

2010 XVth International Seminar/Workshop on Direct and Inverse Problems of Electromagnetic and Acoustic Wave Theory

(DIPED 2010)

**Tbilisi, Georgia
27 – 30 September 2010**



**IEEE Catalog Number: CFP10458-PRT
ISBN: 978-1-4244-7790-6**

CONTENTS

Plenary Session

<i>B. Z. Katsenelenbaum</i> , Problems we chose	13
<i>G. Kuchava, G. Sapparishvili, A. Kotchlashvili, N. Sofromadze, M. Prishvin, R. Zaridze</i> , Security system based on signals reflectometer	15
<i>M. Prishvin, L. Bibilashvili, R. Zaridze, Md. R. Islam, M. Ali</i> , Improved numerical simulation and analysis of thermal response during EM exposure with FDTD Lab	20
<i>D. Vashakmadze-Veronese, T. Vashakmadze</i> , To nonlinear dynamical processes for some piezo-electric and electrically conductive continuum media	28

Diffraction and Scattering

<i>K. Yasumoto, V. Jandieri</i> , Scattering from a finite periodic array of magnetized ferrite rods	41
<i>B. Z. Katsenelenbaum</i> , Diffraction on the hole in rotating screen	45
<i>V. Tabatadze, I. Petoev, R. Zaridze</i> , The electromagnetic properties of periodic structures	50
<i>M. I. Andriychuk</i> , Asymptotic solution of EM field wave scattering problem by small bodies: numerical results	54

Propagation in Complex Media

<i>G. D. Aburjania</i> , Interaction of ULF electromagnetic planetary wavy structures with shear flow in the rotating ionosphere	63
<i>F. G. Bogdanov, G. Sh. Kevanishvili, G. V. Kekelia</i> , Simulation and analysis of four- and multi-port waveguide junctions	68
<i>D. Kakulia, F. Shubitidze</i> , Modeling water level's heaving and low-frequency electromagnetic response from the highly conductive object submerging in water environment	72
<i>E. A. Gevorkyan</i> , On the electro-dynamics of counter propagating transverse - magnetic waves in the absorbing plate in a waveguide	77
<i>M. V. Nesterenko, V. A. Katrich, V. M. Dakhov, V. I. Kiyko</i> , Electrodynamic characteristics of the system impedance vibrator - slot radiator in a rectangular waveguide	81
<i>N. A. Sivozalisov</i> , Shielded transmission line with an arbitrary number of conducting strips situated in the same plane	85

Waveguide, Layered, and Cable Structures

<i>A. Demurov, I. Oganezova, A. Yavolovsky, Z. Kuchadze, F. Bogdanov, R. Jobava</i> , Analysis of EMC/EMI problems in printed circuit boards using Green's function approach	91
<i>I. Badzagua, H. Chobanyan, G. Chikovani, I. Oganezova, E. Yavolovskaya, T. Injgia, A. Gheonjian, R. Jobava</i> , Effective computational techniques for EMC analysis of cable harness	96
<i>R. Jobava, A. Gheonjian, D. Karkashadze, G. Chikovani, A. Bzhalava, J. Hippeli</i> , Scattering of low frequency magnetic fields by thin 3D sheets with combined resistive and magnetic properties	103
<i>L. A. Kochetova, S. L. Prosvirnin, V. R. Tuz</i> , Bistable wave transmission through a metal screen with a slit filled nonlinear dielectric	110
<i>G. N. Georgiev, M. N. Georgieva-Grosse</i> , Comparative study of the differential phase shift in some circular waveguides, containing azimuthally magnetized ferrite	114
<i>V. F. Borulko, D. V. Sidorov</i> , Nonlinear resonances in Bragg layered structures with lumped reactive elements	123
<i>L. Angermann, V. V. Yatsyk, M. V. Yatsyk</i> , Generation and resonance scattering of waves on cubically polarisable nonlinear dielectric layer	127

Antennas and Arrays

<i>G. Sh. Kevanishvili, I. G. Kevanishvili, G. D. Tabatadze, G. G. Chikhladze</i> , To the theory of electromagnetic horn antennas	135
<i>F. G. Bogdanov, R. G. Jobava, D. D. Karkashadze, P. Tsereteli, A. L. Gheonjian, E. A. Yavolovskaya, I. Oganezova</i> , Advanced computational techniques to simulate up-to-date automotive antenna EM/EMC problems	139
<i>Sk. R. Hussain, Sk. Kareemulla, D. S. Kumar</i> , Compact CPW- fed antenna with semicircle on two rectangular patches for WLAN application	144
<i>Sk. R. Hussain, M. S. Kumar, D. S. Kumar</i> , Microstrip antenna for dual band/wireless application	150
<i>M. Haridim, B. Levin, M. Bank</i> , Fields compensation by two linear arrays	156
<i>B. Levin, M. Bank, M. Haridim</i> , The compensation method and the antenna pattern	160
<i>V. N. Kochin, L. M. Lytvynenko, S. L. Prosvirnin, G. V. Kekelia</i> , Modeling of a thin dipole antenna loaded at the ends by different diameter metal disks	164
<i>M. I. Andriychuk, V. P. Tkachuk</i> , Comparative synthesis of waveguide array using the variational approach and R-function method	169

Modeling, Analytical and Numerical Methods

L. P. Protsakh, P. O. Savenko, M. D. Tkach, About branching of solutions of synthesis problem for a flat aperture according to the prescribed amplitude directivity pattern 177

O. O. Bulatsyk, Yu. P. Topolyuk, I. V. Tupyachak, Complex vanishing solutions to nonlinear integral equation related to modified phase problem 183

O. O. Bulatsyk, I. V. Tupyachak, N. N. Voitovich, Application of argument principle for determination of number of solutions to nonlinear integral equations related to problems with free phase 187

S. Litynsky, Y. Muzychuk, On weak solution of a boundary value problem for an infinite triangular system of elliptic equations with Robin boundary conditions 192

K. Li, Q. Huang, L. Lin, A meshless method for 3-D wave propagation problems..... 196

O. Kusyy, S. Kuethe, K. Vajen, Simulation-based optimization of a solar water heating system by a hybrid genetic-binary search algorithm 201

A. R. Sydor, Reliability estimation of composite electromagnetic systems 207

V. Teslyuk, P. Denysyuk, H. A. Shawabkeh, A. Kernytsky, Developing the information model of the reachability graph 210

Acoustics

V. G. Kirtskhalia, Speed of sound in medium in the presence of external force field and theory of gravity waves 217

V. V. Matus, Ya. I. Kunets, V. V. Porochovs'kyj, V. O. Mishchenko, SH-wave scattering by elastic inclusion with thin interface inhomogeneity of low rigidity 220

O. Piddubniak, N. Piddubniak, Analysis of acoustical field radiated from two moving trains 223

S. Li, Q. Huang, Efficient block diagonal preconditioner for boundary element method in acoustics 231

Author Index 237