

International Conference

Days on Diffraction 2023

June 5 – 9, 2023

St. Petersburg

Program

Monday, June 5, 2023

	<i>Localized waves</i> Chair: Nikolay Rosanov
11.00	Lapin B.P. , Barshak E.V., Vikulin D.V., Alexeyev C.N., Yavorsky M.A.: Dispersion of optical vortices in twisted elliptical optical fibers with torsional mechanical stresses
11.20	Fedorov S.V., Rosanov N.N., Veretenov N.A. : 3D-topological vector solitons in laser media
11.40	Vikulin D.V. , Barshak E.V., Alexeyev C.N., Lapin B.P., Yavorsky M.A.: Generation of higher-order optical vortices in acoustically perturbed optical fibers
12.00	Plachenov A.B., Rosanov N.N. : Electromagnetic pulses in vacuum and in vacuum with charges
12.20	Gladky A.A. , Rosanov N.N., Veretenov N.A.: Self-induced transparency in gradient waveguides
12.40	Coffee break
	<i>Partial differential equations</i> Chair: Aleksei Kiselev
13.00	Gaikov A.L., Pavlov Yu.V. : On the method of functionally invariant solutions for nonlinear wave equations
13.20	Maxim N. Demchenko : The analogue of advanced and retarded fundamental solutions for ultrahyperbolic equation
13.40	A.E. Merzon , P.N. Zhevandrov, J.E. De La Paz Méndez, M.I. Romero Rodríguez: Sommerfeld-type solution of a BVP for the Helmholtz equation in a nonconvex angle with periodic boundary data
14.00	Nikolay Kuznetsov , Oleg Motygin: 2-dimensional sloshing: examples of domains with interior 'high spots'

Tuesday, June 6, 2023

	<i>Diffraction</i> Chair: Andrei Shanin
11.20	Simakov E.S. , Galyamin S.N., Tyukhtin A.V.: Diffraction of a symmetric TM mode at an open-ended deeply corrugated circular waveguide with a flange
11.40	Ekaterina A. Zlobina , Aleksei P. Kiselev: Boundary layer approach to diffraction by contours with non-smooth curvature
12.00	Mikhail A. Lyalinov , Svetlana S. Polyanskaya: An edge wave propagating along an angular junction of two semi-infinite membranes bounding an acoustic medium
12.20	Kniazeva K.S. , Saito Yo., Shanin A.V., Korolkov A.I.: Saddle point method interpretation of forerunners in car tires

12.40 ***Coffee break***

	<i>Mathematical approaches of wave propagation</i> Chair: Dmitry Valovik
13.00	Kondyrev O.V., Martynova V.Yu., Tikhov S.V. : A monochromatic coupled TE-TE wave propagation in a plane shielded waveguide filled with anisotropic nonlinear medium
13.20	Yuldashev P.V. , Konnova E.O., Khokhlova V.A.: Separable representation of three-dimensional wide-angle parabolic equation propagator using Fourier series
13.40	Feshchenko R.M. : On expression of the field in the 3D space through its values on the outer surface of a rectangular prism in parabolic approximation
14.00	Valovik D.V. , Zarembo E.V.: Propagation of a two-frequency electromagnetic wave in a plane waveguide with nonlinear permittivity: nonlinearizable guided waves

14.20 ***Coffee break***

	<i>Electromagnetics & radiophysics</i> Chair: Tatiana Zaboronkova
14.40	Kudrin A.V., Ostafiychuk O.M. , Zaboronkova, T.M.: Whistler modes of a radially nonuniform cylindrical duct with enhanced density in a nonresonant magnetoplasma
15.00	Yashina N.F. , Zaboronkova T.M.: Resonance interaction of VLF waves guided by a cylindrical density trough in a magnetoplasma
15.20	Farafonov V.G., Il'in V.B. , Turichina D.G.: Light scattering calculations for multilayered spheroids using spherical and spheroidal bases
15.40	Bazhilova E.V., Kudrin A.V., Zaboronkova T.M. , Zaitseva A.S.: Radiation characteristics of a rotating electric dipole in a magnetoplasma

