NSTU NETI · SKIF Siberian Circular Photon Source · IEEE · Electron Devices Society · EMB IEEE Engineering in Medicine and Biology Society · pels IEEE Power Electronics Society · ies The IEEE Industrial Electronics Society · IEEE young professionals

EDM

24th International Conference of Young Professionals in Electron Devices and Materials (EDM)

29.06
03.07
2023

CONFERENCE PROGRAM

Content

 - online report

*time of the report on the website:
https://edm.ieeesiberia.org/schedule/

Plenary Session

June 30, 9:30-12:30, Hall B

1. **Conference Opening Ceremony – 9:30**

   Sergey Kharitonov
   Conference Chair
   Head of the Power Electronics Institute, NSTU

   Artur Otto
   Vice-Rector for Research, NSTU

2. **Synchrotron Radiation is a Tool for Interdisciplinary Research– 10:00**

   Konstantin Zolotarev
   Budker Institute of Nuclear Physics

3. **New Realities of Measurements and Tests – 10:30**

   Bronislav Chislov
   LLC "Scientific devices and systems"

4. **Prospects for the Development and Use of Digital Twins in Transport Electrical Equipment – 10:40**

   Sergey Khalyutin
   Moscow State Technical University of Civil Aviation (MSTU CA)

5. **OOO NPF "Energiya" – 11:10**

   Vladimir Fomichev
   OOO NPF "Energiya"

6. **Heterostructures Based on III-Nitrides for Microwave and Power Transistors – 11:20**

   Denis Milakhin
   Rzhanov Institute of Semiconductor Physics of the Siberian Branch of Russian Academy of Sciences

Section: Semiconductor Physics and Technology

July 1, 9:30-19:00, Hall A

Section Chair: Nataliya L. Shwartz, Denis S. Milakhin, Dmitriy I. Ostertak

INVITED REPORT:

Theory and modeling of MHD processes in metallurgy

Vladimir Aliev

Rzhanov Institute of Semiconductor Physics SB RAS

1. **Temperature Influence on the Si(111) Surface Relief Evolution during Au Deposition**

Snezhana Mantsurova

Novosibirsk State Technical University

2. **Using Genetic Algorithm and Simulated Annealing with Memory to Solve Layout Synthesis Problem for GaAs MMIC**

Dmitry Bilevich

Tomsk State University of Control Systems and Radioelectronics

3. **Analyzing the Capacitance Coupling of Electrodes with a Solder Layer on the Transistor Footprint**

Anastasiya Drozdova

Tomsk State University of Control Systems and Radioelectronics

4. **Synaptic VO2 Resistor on Glass Substrate for Neuromorphic Circuits**

Dmitry Kalmykov

Novosibirsk State Technical University

5. **Methodology for Calculation of Elastic Constants of Diamane by Molecular Dynamics**

Polina Polyakova

Ufa State Petroleum Technological University

6. **Graphene Network with Ni and Al Nanoparticles as the Composite Precursor: Atomistic Simulation**

Liliya Safina

Institute for Metals Superplasticity Problems of the Russian Academy of Science

7. **Influence on the Parameters of GaAs-based HG PCSS Switching in Lock-On Mode at Laser Radiation With a Wavelength of 355 nm and 1064 nm**

Valerii Barmin

Institute of High Current Electronics of the Siberian Branch of the Russian Academy of Sciences

8. **The Impact of Electromagnetic Interference Generated by Electrostatic Discharge on Microcontroller Performance under Temperature Exposure in a TEM Cell**

Valeriy Semenyuk

Tomsk State University of Control Systems and Radioelectronics

9. **Native Oxide of HgCdTe as a Passivation Layer**

Irina Krasnova

Rzhanov Institute of Semiconductor Physics of the Siberian Branch of the Russian Academy of Sciences

10. **Thermal ALD Synthesis of Vanadium Oxide Thin Films and Its Structural and Electrical Characterization**

Bogdan Voloshin

Rzhanov Institute of Semiconductor Physics of the Siberian Branch of the Russian Academy of Sciences

11. **Method for Estimating the Frequency Dependence of the Materials Permittivity with a Crystal Structure on SHF Band**

George Malyutin

Tomsk State University of Control Systems and Radioelectronics

12. **Nanostructure Formation from Polycrystalline Vanadium Dioxide Films Using an Atomic Force Microscope**

Nikita Mantsurov

Novosibirsk State Technical University

13. **Numerical Study of the Influence of the Microtrenches on Optical Properties of Integrated Optical Waveguides on Lithium Niobate on Insulator**

Dmitrii Moskalev

Perm State University

14. **Chemical Kinetics of the Nitridation Process of Silicon Si(111) Substrates at Different Ammonia Fluxes**

Dmitriy Bashkatov

Rzhanov Institute of Semiconductor Physics of the Siberian Branch of the Russian Academy of Sciences

15. **Composite Polymer Material Based on Hexaferrite with Selective Absorption in the EHF Range for 3D-printing Technology**

Ivan Vertoprakhov

National Research Tomsk State University

16. **Numerical Simulation of Vanadium Dioxide Based Two-Terminal Nanoswitches.**

