



IEEE



**XXIXth International Seminar/Workshop on
DIRECT AND INVERSE PROBLEMS OF ELECTROMAGNETIC AND ACOUSTIC WAVE
THEORY**

September 11-13, 2024

DIPED-2024

Tbilisi, Georgia

TECHNICAL PROGRAM

Wednesday, September 11th

9³⁰-10⁰⁰: *Registration and Checking Zoom Connection*

10⁰⁰-10³⁰: *Opening and Welcome*

10³⁰-12³⁰: *Plenary Session*

- Study of the Processes of Magnetization Reversal and Pinning of Domain Walls in Cobalt Nanowires Polarized in an Epoxy Matrix *Tsisana Gavasheli, Tatiana Gegechkori, Grigor Mamniashvili, Giorgi Ghvedashvili, Tinatin Zedginidze, Tamar Petriashvili, Tbilisi, Georgia* **10.30 – 11.00**
- Monomode Waveguide Resonators for Microwave and Optical Applications *Vadym Pazynin, Kharkiv, Ukraine, Wilhelm Keusgen, Berlin, Germany* **11.00 – 11.30**
- Analytical Prediction of Magnetic Field Shielding for Multilayer Thin Sheets Excited by Loop Sources *Giorgi Korkotadze, Giorgi Chiqovani, Roman Jobava, Tbilisi, Georgia* **11.30 – 12.00**
- On the Modeling of Acoustic Fields in a Half Space with Acoustically Hard Inclusion *Andrii Hlova, Svyatoslav Litynsky, Yuriy Muzychuk, Anatoliy Muzychuk, Lviv, Ukraine* **12.00 – 12.30**

12³⁰-13³⁰: *Lunch*

13³⁰-14⁵⁰: *EM Field Theory*

- Some Expressions for a Circular Cylinder Wave Fields *Ivane Darsavelidze, Tbilisi, Georgia* **13.30 – 13.50**
- Some Expressions for Zonal Spherical Wave Fields. Linear Multipole *Ivane Darsavelidze, Tbilisi, Georgia* **13.50 – 14.10**
- Some Expressions for Sectoral and Tesseral Spherical Wave Fields *Ivane Darsavelidze, Tbilisi, Georgia* **14.10 – 14.30**
- Spectral Boundary Integral Equation Methods for Electromagnetic Research with Different Geometrical Configurations *Ludmila Illyashenko, Kharkiv, Ukraine* **14.30 – 14.50**

14⁵⁰-15¹⁰: Coffee Break

15¹⁰-16³⁰: Numerical Techniques

- On the Problem of Robustness and Resolution of Estimates for the Fractional-Rational Approximation Method *Oleg Drobakhin, Maksim Potapov, Dnipro, Ukraine* **15.10 – 15.30**
- Improved Algorithm for Approximate Solution of Integral Equations of Diffraction Problems on Periodic Structures *Volodymyr Dushkin, Kharkiv, Ukraine* **15.30 – 15.50**
- Analytical Solution of Linear Antenna Synthesis Problems According to Given Amplitude Directivity Pattern at the Least Squares Deviation for the Phase of Solution *Yuriy Topolyuk, Lviv, Ukraine* **15.50 – 16.10**
- Solving Linear Inverse Problems via Criterion of Minimum Extent *Serhii Vovk, Valentyn Borulko, Dnipro, Ukraine* **16.10 – 16.30**

Thursday, September 12th

9⁰⁰-11⁰⁰: Complex Media and Structures

- Measuring the Line Density of Plasma Electrons by Three-Probe Microwave Interferometry *Aleksei Doronin, Nikolai Gorev, Inna Kodzheshpirova, Kharkiv, Ukraine* **9.00 – 9.20**
- Optimization Approach to Modification of Characteristics of Bragg Structure Based on Parametric Weighting *M. V. Andreev, O. O. Drobakhin, Dnipro, Ukraine* **9.20 – 9.40**
- Investigation of Plasmon Resonances in Silver Concentric Nanoshell (“Nanomatryushka”) *Nadiia P. Stognii, Volodymyr O. Doroshenko, Olha V. Zhyla, Kharkiv, Ukraine* **9.40 – 10.00**
- Reflective Properties of a Thin Wire Substrate-Like Metagrating *Oleg Rybin, Sergey Shulga, Trohym Baula, Kharkiv, Ukraine, Muhammad Raza, Sahiwal, Pakistan* **10.00 – 10.20**
- Mathematical Modeling of Wave Diffraction on a Conical Grating with Semitransparent Strips *Volodymyr O. Doroshenko, Nadiia P. Stognii, Olha V. Zhyla, Kharkiv, Ukraine* **10.20 – 10.40**
- Altering Magnetic Permeability of a Material Supplemented with Chaotically Embedded Particles *Borys Yevstyhneiev, Lviv, Ukraine* **10.00 – 11.00**

