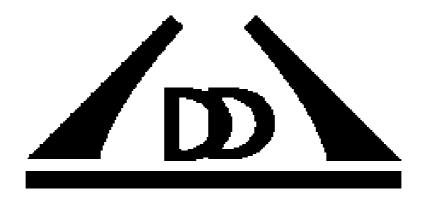
PROCEEDINGS of the International Conference



DAYS on DIFFRACTION 2010

 $\begin{array}{ll} June~8-11,~~2010\\ St.Petersburg,~~Russia \end{array}$

Proceedings of the International Conference "Days on Diffraction" 2010 June 8 – 11, 2010, St. Petersburg, Russia

edited by I. V. Andronov

A. P. KiselevM. V. PerelA. S. Kirpichnikova

University of St.Petersburg Mathematical Institute University of St.Petersburg University of Edinburgh, UK

The conference is sponsored by



Russian Foundation for Basic Research



 $\begin{array}{c} {\rm IEEE~ED/MTT/AP} \\ {\rm St.Petersburg~Chapter} \end{array}$



Russian Academy of Sciences

IEEE Catalog No.: CFP10489-PRT

ISBN: 978-5-9651-0529-8

- © Days on Diffraction Faculty of Physics, SPbU, 2010
- © Editor, I.V.Andronov, 2010

PREFACE

The International Conferences "Days on Diffraction" are annually held by the Faculty of Physics of St.Petersburg University, St.Petersburg Branch of V.A. Steklov Mathematical Institute and Euler International Mathematical Institute of the Russian Academy of Sciences.

Approximately 140 scientists from all over the world took part in the "Days on Diffraction - 2010" Conference. The Organizing Committee is thankful to all the participants. We appreciate their presentations which have been made during plenary, parallel and poster sessions. Our special gratitude is to the authors of 40 papers selected for publication in the *Proceedings*.

The Organizing Committee

Organizing Committee

Prof. V.M. Babich	St.Petersburg	Dr. A.S. Kirpichnikova (secretary),
Prof. V.N. Troyan	St.Petersburg	Prof. I.V. Andronov,
Prof. V.P. Smyshlyaev	UK	Prof. N.Ya. Kirpichnikova,
Prof. R. Stone	USA	Prof. M.A. Lyalinov,
Dr. N. Zhu	$\operatorname{Germany}$	Dr. E.V. Novikova,
Dr. M.V. Perel	St.Petersburg	N. Zalesskaya,
Prof. A.M. Samsonov		Prof. A.P. Kiselev

Address:

Prof. V.M. Babich
Prof. I.V. Andronov

Web site

babich@pdmi.ras.ru
iva---@list.ru

http://eimi.imi.ras.ru/dd/index.php

CONTENTS

Valeriy A. Abdulkadyrov The diffraction and dispersion of waves in the space-periodic structure with the 2-dimentional
electronic gas
Eron L. Aero, Anatolii N. Bulygin, Yurii V. Pavlov New approach to solution of sine-Gordon equation with variable amplitude
Tat'yana Yu. Alekhina, Andrey V. Tyukhtin Transition radiation in a waveguide with semi-bounded cold plasma
Atul Bhaskar
Dynamics of convecting elastic solids
V. V. Borzov, E. V. Damaskinsky Connection between representations of nonstandard and standard Chebyshev oscillators
Anders Boström, Karl Mauritsson, Peter D. Folkow Dynamic equations for an orthotropic plate
Vitaly V. Bulatov, Yury V. Vladimirov Wave dynamics of non-harmonic internal gravity wave in stratified ocean
A. Chrysostomou, I. Zorbas, E. Papkelis, P. Frangos Radio coverage simulation for three-dimensional urban environment using physical optics, physical theory of diffraction and the near-to-far-field transformation method
Vitalii N. Chukov Oscillations of statistical scattaring in Rayleigh limit
Aleksandr A. Ershov Asymptotics of the solution to the mixed boundary elliptic problem
George V. Filippenko Statement of the boundary-contact problems for the shells in acoustics
M. Ganesh, S. C. Hawkins Iterative algorithms for multiple electromagnetic scattering in three dimensions
Evgeny V. Glushkov, Natalia V. Glushkova, Mikhail V. Golub, Artem A. Eremin Trapped-mode, pass- and gap-band effects in waveguides with obstacles
Mikhail V. Golub, Anders Boström Spring boundary conditions and modeling of 2D wave propagation in composites with imperfect interfaces
Maxim A. Ilyasov Seismic data processing in terms of locally supported wavelets
Jevgenijs Jegorovs On the extension of the wave based method85
Victor F. Kravchenko, Dmitry V. Churikov New analytical WA-systems of Kravchenko functions
Victor F. Kravchenko, Dmitry V. Churikov Radial atomic functions in digital signal processing
Valeri V.Kucherenko Linearized system of magnetohydrodynamics for the ideal incompressible fluid