Evgenii Bagochus

Rzhanov Institute of Semiconductor Physics of the Siberian Branch of the Russian Academy of Sciences

17. **Multiresonant Chiral Metamaterial Based on Single-Turn Wavy Ribbon Metal Helices**

Alexey Gayduk

Rzhanov Institute of Semiconductor Physics of the Siberian Branch of the Russian Academy of Sciences

18. **Tuning of Nanostructures Growth after Laser Ablation of Zn in Water**

Victoria Pryakhina

Ural Federal University named after the First President of Russia B. N. Yeltsin

19. **Microelectromechanical Converter Performance under Random Multiple-Frequency Vibrations**

Ekaterina Kovalenko

Novosibirsk State Technical University

20. **Size Distribution of Straight Step Region on the Si(100) Surface**

Michael Yesin

Rzhanov Institute of Semiconductor Physics of the Siberian Branch of the Russian Academy of Sciences

21. **In Based TCB Bonding for MEMS Application**

Vasiliy Koshelev

National Research University of Electronic Technology

22. **Growth of the BaF2/CaF2/Al2O3 structures for the radiation-resistant photo-receiving devices of Infrared range**

Igor Rudenko

Novosibirsk State Technical University

23. **The Structural and Electrical Properties of High-k Hf-Sm-O Thin Films Prepared by Atomic Layer Deposition**

Darya Petukhova

Nikolaev Institute of Inorganic Chemistry of the Siberian Branch of the Russian Academy of Science

24. **Simulation of GaN Nanocluster Droplet Epitaxy on Si(111) Substrate**

Maria Litvinenko

Novosibirsk State Technical University

25. **Hall Effect in Strong Electric Fields in AlGaAs/InGaAs/GaAs Heterostructures with Donor-Acceptor Doping**

Vadim Kuznetsov

Novosibirsk State Technical University

26. **Advanced Logic Gates for FPGAs**

Ivan Vasenin

Perm National Research Polytechnic University

27. **Investigation of Stripline Modules at the Formation of Quasi-Chaotic Signals in the Transmittig-Receiving Path**

Artush Arutyunyan

Tomsk State University of Control Systems and Radioelectronics

28. **Optical Properties of Two-Dimensional Islands of Tungsten Disulfide (WS2)**

Anna Krivonogova

Novosibirsk State Technical University

29. **Investigation of the Effect of Stretching on the Properties of Ge2Sb2Te5 Thin Films**

Andrei Stupin

National Research University of Electronic Technology

30. **Investigation of the Thermoelectric and Electrophysical Characteristics of Bi2Te3 Thin Films**

Andrei Stupin
National Research University of Electronic Technology

31. **Bipolar Gunn Effect and Subnanosecond Switching of the High-Voltage GaAs Diodes Initiated by Microsecond Kilovolt Voltage Ramp**

Mikhail Ivanov
Ioffe Physical-Technical Institute of the Russian Academy of Sciences

Section: Radio Engineering Systems and Telecommunications

June 30, 13:30-19:30, Hall B

July 1, 9:00-11:00, Hall B

Section Chair: Svetlana V. Vorobiova, Maksim A. Stepanov

FIRST DAY.

1. **The Novel Waveguide-Fed Log-Periodic Dipole Antenna with Multiple Notched Bands**

   Kristina Tsikolenko

   Novosibirsk State Technical University

2. **Synthesis of the Calibration Algorithm of the Microwave Signal Power Meter**

   Denis Chernysh

   Novosibirsk State Technical University

3. **Formation of the Electric Field Strength Maximum at a Given Point in Space by a Focused Linear Antenna Array**

   Denis Iuzvik

   Novosibirsk State Technical University

4. **Fast Bit-Flipping Decoding of Polar Codes with Additional Nodes**

   Ilya Timokhin

   Higher School of Economics

5. **Near Field – Far Field Transformation with Pre-Correction Probe Technique**

   Alexandr Slobodyanenko

   Novosibirsk State Technical University

6. **Propagation of Interferences in Asymmetric Strip Structures with Modal Decomposition**

Salim Karri

Tomsk State University of Control Systems and Radioelectronics

7. **Influence Analysis of Mismatch on Nonlinearity in Hybrid RC-DACs**

Natalya Kvashina

Peter the Great St. Petersburg Polytechnic University

8. **Reflections in a Meander Line Turn of Two Segments as a Resource for Suppressing UWB Excitations**

Pavel Mikola

Tomsk State University of Control Systems and Radioelectronics

9. **Determination of Location in the Wi-Fi Network Using the Taxometric Method of Decision-making**

Ilya Doshchinsky

Siberian State University of Telecommunications and Information Sciences

10. **Applying Decision Forest for Improving the Adaptation of the ML Algorithm for Beamsteering to Traffic Dynamics in V2I Systems**

Ekaterina Lopukhova

Ufa State Aviation Technical University, Ufa University of Science and Technology

11. **Printed Dual-Band Dipole Antenna**

Vadim Sokolov

Novosibirsk State Technical University

12. **Trajectory Filtering Algorithm in Multi-Position Passive Radars with Additional Flight Altitude Observation**

