

2018 XXIIIrd International Seminar/Workshop on Direct and Inverse problems of Electromagnetic and Acoustic Wave Theory (DIPED 2018)

**Tbilisi, Georgia
24-27 September 2018**



**IEEE Catalog Number: CFP18458-POD
ISBN: 978-1-5386-6117-8**

**Copyright © 2018 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP18458-POD
ISBN (Print-On-Demand):	978-1-5386-6117-8
ISBN (Online):	978-1-5386-6116-1
ISSN:	2165-3585

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

Table of Contents

Prof. Revaz S. Zaridze's 80 th Year's Anniversary	4
--	---

Plenary Session

<i>F. G. Bogdanov, L. Svanidze, R. Jobava</i> , MoM Solution to Scattering Problem on Multi-Region Composite Structures with Various Type Material Junctions	13
<i>K. Nishimura, M. Kohma, K. Sato, T. Sato</i> , A Beam De-Broadening Algorithm for Atmospheric Radar	19
<i>I. Shamatava, G. Schultz, F. Shubitidze</i> , Accessing UXO Classification Technologies at a Challenging Live-UXO Site	24
<i>I. Petoev, V. Tabatadze, R. Zaridze, S. Invia</i> , Localization of the Scattered Field's Singularities Using the Method of Auxiliary Sources	28

Diffraction and Scattering

<i>T. D. Kaladze, L. V. Tsamalashvili, D. T. Kaladze</i> , Electromagnetic Internal Gravity Waves in an Ideally Conducting Medium	35
<i>M. V. Andreev, V. F. Borulko, O. O. Drobakhin</i> , Analysis of Pulse Signal Reflection in Bragg-Type Layered Structures	39
<i>D. O. Yevtushenko</i> , Optical Diffraction Radiation of a Beam of Particles Flowing Near a Circular Silver Nanowire	43
<i>L. Angermann, V. V. Yatsyk, M. V. Yatsyk</i> , Numerical Specifics in Nonlinear Layer Computation Near Eigen Frequencies of Scattering and Generation	47
<i>S. V. Dukhopelnykov</i> , Control of Backscattering of H-polarized Plane Wave by a Circular Dielectric Rod with Partial Graphene Cover	51
<i>Yu. M. Penkin, V. A. Katrich, M. V. Nesterenko, S. L. Berdnik</i> , Dual-Symmetric Form of Integral Equations for Antenna Currents	55
<i>N. P. Yeliseyeva, V. A. Katrich, M. V. Nesterenko, S. L. Berdnik</i> , Characteristics of Resonant Impedance Dipole Placed Inside Dihedral Corner Reflector	60

Waveguides and Transmission Lines

<i>E. A. Gevorkyan</i> , Transient Radiation of Charged Particle in a Waveguide Completely and Partially Filled with an Anisotropic Magnetodielectric Medium	67
<i>E. I. Veliev, K. Karaçuha, E. Karaçuha</i> , Scattering of a Cylindrical Wave from an Impedance Strip by Using the Method of Fractional Derivatives	72
<i>D. Natarov</i> , Analysis of Eigenmodes of Laser Based on Finite Quantum Nanowire Grating .	76
<i>D. V. Gretskih, A. I. Luchaninov, J. V. Vishniakova, V. A. Katrich, M. V. Nesterenko</i> , Electrodynamic Model of a Wireless Power Transmission System	80

Analytical and Numerical Techniques

<i>I. Lomidze, N. Chachava</i> , The Electromagnetic Field and Radiation Reaction Force for Point Charged Particle with Magnetic Moment	89
<i>B. M. Levin</i> , Integral Equation for Non-Directional Radiators	95
<i>A. J. Samson</i> , Solutions to Fokker-Planck Equations for Non-Gaussian White Noise in FET Undergoing Weak Inversion	99
<i>V. F. Borulko, G. P. Zouros</i> , Modified Prony Method for Integration of Highly Oscillating Functions	103
<i>E. Sever, F. Dikmen, M. E. Hatipoğlu, Y. A. Tuchkin</i> , A Numerically Stable Algorithm for Resonance Frequency Analysis of Circular Cylinders	107
<i>M. E. Hatipoğlu, F. Dikmen, E. Sever, Y. A. Tuchkin</i> , Numerical Stabilization of Recursive T Matrix Method in 2D for TM-z Scattering from Circular Boundaries	111

Inverse Problems and Synthesis

<i>F. Bogdanov</i> , In Memory of Prof. G. Sh. Kevanishvili	117
<i>M. I. Andriychuk, Y. F. Kuleshnyk</i> , Some Generalizations of the Synthesis Problem for Plane Arrays	120
<i>O. Kusyi, N. N. Voitovich</i> , Shape Reconstruction of Body of Revolution at Resonant Frequencies	126
<i>P. Savenko</i> , The Nonuniqueness of Solutions to the Synthesis Problems of Plane Array by the Prescribed Amplitude Directivity Pattern	129