11⁰⁰-11³⁰: Coffee Break

11³⁰-13⁵⁰: Antennas, Inverse Problems and Synthesis

- Radiation Fields of Open Ring Microstrip Antenna *Mikhail Nesterenko, Sergey Pogarsky, Victor Katrich, Svetlana Pshenichnaya, Kharkiv, Ukraine* **11.30 – 11.50**

DIPED-2024 International Seminar/Workshop Technical Program

- Microstrip Antenna with Quasi-Fractal Substructure *Sergey A. Pogarsky, Dmitry V. Mayboroda, Sergey N. Mykhaliuk*, Kharkiv, Ukraine **11.50 - 12.10**
- Influence of Aperture Angle of Finite Size Corner Antenna on its Directional and Band Properties *Nadezhda Yeliseyeva, Nikolay Gorobets, Serhii Berdnyk, Oleksii Horobets*, Kharkiv, Ukraine **12.10 – 12.30**
- Tilted Cone-Enhanced Ultrawideband Monopole- Slot Radiators in Antenna Arrays *Oleksandr Dumin, Vadym Plakhtii, Oleksandra Skvortsova, Viktor Katrich*, Kharkiv, Ukraine **12.30 – 12.50**
- Combined Dipole-Slot Radiating Structures with Parasitic Impedance Dipoles as Functional Elements of Antennas and Antenna Arrays *Serhii Berdnyk, Victor Katrich, Yevhenii Antonenko, Svetlana Pshenichnaya, Volodymyr Katrych, Kostiantyn Garmash, Dmytro Havrylenko*, Kharkiv, Ukraine **12.50 – 13.10**
- On the Synthesis of a Matching-Reflecting Multilayer Dielectric Structure *Oleg Drobakhin, Maksim Potapov*, Dnipro, Ukraine **13.10 – 13.30**
- Determination of the Location of the Radiation Source *Tetiana Ogurtsova, Gennadiy Pochanin, Mykhail Nesterenko, Iryna Pochanina, Vadym Ruban*, Kharkiv, Ukraine **13.30 – 13.50**
- On the Integral Equations for the Current in the Antenna *Boris Levin*, Lod, Israel **13.50 – 14.10**
- Reactive Impedance of Linear Radiator *Boris Levin*, Lod, Israel **14.10 – 14.30**

14³⁰-15³⁰: Lunch

15³⁰-17³⁰: Microwave Devices and Signal Processing

- Synthesis of TL Resonators with $3\lambda/4$ -Mode Oscillations for Bandpass Filters with Multiple Transmission Zeros *Sergii Litvintsev, Alexander Zakharov*, Kyiv, Ukraine **15.30 – 15.50**
- Design of Bandpass Filters with High Mode $5\lambda/4$ Oscillations and Equidistant Transmission Zeros Pairs *Sergii Litvintsev, Alexander Zakharov*, Kyiv, Ukraine **15.50 – 16.10**
- Exponential and Rational Models for Radar Signals *Valentyn Borulko, Victor Gritsenko*, Dnipro, Ukraine **16.10 – 16.30**
- Analytical Modeling and Analysis of Airy Pulse Interaction with a Dynamic Boundary *Olha Zhyla, Nadiia Stognii, Volodymyr Doroshenko*, Kharkiv, Ukraine **16.30 – 16.50**
- Optimization of Single-Channel Moving Target Indication Filters Using Pulse Repetition Interval Staggered *Volodymyr Orlov, Hennadii Bratchenko, Serhii Zharykov, Oleksandr Yastrubenko*, Odesa, Ukraine **16.50 – 17.10**
- Determining the Zone of Successful Interaction in RFID Technologies *Larysa Kriuchkova, Volodymyr Sokolov, Pavlo Skladannyi*, Kyiv, Ukraine **17.10 – 17.30**