Alexander Chugunov

National Research University "Moscow Power Engineering Institute"

13. **Multicriteria Optimization of Modal Filters Using Evolutionary Algorithms and Random Search Method**

Viktoriya Gordeyeva

Tomsk State University of Control Systems and Radioelectronics

14. **4-bit X-band Variable Gain Amplifier with Additional Steering Transistors Based on 90 nm CMOS**

Dias Khojikov

Tomsk State University of Control Systems and Radioelectronics

15. **Tunable Impedance Transformer based on J-Invertors**

Irina Filipyuk

Saint Petersburg Electrotechnical University “LETI”

16. **Prototype of a Pulse-Frequency Modem for Transmitting Information over Power Supply Networks**

Vasiliy Egorov

Moscow Aviation Institute (National Research University)

17. **Ultrasound Assistant Device for the Blind**

Viktor Smirnov

Novosibirsk State Technical University

18. **The Experimental Research of DOA Estimation Based on Difference Co-array Method**

Andrey Kazarinov

Saint Petersburg Electrotechnical University “LETI”

19. **Application of Compensation Method for Layout Parasitic Elements Control in Precision DACs**

Dmitry Koloskov

Novosibirsk State Technical University

20. **Staggered SAR Range Ambiguity Suppression with Quasi-Orthogonal Signals**

Sergey Kislyy

National Research University of Electronic Technology

21. **Software Module for Determining Parameters of a Bipolar Transistor SPICE-Model Using Static Volt-Ampere Characteristics**

Timur Tretiakov

Tomsk State University of Control Systems and Radioelectronics

22. **Influence of Failures in Flexible Printed Cables with Single Modal Reservation on the Attenuation of an Ultra-Short Pulse**

Maria Samoylichenko

Tomsk State University of Control Systems and Radioelectronics

23. **Novel MoM-based Approaches for Generating Wire-grid Sparse Antenna Structures**

Manh Tuan Nguyen

Tomsk State University of Control Systems and Radioelectronics

24. **5G NR UE Structure between PHY and RU for Real-Time Operation**

Andrey Veyler

Siberian State University of Telecommunications and Information Sciences

25. **Design and Examination of an Automatic Control System of Time Scale Generation**

Svyatoslav Burtsev

The Federal State Unitary Enterprise «Russian metrological institute of technical physics and radioengineering»

SECOND DAY.

1. **Algorithm for Solving the Navigation Problem for Ultra-Wideband Local Navigation System based on the Extended Kalman Filter for Time of Arrival Architecture**

Nikita Petukhov

National Research University "Moscow Power Engineering Institute"

2. **Resonators in Modal Filter as a Resorse for Improving its Characteristics**

Yuri Kalashnikov

Tomsk State University of Control Systems and Radioelectronics

3. **Influence of Temperature on the Frequency Characteristics of a Modal Filter Based on a Microstrip Line with Two Side Grounded Conductors**

Bakhtiyar Nurkhan

Tomsk State University of Control Systems and Radioelectronics

4. **Representation of ICI as AWGN in PD-NOMA System Model**

Andrey Brovkin

Tomsk State University of Control Systems and Radioelectronics

5. **Improving Performance of GNSS Pseudorange Residual Error Mitigation Model**

Vladislav Zhilinskiy

The Federal State Unitary Enterprise «Russian metrological institute of technical physics and radioengineering»

6. **Investigation the UWB Local Navigation System Relative Positioning Error for UAV**

Nikita Rukovishnikov

National Research University "Moscow Power Engineering Institute"

7. **Method for Assessing the Interference Immunity of Non-Specialised Consumer Navigation Equipment**

Artyom Maltsev

The Federal State Unitary Enterprise «Russian metrological institute of technical physics and radioengineering»

Section: New Approaches to Synchrotron Radiation Sources

June 30, 13:30-16:00, Hall D

Section Chair: Konstantin V. Zolotarev, Alexander B. Berkin

1. **Investigation of Harmonic Generation in a High-Current Relativistic Gyrotron**

Alexander Leontyev

Federal Research Center A.V. Gaponov-Grekhov Institute of Applied Physics of the Russian Academy of Sciences

2. **Block of a Master Oscillator for the High-Frequency System of «Sibir-2» Accelerator-Storage Complex from Kurchatov Institute**

Maxim Kornievskiy

Novosibirsk State Technical University

3. **Influence of Clean Conditions on the Current-Voltage and Switching Characteristics of the Glow Discharge**

Gleb Shevchenko

Rzhanov Institute of Semiconductor Physics of the Siberian Branch of the Russian Academy of Sciences

4. **Microwave Frequency Comb Generation During Interaction of Monochromatic Wave with Electron Beam Acting as Reactive Nonlinear Medium**

Lev Yurovskiy

Federal Research Center A.V. Gaponov-Grekhov Institute of Applied Physics of the Russian Academy of Sciences

5. **Compression of the W-band Superradiant Pulse in the Process of Self-Induced Transperency Soliton Formation**

