II)</i> Chair: Maria Wilde |
| 13.00 | Filippenko G.V.: Axisymmetric vibrations of a cylindrical elastic shell with inhomogeneous Poisson's ratio |
| 13.20 | Khanazaryan A.D., Golub M.V., Makarenko A.A.: Hybrid semi-analytical method for modelling in-plane wave motion of elastic laminates with periodic and localized volumetric inhomogeneities |
| 13.40 | D.D. Zakharov, I.S. Nikitin: Implementation of the Peano and WKB approaches to find vibrational modes and frequencies of a thin rod with variable parameters |
| 14.00 | Zhuchkova M.G.: Scattering of surface waves by linear discontinuities in elastic half-space: approximate approach |

14.20 ***Coffee break***

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| | <i>Acoustics and elastic waves (III)</i> Chair: Mikhail Golub |
| 14.40 | Glushkov E.V., Glushkova N.V., Kiselev O.N.: Source energy distribution and wave energy streamlines in an elastic anisotropic half-space |
| 15.00 | Wilde M.V., Pleshkov V.N.: On distinguishing between bending edge wave and Lamb wave A0 in the wave-fields excited by an edge load |
| 15.20 | Glushkov E.V., Glushkova N.V., Tatarkin A.A.: Guided waves and resonance effects in piezoelectric laminate structures |
| 15.40 | Oleg V. Motygin: Non-uniqueness in the water wave problem for partially submerged bodies and an ice plate floating on the surface |

Thursday, June 13, 2024

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| | <i>Mathematical methods</i> Chair: Anna Tsvetkova |
| 12.00 | Babich M.V.: On Jordan structure of matrices from Lie algebra complex orthogonal group $so(N, C)$ |
| 12.20 | Ivanov A.V.: Solutions to difference Riccati equation via continued fractions |
| 12.40 | Pavlov Yu.V., Gai'kov A.L.: Some solutions of nonlinear wave equations with first derivatives |
| 13.00 | Maxim N. Demchenko: On the scattering problem for the nonhomogeneous ultrahyperbolic equation |
| 13.20 | Ghazaryan A.M., Ishkhanyan A.M.: A conditionally exactly solvable 1D Dirac pseudoscalar interaction potential |

13.40 ***Coffee break***

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| | <i>History of diffraction</i> Chair: Andrei Shanin |
| 14.00 | Innocenzo M. Pinto: Ray chaos and its short wave footprints — old and new paradigms |
| 14.20 | Kiselev A.P., Zlobina E.A. : Parabolic-equation approach in high-frequency grazing diffraction theory: from Fock to nowadays |
| 14.40 | Pavel Belov: Metamaterials in Russia and former USSR |
| 15.00 | Limonov M.F., Samusev K.B.: History of diffraction in natural and synthetic opals |

Friday, June 14, 2024

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| | <i>Numerical approaches</i> Chair: Leonid Goray |
| 11.00 | Feshchenko R.M.: On cylindrically symmetrical exact transparent boundary condition in cylindrical computational domain |
| 11.20 | Farafonov V.G., Turichina D.G., Il'in V.B., Laznevoi S.I.: Some new results of applying the separation of variables method to spheroids |
| 11.40 | Goray L.I., Dashkov A.S., Kostromin N.A., Barykin D.A.: An improved numerical algorithm for the wave equation optimization problems |
| 12.00 | Maslovskaya A.G., Moroz L.I.: Fractional diffusion-wave modification of Landau–Khalatnikov model applied to polarization switching in ferroelectric nanowires |
| 12.20 | Goray L.I.: Anomalously high diffraction efficiency of low-frequency sinusoidal and lamellar gratings for neutron optics |

12.40 ***Coffee break***

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| | <i>Electromagnetics & radiophysics</i> Chair: Tatiana Zaboronkova |
| 13.00 | Ivanova, E.A., Müller, W.H., Rickert, W., Vilchevskaya, E.N.: Wave processes in conducting media from the point of view of classical and extended electrodynamics |
| 13.20 | Kudrin A.V., Zaitseva A.S., Zaboronkova T.M.: Electrodynamics characteristics of a multigap loop antenna with phased excitation located on the surface of an anisotropic cylinder |
| 13.40 | Chalyshov G.V., Dyundyaeva A.A., Valovik D.V.: Nonstandard perturbation approach to find nonlinearized solutions in a problem of electromagnetic wave propagation in a plane waveguide with nonlinear filling |
| 14.00 | Bazhilova E.V., Kudrin A.V., Zaboronkova T.M., Zaitseva A.S.: Whistler wave radiation from a circular phased array of loop antennas in a magnetoplasma |
| 14.20 | V. ZalipaeV: Surface waves generation by array of thin wires in the presence of impedance surface of metallic grid |