Speaker is given in bold.

Alexander V. Kudrin, Natalya M. Shmeleva, Orsolya E. Ferencz, Tatyana M. Zaboronkova Excitation of electromagnetic waves by a pulsed ring current in a magnetoplasma106
A.G. Kyurkchan, N.I. Smirnova Pattern equation method as an alternative to T-matrix method
Victor G. Lapin Non-stationary multiple scattering of electromagnetic wave in smoothly non-uniform isotropic plasmas, disturbed by powerful electromagnetic impulse
Makin V. S., Silantjeva I. A., Makin R. S. Qualitative model for nanostuctures formation in semiconductor material along femtosecond laser beam direction
German A. Maximov, Vladimir A. Larichev Shear viscosity as a result of angular momentum relaxation at hydrodynamical description128
Alexandr B. Plachenov Explicit formulae for higher modes of a nonplanar cavity with odd number of mirrors131
Danila A. Prikazchikov The asymptotic model for surface wave
A. D. Rawlins High frequency diffraction of an electromagnetic plane wave by an imperfectly conducting rectangular cylinder
Ilya A.Shereshevskii, Igor M.Nefedov The numerical method for 2D Helmholtz equation in complicated regions
Oleg V. Soldatenko Active protection from noise propagating in a cylindrical waveguide
Olga Strizhenko, Maxim Kolmakov Simulation of a laminar flow in a porous medium
Igor A. Timoshchenko, Ceorge G. Borzdov Vectorial laser beams radiation pressure on (1+3)-level neutral atoms
Andrey V. Tyukhtin, Emma G. Doil'nitsina Effective permittivity of a structure of coated wires
Andrei B. Utkin Modal representation of transient waves constrained by an elliptical cylinder
Valery Yu. Valyaev, Andrey V. Shanin Derivation of modified Smyshlyaev's formulae using integral transform of Kontorovich-Lebedev type
Nadezhda K. Vdovicheva, Ilya A. Shereshevskii The numerical calculation of eigen modes of rectangular electrodynamic waveguide with metal partition
Z. A. Yanson On the asymptotics of whispering gallery waves for crystal groups with even order axes of symmetry
Natalya F. Yashina, Tatyana M. Zaboronkova Instability of the electromagnetic surface waves supported by the bianisotropic column in dielectric medium

Dmitrii D. Zakharov, Alexandr V. Kaptsov
Resonance properties of wave propagation in the heterogeneous composites with nematic coat-
ings
Dmitrii D.Zakharov
High order asymptotics of the near field, radiated by a normal or angled beam fluid couple ultrasonic transducer, into an elasic plate or a half-space
Mounir G. Zeitouny, Moxi Cui, Nandini Bhattacharya, H. Paul. Urbach, Steven A. van den
Berg, Augustus J. E. M. Janssen
Stationary phase based asymptotic analysis of inter-pulse interference from a frequency comb
source in dispersive media
Auguor index