Lev Yurovskiy

Federal Research Center A.V. Gaponov-Grekhov Institute of Applied Physics of the Russian Academy of Sciences

6. **Quasioptical Model of Terahertz Undulator Superradiance from Picosecond Electron Bunches**

Michael Vilkov

Federal Research Center A.V. Gaponov-Grekhov Institute of Applied Physics of the Russian Academy of Sciences

7. **Development of One-Coordinate Detector for Diffraction Experiments at a Synchrotron Radiation Beam**

Anastasiia Glushak

Budker Institute of Nuclear Physics of the Siberian Branch of the Russian Academy of Sciences

8. **Synchronization Device of the Specialized Source of Synchrotron Radiation «Sibir-2» of the Kurchatov Institute**

Timofey Abramets

Budker Institute of Nuclear Physics of the Siberian Branch of the Russian Academy of Sciences

9. **Coaxial Load for Absorbing High-Power Voltage Pulses Modulated by Microwave Oscillations**

Vladimir Konev

Institute of High Current Electronics of the Siberian Branch of the Russian Academy of Sciences

10. **High Power Nanosecond RF Pulse Generation in Nonlinear Transmission Lines with Spatial Dispersion**

Pavel Priputnev

Institute of High Current Electronics of the Siberian Branch of the Russian Academy of Sciences

11. **Method of the Cable Communication Calibration for Electroacoustics Measuring the Parameters of Hydroacoustics Transducers**

Roman Travin

Federal Research Center A.V. Gaponov-Grekhov Institute of Applied Physics of the Russian Academy of Sciences

Section: Cryogenic Electronics

June 30, 16:30-19:30, Hall D

Section Chair: Alexey G. Vostretsov

1. **Investigation of the Magnetic Properties of Ferromagnets at Cryogenic Temperatures**

   Pavel Troshin

   Moscow Aviation Institute (National Research University)

2. **Evaluation of the Self-Heating Effect in the Static Characterization of Cryo-Cooled Power Diodes**

   Mikhail Ostapchuk

   Moscow Aviation Institute (National Research University)

3. **Cryogenically-Cooled Stabilized Power Factor Correction Rectifier for Future Aircraft Electrical Systems**

   Aleksey Alekseev

   Moscow Aviation Institute (National Research University)

4. **Investigation of the Accuracy of Modelling the Current-Voltage Characteristics of DC Superconducting Quantum Interference Device**

   Svetlana Filatova

   Novosibirsk State Technical University

5. **Features of the Cryogenic Temperature Controller Development**

   Alexander Samarin

   Prokhorov General Physics Institute of the Russian Academy of Sciences

6. **Cryogenic Low-Noise Amplifier 1-3GHz**

Dmitry Volkhin

Novosibirsk State Technical University

7. **Expanding Scanning Frequency Range of Josephson Parametric Amplifier Axion Haloscope Readout with Schottky Diode Bias Circuit**

Boris Ivanov

Center for Axion and Precision Physics Research of Institute for Basic Science

Section: Optoelectronic Devices and Systems: Physics, Electronics, Application

June 30, 14:30-19:00, Hall A

Section Chair: Eugene V. Sypin, Maxim V. Trigub

1. **Power Supply Voltage Ripple Effect on the Imaging in Laser Monitor**

   Konstantin Semenov

   Zuev Institute of Atmospheric Optics of the Siberian Branch of the Russian Academy of Science

2. **Semiconductor Excitation Power Supply for the Metal Halide Vapor Laser**

   Pavel Gembukh

   Zuev Institute of Atmospheric Optics of the Siberian Branch of the Russian Academy of Science

3. **Downconversion Circuit in Photonic Integrated Sensing System Based on an Optoelectronic Oscillator**

   Vladislav Ivanov

   Ufa University of Science and Technology

4. **Optimizing the Structural Parameters of the Mechanical Sensing Element of a Microoptoelectromechanical Micro-g Accelerometer**

   Ayan Myrzakhmetov

   Tomsk State University of Control Systems and Radioelectronics

5. **Numerical Simulation of Grating Input/Output Elements into Optical Waveguides Based on Si3N4/SiO2 Thin Films**

Ayan Myrzakhmetov

Tomsk State University of Control Systems and Radioelectronics

6. **Stoichiometry Optimization in InGaN Epitaxy Towards Stimulated Emission in Near Infrared with Minimum Threshold**

Mikhail Kalinnikov

The Institute for Physics of Microstructures of the Russian Academy of Sciences

7. **Influence of the Design of UV Radiation Detectors on Photoelectrical Characteristics**

Alexander Tsymbalov

National Research Tomsk State University

8. **Optimization of Noise Floor Level in an Optical Frequency Domain Reflectometer Based on a Self-Sweeping Fiber Laser**

Nikita Poddubrovskii

Institute of Automation and Electrometry of the Siberian Branch of the Russian Academy of Sciences

9. **AWG-Based Interrogator for FBG Sensors**

Maxim Gaskov

Novosibirsk State University

10. **Study of the Radiation Pattern of an Integrated-Fiber Optical Phased Steering System**

Nikolai Laskavyi

Perm National Research Polytechnic University

11. Optical Frequency Domain Reflectometer for Spatial-Resolved Gas Sensing

Artem Budarnykh

Institute of Automation and Electrometry
of the Siberian Branch of the Russian
Academy of Sciences

12. Measurement of the Parameters of Lensed Fibers for Application in Integrated Photonics

Darya Sokolchik

Perm State University

Section: Power Electronics and Power Engineering

June 30, 13:30-19:30, Hall C

July 1, 9:00-11:00, Hall C

Section Chair: Denis A. Kotin, Maksim A. Zharkov

FIRST DAY.