Acoustics and Applications

<i>G. I. Koshovy</i> , Mathematical Models of Acoustic Wave Scattering by a Finite Flat Impedance Strip Grating	137
<i>V. Lysechko, D. Kuryliak</i> , Acoustic Plane Wave Diffraction by an Aperture in a Soft Infinite Screen	141
<i>I. Ya. Zhabdynskyi, V. V. Mykhas'kiv</i> , Acoustic Filtering Properties of 3D Elastic Metamaterials Structured by Crack-Like Inclusions	145
<i>V. Z. Stankevych, I. O. Butrak, V. V. Kovalchuk</i> , Cracks Interaction in the Elastic Composite under Action of the Harmonic Loading Field	149
<i>R. V. Rabosh, Ya. I. Kunets, Yu. I. Maksymiv</i> , Effective Dynamical Parameters of Piezoelectric Medium with Randomly Distributed Piezoelectric Inclusions	153
<i>V. Chekurin, O. Khymko</i> , Waves of Pressure in Gas Pipeline: a Telegraph-Type Model	157
<i>O. M. Stankevych</i> , Wave Displacement Field on an Elastic Bi-Material Surface due to a Mode III Crack Opening	161
<i>M. Melnyk, A. Kernytskyy, J. Rubacha, T. Kamisinski</i> , SketchUP to Catt-Acoustic Converter of Interior Design 3D Models	165
<i>T. Solyar</i> , Investigation of the Crack's Effect on SH-Waves Propagation Based on the Regularized Formula of Inverse Laplace Transform	170

Antennas Design

<i>V. Barbakadze, V. Tabatadze, I. Petoiev, R. Zaridze</i> , Directed Circular Polarized Antenna	177
<i>A. Toktas, E. Yigit, D. Ustun, K. Sabanci, M. Yerlikaya</i> , Reconfigurable Band-Notched Compact C-shaped Printed Antenna for UWB Applications	181
<i>D. Ustun, A. Toktas, K. Sabanci, E. Yigit, F. Toktas</i> , An UWB Antenna Design Having Band-Reject Characteristic by Y-Shaped Strip	185
<i>F. T. Çelik, K. Karaçuha</i> , Dual-Band Microtrip Quasi-Yagi Antenna Design for Free Band and 5G Mobile Communication	189
<i>S. V. Bukharov, L. A. Filins'kyy, O. O. Lysychnyy, P. V. Krasnoshlyk</i> , Modeling of the Hybrid Dielectric Rod Surface Mount Antenna	193

Medical and Geophysical Applications

<i>T. Nozadze, V. Jeladze, V. Tabatadze, I. Petoev, R. Zaridze, Mobile Phone Antenna's EM Exposure Study on a Homogeneous Human Model Inside the Car</i>	199
<i>T. Shubitidze, B. E. Barrowes, E. Chapman, M. Prishvin, K. O'Neill, F. Shubitidze, The Crank-Nicolson FDTD Method in Cylindrical Coordinates and Its Application to Underwater UXO Detection and Classification Problems</i>	204
<i>A. Lomia, L. Shoshiashvili, D. Kakulia, B. Baratashvili, G. Chaganava, G. Ghvedashvili, F. Shubitidze, Heat Production During mNP Hyperthermia – Applied on a Deep Seated Tumors</i>	208
<i>L. Gheonjian, T. Paatashvili, M. Oragvelidze, P. Tsotskolauri, Tbilisi State University Extremely Low Frequency Radiation Research Net (ELFTSU Net): the Concept and Structure of ELF Observation Station</i>	213
<i>L. Gheonjian, T. Paatashvili, M. Oragvelidze, P. Tsotskolauri, Tbilisi State University Extremely Low Frequency Radiation Research Net (ELFTSU Net): Earthquake Triggering and Synchronization Concept for the Net Operation</i>	217
<i>E.Yiğit, K. Sabanci, A.Toktaş, D.Ustun, H.Duysak, Grain Moisture Detection by Using A-Scan Radar Measurement</i>	222

Modeling in Electronics

<i>D. Eremyan, A. Gheonjian, D. Imnadze, Z. Kut Chadze, M. Oragvelidze, R. Jobava, H. Ben Htira, Modeling and Validation of the Basic EMC Filter at Different Simulation Levels</i>	227
<i>T. Gavasheli, Z. Shermadini, G. Ghvedashvili, S. Suladze, G. Mamniashvili, T. Gegechkori, L. Rukhadze, Magnetometry and NMR Study of Carbon Nanopowders Doped with Cobalt Nanoclusters and Self-Assembly of their Polymer Nanocomposites under Magnetic Field</i>	233
<i>A. Toktas, D. Ustun, E. Yigit, K. Sabanci, M. Tekbas, Optimally Synthesizing Multilayer Radar Absorbing Material (RAM) Using Artificial Bee Colony Algorithm</i>	237
<i>D. Ustun, E. Yigit, A. Toktas, K. Sabanci, H. Duysak, GPR Image Focusing Using Matched Filter Algorithm</i>	242
<i>K. Sabanci, E. Yigit, D. Ustun, A. Toktas, M. F. Aslan, WiFi Based Indoor Localization: Application and Comparison of Machine Learning Algorithms</i>	246

Invited Paper

<i>M. S. Gupta, Physical Channel Models for Emerging Wireless Communication Systems</i>	255
--	-----

<i>Index of Authors</i>	261
--------------------------------	-----