Wednesday, June 7, 2023

	<i>Asymptotic methods (I)</i> Chair: Alexandr Fedotov
11.20	Shafarevich A.I., Shchegortsova O.A. : Maslov complex germ in the Cauchy problem for the Schrödinger equation with delta potential
11.40	Ilya Bogaevsky, Michel Rouleux : Lagrangian intersections and typical transitions of phase in semi-classical approximations
12.00	Erbaş B., Ege N., Perel M.V. : Adiabatic normal modes in an irregular elastic waveguide resting on a Winkler foundation
12.20	Kalyakin L.A. : Perturbation of a simple wave: from simulation to asymptotics
12.40	Coffee break
	<i>Asymptotic methods (II)</i> Chair: Michel Rouleux
13.00	Allilueva A.I. : Asymptotic solutions of the wave equation with abruptly varying velocity
13.20	Dobrokhotov S.Yu. : Effective asymptotics of stationary (pseudo)differential equations with spatially localized right-hand sides
13.40	Fedotov A.A. : Complex WKB method and topological phase
14.00	Ivanov A.V. : Interfering circle combs and uniform hyperbolicity of cocycles
14.20	Coffee break
	<i>Asymptotic methods (III)</i> Chair: Sergey Dobrokhotov
14.40	Sergeev S.A. , Minenkov D.S., Kuritsina E.A.: Localized asymptotic eigenfunctions for the Laplacian inside the torus
15.00	Dobrokhotov S.Yu., Bogaevsky I.A., Tolchennikov A.A. : Asymptotics of the fundamental solution of 2D Helmholtz equation with a linear refractive index and asymptotics of solution of this equation with a localized right hand side
15.20	Dobrokhotov S.Yu., Nazaikinskii V.E., Tsvetkova A.V. : Long nonlinear coastal waves and billiards with semi-rigid walls
15.40	Babich M.V. : On symplectic filtration of (co)adjoint orbit of complex orthogonal group in nilpotent case
16.00	Lecian O.M., Tirozzi B.B. : Analyses of stellar dynamics of virialised system

Thursday, June 8, 2023

	<i>Acoustics and elastic waves (I)</i> Chair: Mikhail Golub
11.20	Sokolov M.I. , Mozhaev V.G.: Change in the velocity invariants of bulk acoustic waves in piezoelectric crystals
11.40	Glushkov E.V. , Glushkova N.V., Kiselev O.N.: Body wave asymptotics for an anisotropic elastic half-space with a surface source
12.00	Fomenko S.I. , Jana R.B.: The influence of porosity and gradient of water saturation of soils on surface acoustic waves
12.20	Kharitonov A.A. , Mozhaev V.G.: Solitons in model systems with the same dispersion law as for Krauklis or Kononkov waves
12.40	<i>Coffee break</i>
	<i>Acoustics and elastic waves (II)</i> Chair: Maria Wilde
13.00	<i>cancelled</i>
13.20	Golub M.V. , Doroshenko O.V., Fomenko S.I., Kozhevnikov V.V., Okoneshnikova E.A.: The advanced boundary integral equation method for modelling wave motion in laminates with doubly periodic arrays of cracks
13.40	Ermolenko O.A. , Glushkov E.V., Glushkova N.V.: Resonance method for monitoring osteoporosis changes in bone tissue
14.00	<i>cancelled</i>
14.20	<i>Coffee break</i>
	<i>Acoustics and elastic waves (III)</i> Chair: Evgeny Glushkov
14.40	Nazarov S.A. : Localization of natural oscillation of thin elastic gaskets
15.00	Wilde M.V. , Pleshkov V.N.: Modeling of the retroreflective film influence on the dispersion curves and attenuation of guided waves in an aluminum plate
15.20	Oleg V. Motygin : Green's function of the two-dimensional water wave problem with an ice plate floating on the surface
15.40	Fomenko S.I. , Golub M.V.: Guided waves propagation in multilayered piezoelectric waveguide with electrodes connected via electrical circuit

Friday, June 9, 2023

	<i>Waveguides & chains</i> Chair: Serge Gavrilov
11.00	Gavrilov S.N. , Shishkina E.V., Mochalova Yu.A.: An example of the anti-localization of non-stationary quasi-waves in a 1D semi-infinite harmonic chain
11.20	Kazak M.S. , Petrova T.N., Petrov P.S.: On the application of the generalized WKB method for acoustic field modelling in underwater acoustics
11.40	Petrov P.S. , Ehrhardt M., Kozitskiy S.B., Tyshchenko A.G., Kozitskiy, S.B., Tyshchenko, A.G.: Pseudodifferential mode parabolic equation with mode coupling
12.00	Andrey Matskovskiy, German Zavorokhin , Pavel Petrov: Investigation of the analytical properties of solutions to dispersion equations for waveguide acoustic media with linear variation of the squared refractive index
12.20	Galyamin S.N. : Radiation of a charged particle bunch exiting an open-end of a dielectric-loaded circular waveguide

12.40 **Coffee break**

	<i>Numerical approaches</i> Chair: Leonid Goray
13.00	Kabardov M.M. , Sarafanov O.V.: Numerical analysis of the scattering of plane waves by two-dimensional diffraction gratings
13.20	Goray L.I. : X-ray echelles: rigorous account of groove profile deformations in diffraction efficiency electromagnetic calculus
13.40	Goray L.I., Dashkov A.S. , Kostromin N.A.: Development of a computation technique for solving the inverse heavy numerical problems
14.00	Maslovskaya A.G., Moroz L.I. : Computer-assisted time-fractional modeling of diffusion-wave polarization processes in ferroelectrics
14.20	Shanin A.V., Korolkov A.I., Laptev A.Y. : Taking into account thermoviscous boundary conditions in computational problems of acoustics