1. **Development of CMOS PWM Controller for Driving GaN-based Switching Mode Power Converters**

   Egor Polyntsev

   National Research Tomsk State University

2. **Development of a NewGate Driver with Capacitive Isolation**

   Ivan Shishov

   Moscow Aviation Institute (National Research University)

3. **Short-Circuit Turbine Generator Package: Functional and Operational Features**

   Vladimir Zhelezniak

   Joint Stock Company "Power Machines" Production Facility "Electrosila"

4. **Device for Transmitting Signals over a Common Wireless Information and Energy Communication Channel**

   Ilya Lukoshin

   Moscow Aviation Institute (National Research University)

5. **Features of the High-Voltage Swithes (Commutators) Used on IGBT Modules**

Anastasiya Mandrueva

West Siberian Branch of The Federal State Unitary Enterprise «Russian metrological institute of technical physics and radioengineering»

6. **Mathematical Model Development for the Study of the General Primary Frequency Control in the Power Systems**

Viktoriya Fyodorova

Novosibirsk State Technical University

7. **Thermal Analysis of Induction Motor Rotor Winding During Direct On-Line Starting**

Andrey Radnaev

National Research Tomsk Polytechnic University

8. **Improving Methods for Synchronizing Generators**

Viktor Kirichenko

Novosibirsk State Technical University

9. **Spiral Capacitor Models that Consider the Capacitance and Inductance of Each Turn**

Ilya Nikolayev

Tomsk State University of Control Systems and Radioelectronics

10. **The Project of Universal Static Converter Prototype Module for Aircraft Power Converting Equipment**

Nikita Ashurkov

Novosibirsk State Technical University

11. **An On-Line Uninterruptible Power Supply with High Input Power Factor**

Anastasiia Naprienko

Novosibirsk State Technical University

12. **The Efficiency of Conductor Placement in Circuits with Single Modal Redundancy in Differential and Common Modes**

Alexandr Lakoza

Tomsk State University of Control Systems and Radioelectronics

13. **Development of a Recloser with Double-Sided Measurement Using Digital Combined Current and Voltage Sensors**

Stanislav Ponomarev

Novosibirsk State Technical University

14. **Research on Optimal Operation of Kuban HPP Cascade During the Flood Period**

Elena Anosova

Novosibirsk State Technical University

15. **Evaluation of the Effect of Essential Oil Blends on the Condition of Paper Insulation**

Marina Lyutikova

Novosibirsk State Technical University

16. **Evaluation of the Influence of AC Voltage Regulators, SVC and Unified Power Controllers on Power Losses and Quality in unsymmetrical Distribution Systems**

Ahmed Mohmed Abdelhakeem Elkholy

Tanta University

17. **Identifying The Rating of the Unified Power Controller According to Unbalanced Distribution System Requirements**

Ahmed Mohmed Abdelhakeem Elkholy

Tanta University

18. **Evaluation of Zero and Negative Sequence Currents Influence of Asymmetric Load on the Power Losses and Quality in Distribution Networks**

Ahmed Mohmed Abdelhakeem Elkholy

Tanta University, National Research University "Moscow Power Engineering Institute"

19. **Improving Accuracy of Machine Learning Based Short-Term Load Forecasting Models with Correlation Analysis and Feature Engineering**

Nikita Sergeev

Novosibirsk State Technical University

20. **Approximation of Dynamic Thermal Resistance of Power Devices**

Sergey Evdokimov

National Research University of Electronic Technology

21. **System for Centralized Collection and Storage of Data on Household Resource Consumption**

Lev Kazakov

Novosibirsk State Technical University

22. **Maintenance Optimization within the Lifecycle Management of the Gas Compressor's Electric Motors**

Alexandra Khalyasmaa

Ural Federal University named after the First President of Russia B. N. Yeltsin

23. **Development HW/SW Controller for Power System Communication with Protocols Conversion to IEK-60870-5-104 and IEK-61850**

Maksim Goltsov

National Research University "Moscow Power Engineering Institute"

24. **Modified Finite Volume Method Study For Numerical Calculation Of Lithium Battery Temperature**

Elena Punt

Moscow State Technical University of Civil Aviation

25. **Research and Development of Semiconductor Regulators Automatic Control Software-Hardware Complex (SHC) to Voltage Regulation and Improve Reliability and Power Quality for Distribution Networks 10/0.4 kV**

Egor Guryev

National Research University "Moscow Power Engineering Institute"

SECOND DAY.

