

2011 Days on Diffraction

(DD 2011)

St. Petersburg, Russia
30 May – 3 June 2011



IEEE Catalog Number: CFP11489-PRT
ISBN: 978-1-4577-1577-8

CONTENTS

Eron L. Aero, Anatolii N. Bulygin, Yurii V. Pavlov	
Functionally invariant solutions of triple sine-Gordon equation	5
Mikhail V. Altaisky, Natalia E. Kaputkina	
Scale-dependent corrections to Casimir effect	11
Leonardo A. Ambrosio, Hugo E. Hernández-Figueroa	
Emphasizing the metamaterial behavior of the Mie scattering coefficients and Debye series for negative refractive index spherical particles	15
Lutz Angermann, Vasyl V. Yatsyk	
Modeling and analysis of wave scattering and generation on cubically polarisable layered structures	21
Lutz Angermann, Vasyl V. Yatsyk	
Scattering and generation properties of cubically polarisable layers with negative and positive cubic susceptibility of the medium	27
V.M. Babich, N.V. Mokeeva, B.A. Samokish	
Diffraction of a plane wave by a transparent wedge. Calculation of the diffraction coefficients of wave scattered by vertex of the wedge	33
Amira Bensouissi, Noureddine M'Hadbi, Michel Rouleux	
Andreev reflection and the semiclassical Bogoliubov – De Gennes Hamiltonian: resonant states ..	39
V. V. Borzov, E. V. Damaskinsky	
Differential equations for polynomials defined by recurrence relations with periodic coefficients ..	45
Mikhail Cherkay, Sergey Vakulenko	
Control of energy and synchronization of coupled oscillator system	51
Vitalii N. Chukov	
On violation of Rayleigh and Bragg laws of scattering	55
George V. Filippenko	
The energy analysis of shell–fluid interaction	63
A. Frolov, E. Kartchevskiy	
Generalized modes of optical fiber	67
Evgeny A. Gorodnitskiy, Maria V. Perel	
The Poincaré wavelet transform: implementation and interpretation	72
Elena F. Grekova	
Small perturbations of the spherical prestressed state in a nonlinear isotropic elastic reduced Cosserat medium: waves and instabilities	78
Vladimir A. Gusev, Ruslan A. Zhostkov	
Analytical solutions for diffraction problem of nonlinear acoustic wave beam in the stratified atmosphere	83
Timur Z. Ismagilov, Andrey I. Kuzmin	
Modelling photonic crystal waveguides using finite volume method	87
Anton V. Kozlov, Vladimir G. Mozhaev	
Exact solutions for wave resonances in rectangular pyramidal cavity	92
I.P. Krasnov	
About problem of interaction of field and substance in classical electrodynamics	98
Victor F. Kravchenko, Dmitry V. Churikov	
Atomic functions in nonparametric estimations of probability density functions and their derivatives	103
Victor F. Kravchenko, Dmitry V. Churikov	
Two-dimensional analytical Kravchenko–Rvachev wavelets in digital signal and image processing	106

Alexander V. Kudrin, Anna S. Zaitseva, Tatyana M. Zaboronkova, Catherine Krafft	
Electrodynamic characteristics of a strip loop antenna located on the surface of a gyrotropic plasma column	111
A.G. Kyurkchan, N.I. Smirnova	
About one new method of solving diffraction problems	117
Denis Lafarge, Navid Nemati	
Theory of wave propagation and dispersion in fluid-saturated porous media allowing for spatial dispersion	122
Vladimir S. Makin, Ruslan S. Makin	
Diffraction limit overcoming by laser-matter interaction in optics	128
Vladimir S. Makin, Ruslan S. Makin	
Lateral relativistic electron beam synergetic creation and transport by petawatt laser radiation ..	133
Peter G. Malischewsky	
Seismological implications of impedance-like boundary conditions	137
Sergey G. Moiseev, Marina S. Yavtushenko, Anton P. Anzulevich	
Quarter-wave splitter based on heterogeneous composite with prolate silver nanoparticles	141
Maria V. Perel, Mikhail S. Sidorenko	
Effects associated with a saddle point of the dispersion surface of a photonic crystal	145
Maria V. Perel, Dmitry Yu. Zaika	
Asymptotics of surface plasmons on curved interface	149
Alexandr B. Plachenov	
Stability conditions and explicit formulae for basic mode of two classes of rotating two-mirror optical cavities	157
Alexander K. Popov	
Nonlinear electromagnetics in multi-domain negative-index metamaterials	162
Rapoport Yu.G., Grimalsky V.V.	
Nonlinear surface 2D plasmons and giant second harmonic generation	168
Andrey V. Shanin	
Diffraction series on a sphere and conical asymptotics	174
Anatoly P. Sukhorukov, Daria O. Ignatyeva	
Diffraction of wave beams in inhomogeneous metamaterials	180
Andrei B. Utkin	
Causal model of launching an X wave by a superluminal rectilinear current pulse	186
S.N. Vdovichev, A.A. Fraerman, B.A. Gribkov, S.A. Gusev, A.Yu. Klimov, V.V. Rogov	
Phenomena of changing Fraunhofer diffraction pattern of Josephson junction by magnetic field of ferromagnetic dots	193
Nadezhda K. Vdovicheva, Alexandre N. Reznik, Ilya A. Shereshevskii	
Numerical method for the inverse problem of near field microscopy of layered media	195
N.F. Yashina, T.M. Zaboronkova	
Electromagnetic surface waves guided by the boundary between bi-anisotropic composite and dielectric media	201
Michel Zamboni-Rached, Hugo E. Hernández Figueroa	
Non-diffracting beams resistant to attenuation in absorbing media	205
Marina G. Zhuchkova, Daniil P. Kouzov	
Transmission of Rayleigh wave through a surface crack in elastic half-space	212
Author index	215