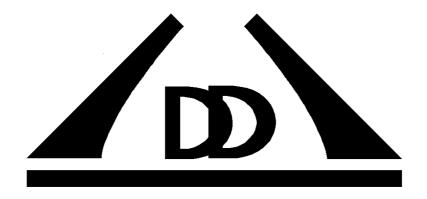
PROCEEDINGS of the International Conference



DAYS on DIFFRACTION 2007

May 29 – June 1, 2007 St.Petersburg, Russia Proceedings of the International Conference "Days on Diffraction" 2007 May 29 – June 1, 2007, St.Petersburg, Russia

edited by I. V. Andronov

V. M. Babich V. E. Grikurov A. P. Kiselev M. A. Lyalinov

M. V. Perel

University of St.Petersburg Mathematical Institute University of St.Petersburg Mathematical Institute University of St.Petersburg University of St.Petersburg

The seminar is sponsored by



Russian Foundation for Basic Research



IEEE ED/MTT/AP St.Petersburg Chapter



Russian Academy of Sciences

IEEE Catalog No.: 07EX1859

ISBN: 5-9651-0118-X

© Days on Diffraction Faculty of Physics, SPbU 2007

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 - 2007" 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 31 papers selected for publication in the *Proceedings* for preparation of their manuscripts in accordance with the required rules.

The Organizing Committee

Organizing Committee

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

Address:

Prof. V.M. Babich
Dr. V.E. Grikurov
Dr. I.V. Andronov

Web site

babich@pdmi.ras.ru
grikurov@math.nw.ru
iva---@list.ru

http://math.nw.ru/DD

CONTENTS

Ε.	G. Abramochkin, V. G. Volostnikov Wigner distribution function and intensity integral moments of Hermite-Laguerre-Gaussian beams
Μ.	. M. Arakelyan, K. T. Avetyan, E. A. Nazaryan Features of propagation and interaction of one-dimensional topological solitons in crystals10
Α.	G. Athanassoulis Smoothed Wigner transforms and homogenization of wave propagation
V.	M. Babich Boundary layer approach to construct an interference head wave
V.	V. Borisov The transient waves produced by hyperbolic motion of Gaussian's transverse sources
V.	I. Bronnikov Diffractive model of scattering by a rough surface
J.]	Brüning, V. E. Grikurov Electron scattering by nanotube Y-junction. Computation and application to modeling by graphs
L.	A. Dmitrieva, Yu. A. Kuperin, G. E. RudinMathematical model and design of nanoeloctronic device based on metal-dielectric transition38
Α.	V. Dorofeenko, A. M. Merzlikin, A. P. Vinogradov, A. A. Lisyansky, A. B. Granovsky, M. Inoue, , Enhancement of Faraday effect in open resonators
N.	Ya. Kirpichnikova, S. Yu. Fadeeva, V. B. Fillipov Diffraction of surface waves on the line of velocity discontinuity
Ε.	G. Papkelis, P. V. Frangos , H. T. Anastassiu PO\PTD near-field scattering and diffraction method for path loss prediction in urban mobile radio-systems
Μ.	A. Geyer, T. B. Yanovskaya Numerical approach for analysis of surface wave field in the vicinity of caustics
R.	Mahillo-Isla, M. J. González-Morales , C. Dehesa-Martínez Diffraction of 2D complex beams by a perfect conductor half-plane: a spectral approach
V.	E. Grikurov Windowed oscillatory integral: an approach to compute high-frequency wave fields
Н.	Ishio An attempt to improve semiclassical calculations of wave transport in a quantum wire with diffraction
Α.	I. Ivanov, A. A. Zvyagintsev, D. V. Katkov Whispering gallery eigenmodes of a surface with anisotropic surface impedance
S.	V. Joubert, I. Fedotov, W. Pretorius, M. Shatalov On gyroscopic effects in vibrating and axially rotating solid and annular discs
V.	V. Kucherenko, A. Kryvko Justification of the asymptotic solutions of linear system with a turning point of high order 95

Speaker is given in bold.

V. S. Makin, V. V. Trubaev The comparison of fields excited by input grating coupler with those of surface electromagnetic waves	99
V. S. Makin, R. S. Makin, A. Y. Vorobyev, C. Guo, Universality of Feigenbaum and dissipative microstructures for highly nonequilibrium nonlinear systems	103
G. A. Maximov Biot's equations for multiphase media with temperature gradient on the basis of generalized variational principle.	109
O. V. Motygin On uniqueness in the two- and three-dimensional Neumann-Kelvin problem	112
S. Sautbekov Solving the problems of diffraction by Wiener-Hopf-Fock method for finite fine structures	116
A. V. Shanin, E. D. Shabalina Numerical estimation of acoustic properties in enclosures of simple shape	125
I. A. Shereshevskii, A. V. Lebedev The scattering operator in the stepwise waveguides	131
A. B. Utkin Pulsed radiation produced by a travelling exponentially decaying bipolar current pulse with high-frequency filling	. 137
S. A. Vakulenko Asymptotic solutions of some hyperbolic nonlinear equations	143
F. F. Valiev On similarity between superluminal current pulse shape and time derivative of Whittaker potential	149
Z. A. Yanson On the asymptotics of Rayleigh type waves for singular propagation directions on the surface of anisotropic elastic body	151
N. F. Yashina, T. M. Zaboronkova Electromagnetic surface waves guided by the metal-composite medium boundary	156
V. A. Es'kin, A. V. Kudrin, T. M. Zaboronkova Excitation of whistler modes guided by a lossy anisotropic plasma column	160
Author index	167