1. **Evaluation of the Steepness of the Transfer Characteristic by Current of the Cycloconverter**

Regina Sarakhanova

Novosibirsk State Technical University

2. **Options Analysis for the Use of Solar Generation Systems on the Territory of Hydropower Plants**

Sergey Mitrofanov

Novosibirsk State Technical University

3. **Analysis of the Natural Inflow Short-term Forecasting Models Efficiency to the HPP Site for the Day-ahead Based on Regression Methods and Machine Learning Methods.**

Sergey Mitrofanov

Novosibirsk State Technical University

4. **Attenuation of High-Frequency PWM-Ripples in a Two-Level Voltage Source Inverter**

Oleg Vavilov

Novosibirsk State Technical University

5. **Integral Transformers State Assessment Based on Entropy and the Method of Dissolved Gas Analysis**

Alexander Zelenskikh

Novosibirsk State Technical University

6. **Neural Network Observer of the Average Value of the Inductive Current of the Buck DC Converter**

Egor Aksenov

Novosibirsk State Technical University

Section: Biomedical Electronics and Engineering

July 1, 11:00-19:30, Hall B

Section Chair: Gennady S. Evtushenko,
Konstantin S. Brazovskii, Vasilii I. Borisov

INVITED REPORT:

Topical issues related to evaluation parameters of living systems based on electrical measurements

Konstantin Brazovskii

National Research Tomsk Polytechnic University

1. **Peculiarities of Cold Plasma Jet Generation in a Non-Contact Discharge Initiation Method**

Elena Milakhina

Rzhanov Institute of Semiconductor Physics of the Siberian Branch of the Russian Academy of Sciences

2. **Biosensors and Wearable Sensors Based on Graphene Composites for Lab-on-Skin**

Dmitriy Poteryayev

Novosibirsk State Technical University

3. **Design and Development of a Research Integrated Geoinformation System with a Fuzzy Expert System**

Rustam Burnashev

Kazan Federal University

4. **The Relationships Between Characteristics of Wheezes and Spectral-temporal Parameters of Forced Expiratory Tracheal Noises**

Dmitry Strobykin

V.I.Il'ichev Pacific Oceanological Institute of the Far Eastern Branch of the Russian Academy of Sciences

5. **Recurrent Neural Network for M/EEG Source Localization**

Rodion Vakhitov

National Research University "Moscow Power Engineering Institute"

6. **Develop an EMBLE Electronic Stethoscope for Disease Diagnosis of Internal Animal Organs Using a Neural Network**

Ruslan Kumarbaev

Novosibirsk State Technical University

7. **Numerical Simulation of 8-Channel Array for Human Brain Imaging Using C-Shaped Dipole Antennas with Improved Coverage**

Kristina Popova

Saint Petersburg National Research University of Information Technologies, Mechanics and Optics

8. **Development of a Hardware Platform to Design a Digital Health Assessment System**

Andrew Shcherbachev

Bauman Moscow State Technical University

9. **Application of Thermodilution for the Development of Hydrodynamic Stands Simulating Cardiac Activity**

Andrew Shcherbachev

Bauman Moscow State Technical University

10. **Electric Field Distribution in SOI-Nanoribbon Biosensors with Dielectrophoretic Control**

Vladislav Kostyuchenko

Novosibirsk State Technical University

11. **The Method for Increasing the Detail of Voltammetric Measurements of Small Changes in Concentrations**

Maria Zolotenkova

Moscow Aviation Institute (National Research University)

12. **Prototype of the Forearm Muscle EIT Generator with Automatically Switchable Sensors for the Prosthesis Control System**

Oleg Sazonov

Moscow Aviation Institute (National Research University)

13. **Real-time Mapping of Blood Perfusion during Neurosurgical Interventions**

Dmitry Stavtsev

I.M. Sechenov First Moscow State Medical University

14. **Study of the Electrodynamic Mode in the Electrode System of the Hardware Setup for Implementing the Technique of Measuring the Polarizability of Bioparticles**

Lidiya Dmitrieva

West Siberian Branch of The Federal State Unitary Enterprise «Russian metrological institute of technical physics and radioengineering»

15. **Spectrometric Investigations of Chromophores in Biologically Active Zones Areas**

Anna Shevtsova

Novosibirsk State Technical University

16. **Issues of Interference-Resistant Processing For Electrocardiodiagnostics**

Andrey Bodin

National Research University "Moscow Power Engineering Institute"

17. **Using the Machine Learning Method in Portable ECG monitoring System to Identify Diagnostically Complex Heart Diseases**

Aidana Yerkebay

Satbayev University

18. **Development of a Blood Typing Device**

Daniil Serpenev

National Research Tomsk Polytechnic University

19. **Analysis of ECG Signals of Patients with Type 1 Diabetes Mellitus**

Zhansila Orynbay

Satbayev University

20. **Simulation of Excitation Wave Spreading in Myocardial Fibrosis**

Ruslan Rakhmatullov

Penza State University

21. **Automation of EEG Data Processing with HPC Community Cloud**

Maxim Gorodnichev

Scientific-Research Institute of Neurosciences and Medicine

22. **Development of a System for Rapid Assessment of the Dynamics of the Inflammatory Process of Periodontal Tissues**