17³⁰-18⁰⁰: Coffee Break

18⁰⁰-20⁰⁰: EM Wave Radiation and Scattering

- Assessment of the EM Radiation Level in Tbilisi School Locations Tamar Nozadze, Davit Kharshiladze, Vera Jeladze, Giorgi Ghvedashvili, Revaz Zaridze, Tbilisi, Georgia **18.00 – 18.20**
- Assessment of Electromagnetic Field Exposure to Humans at 2.4 GHz Wi-Fi Frequency Tamar Nozadze, Vera Jeladze, Tbilisi, Georgia, Jens Haueisen, Ilmenau, Germany **18.20 – 18.40**
- Improved Cylindrical Antenna Model for Assessment of Influence of the EM field on a Human Body Taras Nazarovets, Lviv, Ukraine **18.40 – 19.00**
- On the Theory of Resonant Interaction of Electromagnetic Waves with Periodically Modulated Dielectric Filling of a Waveguide Eduard Gevorkyan, Moscow, Russia **19.00 – 19.20**
- Mathematical Models of EM Wave Scattering from Electrically Narrow Strip and Coplanar Strip' Systems George I. Koshovy, Kharkiv, Ukraine **19.20 – 19.40**
- Electromechanical Properties of the Toroidal Solenoid Bohdan Karkulovskyy, Lviv, Ukraine **19.40 – 20.00**

Friday, September 13th

9⁰⁰-11⁰⁰: Characterization of Complex Structures

- Electrodynamics Characteristics of Biconical Dipole with Complex Distributed Surface Impedance and Asymmetric Excitation Mikhail Nesterenko, Victor Katrich, Oleksandr Dumin, Yuriy Arkusha, Kharkiv, Ukraine **9.00 – 9.20**
- Comparison of Radiation Characteristics of a Dipole with a Square Screen depending on their Distance Nadezhda Yeliseyeva, Nikolay Gorobets, Oleksii Horobets, Serhii Berdnyk, Kharkiv, Ukraine **9.20 – 9.40**
- Solution of 3D Electromagnetic Diffraction Problem by PEC Circular Double Disks Using the Method of Auxiliary Sources Emre Iscan, Vasil Tabatadze, Istanbul, Turkey **9.40 – 10.00**
- Polarization and Frequency Selective Characteristics of a Chiral Metasurface Consisting of Periodically Arranged Square Dielectric Helices P. L. Mladyonov, V. V. Yachin, T. L. Zinenko, L. A. Kochetova, S. V. Mizrakhy, Kharkiv, Ukraine **10.00 – 10.20**
- The Solution of the Direct Problem on the Propagation of Millimeter Waves in Liquid Foam Structures Leonid Filins'kyy, Dnipro, Ukraine **10.20 – 10.40**
- Modeling and Analysis of Metalens Characteristics: Simulation Results Vadym Slyusar, Kyiv, Ukraine, Ihor Sliusar, Poltava, Ukraine, Sergey Sheleg, Scottsdale, USA **10.40 – 11.00**

11⁰⁰-11³⁰: Coffee Break

11³⁰-14¹⁰: Acoustics and Applications

- Variance of Desired Speaker Estimation Based Speech Enhancement *Trong The Quan*, Hanoi, Vietnam **11.30 – 11.50**
- A Perspective Spectral Mask for GSC beamformer in Annoying Environment *Trong The Quan*, Hanoi, Vietnam **11.50 – 12.10**
- Expectation Maximum Algorithm - Based Enhanced Speech Enhancement by Using Microphone Array *Trong The Quan, Anh Pham Tuan*, Hanoi, Vietnam **12.10 – 12.30**
- Mathematical Model for Attenuated Infrasound Wave Propagation *Mykhaylo Melnyk, Yulian Salo*, Lviv, Ukraine, *Anna Timofiejczuk, Wojciech Sitek*, Gliwice, Poland, *Ivan Popovych, Roman Vynarovych*, Lviv, Ukraine **12.30 – 12.50**
- A Mathematical Model Creation for Vibration Propagation in a Plate Based on the Concept of a Longitudinally Moving One-Dimensional Body *Dariia Rebot, Serhiy Shcherbovskykh, Tetyana Stefanovych, Olena Stankevych, Volodymyr Topilnytskyi*, Lviv, Ukraine **12.50 – 13.10**
- Dynamic Strength of an Elastic Matrix with a Partially Healed Crack *V. Z. Stankevych, I. Ya. Zhabdynskyi, M. O. Babyak*, Lviv, Ukraine **13.10 – 13.30**
- Remote Determination of Physical and Mechanical Parameters of Thin Flat Non-Contrast Piezoelectric Inclusions *R. M. Andriychuk, V. V. Matus, V. V. Porochovs'kyj*, Lviv, Ukraine **13.30 – 13.50**
- Analysis of Dynamic Displacements in a Bimaterial with a Torsion Crack *Olena Stankevych, Volodymyr Stankevych*, Lviv, Ukraine **13.50 – 14.10**

14¹⁰-14³⁰: Coffee Break

14³⁰-15⁰⁰: Closing Session