Program of the Mini-symposium “Inverse Problems”

Chairman: **Mikhail Belishev**

Monday, 5 June, 2023

09.55–10.00	Checking Zoom, greetings
10.00–10.40	Gen Nakamura : Resolvent estimates for viscoelastic systems and their applications
10.45–11.25	Rakesh : Fixed angle inverse scattering for velocity
<i>Coffee break</i>	
11.40–12.20	A. Timonov : On acoustic imaging via the quasi-reversibility and Boundary Control Methods

Lunch

14.00–14.40	A.E. Kovtanyuk , N.M. Park: Inverse extremum problem with phase constraints for a quasi-linear complex heat transfer model
14.45–15.25	K.V. Dmitriev : Possibilities of using the correlation-iterative approach to acoustic tomography of incoherent sources

Tuesday, 6 June, 2023

10.00–10.40	R.G. Novikov , I.A. Taimanov: On unitarity of the scattering operator in non-Hermitian quantum mechanics
10.45–11.25	M.I. Belishev, D.V. Korikov : Two-dimensional EIT problem for Riemannian surfaces
<i>Coffee break</i>	
11.40–12.20	A.S. Mikhaylov, V.S. Mikhaylov : Discrete dynamic inverse problem for complex Jacobi matrices

Lunch

14.00–14.40	A.Yu. Chebotarev , P.R. Mesenev: Inverse problem with unknown sources for a quasi-linear complex heat transfer model
14.45–15.25	M.I. Belishev, S.A. Simonov : A functional model of a class of symmetric semi-bounded operators

Wednesday, 7 June, 2023

10.00–10.40	L. Pestov , V. Nosikova, V. Filatova: Visualization of waves by the Boundary Control Method, numerical experiment
10.45–11.25	V.N. Sivkin : Approximate Lipschitz stability for phaseless inverse scattering
<i>Coffee break</i>	
11.40–12.20	N.P. Bondarenko : Method of spectral mappings for differential operators with distribution coefficients

Lunch

14.00–14.40	N.Yu. Saburova : Asymptotically isospectral periodic graphs
14.45–15.25	D.I. Borisov : On resolvent of Schrödinger operator on graph with small loops
<i>Coffee break</i>	
15.40–16.20	M.I. Belishev, A.V. Kaplun : Two canonical forms of the metric graph eikonal algebra and the graph geometry

Program of the Mini-symposium “Navier–Stokes system, parabolic equations and related topics” (dedicated to the 90th anniversary of Prof. V.A. Solonnikov)

Organized by **Irina V. Denisova**

Wednesday, 7 June, 2023

	Chairman of the session: Yoshihiro Shibata
10.30–10.55	Giga Y., Gu Z.: On the Helmholtz decomposition of BMO spaces of vector fields
10.55–11.20	Bizhanova G.I.: Investigation of the problems for the parabolic equations with the incompatible initial and boundary data
11.20–11.45	Plotnikov P.I.: Interaction of water waves with a viscoelastic ice sheet
11.45–12.10	Nazarov S.A.: Meliorated one-dimensional models of flow in a system of thin canals

Coffee break

	Chairman of the session: Yoshikazu Giga
12.30–12.55	Maremonti P.: Navier–Stokes equations: a new estimate of a possible gap related to the energy equality of a suitable weak solution
12.55–13.20	Pileckas K., Specovius M., Rauchhaus S.: Spatial behavior of solutions to the time periodic Stokes system in a three dimensional layer
13.20–13.45	Vivaldi M.A.: An evolution free boundary problem for the Navier–Stokes equations

Thursday, 8 June 8, 2023

	Chairman of the session: Pavel Plotnikov
10.30–10.55	Liu Y., Zhang P.: On the global stability of large Fourier mode for 3-D Navier–Stokes equations
10.55–11.20	Shibata Y.: L_1 -maximal regularity approach to the free boundary problem of the Navier–Stokes equations
11.20–11.45	Shimizu S., Ogawa T.: Free boundary problems of the incompressible Navier–Stokes equations in the critical Besov space
11.45–12.10	Shelukhin V.V.: Generalization of Navier–Stokes equations for two-phase flows and applications

Coffee break

	Chairman of the session: Paolo Maremonti
12.30–12.55	Antontsev S.N., Khompysh Kh.: Inverse problems for a Boussinesq system for incompressible viscoelastic fluids
12.55–13.20	Makarenko N.I., Makridin Z.V., Denisenko D.S.: Trapped modes of nonlinear dispersive waves
13.20–13.45	Denisova I.V., Solonnikov V.A.: Stability theory for the problem on rotation of a two-phase drop