Andrey Demidov

Penza State University

23. **Problems in the Implementation of Electrical Impedance Tomography**

Alexis Levin

Penza State University

24. **Low-cost Web-Based Stabilometry Biofeedback Trainigs**

Ksenija Iadonovskaya

Federal Research Center for Fundamental and Translational Medicine

25. **Computational Approach for Respiratory Pressure Parameters in Neonatal Ventilation**

Daria Lipchak

Joint Stock Company “Production Association “Urals Optical & Mechanical Plant” named after Mr. E. S. Yalamov”

26. **Methods of Air dust Microparticles Measuring and Recognizing for Social and Hygienic Monitoring**

Andrey Kokoulin

Perm National Research Polytechnic University

27. **Methods of Electrocardiosignal Analysis for Diagnosis of Myocardial Infarction**

Natalia Kruchinina

Penza State Technological University

28. **P300 Habituation within the Visual Stimulation Paradigm Based on Synchronous EEG and Eye Tracker Recordings: Pilot Study**

Liza Boeva

Bauman Moscow State Technical University

Section: Robotics, Mechatronics, and Automation

July 1, 9:00-13:00, Hall D

Section Chair: Oleg V. Nos,

1. **UAV Flight Control Along the Railway Using Technical Vision**

   Artem Lebedev

   Novosibirsk Division of Rzhanov Institute of Semiconductor Physics of the Siberian Branch of the Russian Academy of Sciences “Technological Design Institute of Applied Microelectronics”

2. **Decreasing Number of Geometric Feasibility Checks in Automatic Assembly Planning: A Review**

   Viktor Livantsov

   Bauman Moscow State Technical University

3. **Transient Analisis of Modified Resonant Regulators with Time Delay Compensation for PMSM Torque Ripple Reduction**

   Vyacheslav Rakhvalov

   Novosibirsk State Technical University

4. **Development of an Educational Intellectual System for the Analysis of Polymer Materials in Additive Manufacturing**

   Rustam Farahov

   Kazan Federal University

5. **Development a Prototype of an Intelligent System for Analyzing Meteorological Data Using IoT Technologies**

   Rustam Farahov

   Kazan Federal University

6. **Parametric Identification under Incomplete a Priori Information**

Anna Mizyukanova

Novosibirsk State Technical University

7. **Vibration Analysis Based on the Method of Mathematical Prototyping of Energy Processes**

Alexey Druzhunin

Moscow State Technical University of Civil Aviation

8. **Automation of Thin Film Flaw Detection Processes as a Stage in the Development of Laser Resistor Trimming Technology in Microelectronics**

Vladimir Kondrashov

Public Joint-Stock Company "Scientific and Production Association "Strela"

9. **Resonant PI Controller Design for the Electrohydraulic Drive of a Stabilized Platform System**

Tam Bui

Novosibirsk State Technical University

10. **Reviewing Fault Detection Methods in Electric Drives: Power Subsystem and Electrical Machine**

INVITED REPORT

Galina Demidova

Saint Petersburg National Research University of Information Technologies, Mechanics and Optics

11. **LMI-Based Approach for Non-Rigid System Control**

Sergey Romadov

Tula State University

12. **Fast Fourier Transformation Algorithm**

Semyon Burmanov

Novosibirsk State Technical University

13. **Model Designing of the Weft Thread Projectile Accelerator for Weaving Loom with Crank Mechanism**

Semyon Burmanov

Novosibirsk State Technical University

14. **Unmanned Aerial Vehicles with a Hybrid Propulsion System, as an Analogue of Unmanned Aerial Vehicles with Internal Combustion Engines**

Andrey Nagorny

Novosibirsk State Technical University

15. **Estimation of the Mathematical Model Parameters for a Multi-channel Electro-hydraulic Strength Test Bench**

Maksim Trubin

Novosibirsk State Technical University

16. **An Algorithm for Developing a Digital Twin Model of an Industrial Facility Segment**

Dmitry Karabanov

Novosibirsk State Technical University

17. **Creation of Corrosion-Resistant Coatings Based on Zinc in an Electromagnetic Field on Steel Punching Rivets**

Nazar Maslennikov

Saint Petersburg Electrotechnical University “LETI”

18. **Four Quadrant AC-DC Converter Control System Prototype for AC Locomotive Traction Drive**

Nikolai Poliakov

Saint Petersburg National Research University of Information Technologies, Mechanics and Optics

19. **Minimizing the Traction Factor of a Multi-Motor Belt Conveyor**

Stepan Sukhinin

Novosibirsk State Technical University

Section: Software Engineering and Cyber-Physical Systems

July 1, 11:00-16:30, Hall C

Section Chair: Vladimir E. Zyubin

1. **Approach to Research Feature Interactions**

   Nikita Radeev

   Novosibirsk State University

2. **Development of Verification Condition Generator for Process-Oriented Programs in PoST Language**

   Ivan Chernenko

   Institute of Automation and Electrometry of the Siberian Branch of the Russian Academy of Sciences

3. **Videoverification Module for Bank Customer**

   Polina Davydchenko

   Tomsk State University of Control Systems and Radioelectronics

4. **The Combined Approach to Identifying Argumentation Structures in Short Scientific Papers**

   Alexander Zasypkin

   Novosibirsk State University

5. **Formalization of Process-oriented Programs in poST Using Isabelle/HOL**

   Artyom Ishchenko

   Novosibirsk State University

6. **Parallel Matching for Graph Partitioning on Shared Memory**

Kirill Trusov

Siberian State University of Telecommunications and Information Sciences

7. **Towards Process-Oriented Programming Distributed Control Systems**

Dmitry Ivanishkin

Novosibirsk State University

8. **Using Mixed Reality for Development of Instruction for Industrial Unit Maintenance**

Maxim Denisov

Novosibirsk State Technical University

9. **Towards Controlled Natural Language for Event-Driven Temporal Requirements**

Anna Gnezdilova

Novosibirsk State University

10. **Curve Fitting for Exponential Polynomials from Interval Data**

Maxim Zvyagin

Novosibirsk State University

11. **On Parallel Sparse LU Factorization: Supernodal Left-Looking Multi-Stage Algorithm**

Ivan Karasenko

Siberian State University of Telecommunications and Information Sciences

12. **Parallel Solve Phase of a Direct Sparse Solver**

Roman Gumalevskii

Siberian State University of Telecommunications and Information Sciences

13. **Rule-based Syntactic Analysis for Uzbek Language: An Alternative Approach to Overcome Data Scarcity and Enhance Interpretability**

Davlatyor Mengliev

Novosibirsk State University

14. **Generating a Formalized REST API Definition Language for a Dynamic Framework without Annotations Using Static Analysis Tools**

Daria Usova

Novosibirsk State University

15. **Comparition of Numerical Methods for Stiff Problems in SimInTech**

Konstantin Timofeev

Novosibirsk State Technical University

16. **Using PCA Machine Learning Approach Based on Psychological Questionnaires and Spectral Characteristics of the EEG to Separate the Healthy Participants and Participants with Major Depressive Disorder**

Ekaterina Merkulova

State-Research Institute of Neurosciences and Medicine

17. **Design as a Way to Involve the End User in Information Security Issues**

Daria Archakova

Southern Federal University

18. **Identification of Suspicious Patterns and Prevention of Telephone Fraud Incidents Using a Neural Network**

Konstantin Medentsev

Tomsk State University of Control Systems and Radioelectronics

19. **Towards Conflict Resolution Methods in Process-Oriented Programs**

Dmitry Permiashkin

Institute of Automation and Electrometry of the Siberian Branch of the Russian Academy of Sciences

20. **Using Machine Learning Techniques for Assessing Media Text Readability**

Andrey Laputenko

National Research Tomsk State University

21. **Computerized Cognitive Training for Individuals Differenced by Mental Speed and Executive Functions**

Olga Razumnikova

Novosibirsk State Technical University

Section: History and Prospects for the Informatics and Electronics Development in the Context of Humanitarian Problems of Society Solving

July 1, 14:00-19:30, Hall B

Section Chair: Alexander N. Savostyanov, Grigoriy R. Khazankin

INVITED REPORT:
Neurolinguistics as an example of interdisciplinary direction on the boundary between humanitarian, biological and computer sciences.

Alexander Savostyanov
Scientific-Research Institute of Neurosciences and Medicine, Institute of Cytology and Genetics SB RAS, Novosibirst State University
Novosibirsk, Russia

1. **NSTU Dispace Education and Learning Management System as a Resource for English Learners in the Students' Perspective**

Maxim Schegolev
Novosibirsk State Technical University

2. **The Use of Information and Communication Technologies in Psychological Counseling and Psychotherapy: History, Problems and Prospects**

Natalya Panova
Novosibirsk State Technical University

3. **Developing Emotional Intelligence: Approbation of a Coaching Program with Meditation Using Information and Communication Technologies**

Natalya Panova

Novosibirsk State Technical University

4. **Development of Learning Associative Rules in the Context of Solving the Problems of Society**

Ekaterina Kolodezeva

Novosibirsk State Technical University

5. **Prospect of the Use of Digital Resources in Learning and Teaching ESL**

Elizaveta Dmitrienko

Novosibirsk State Technical University

6. **Video Identification as a Tool to Prevent Social Engineering Attacks in Finance**

Roman Muromcev

Tomsk State University of Control Systems and Radioelectronics

7. **Implementation of Individual Educational Trajectories in the Master's Programs**

Anna Busygina

Tomsk State University of Control Systems and Radioelectronics

8. **Application of Informatics and Electronics on a Linguistic Level for Handling Consubstantial Terms in Automatic Processing of Scientific Publications**

Shanglong Huang

Novosibirsk State University

9. **Students Self-Skills Developement**

Timur Gazizov

Tomsk State Pedagogical University

10. **Horizons of Development of Physics Education of Young People throught the Prism of the Big University of Tomsk**

Timur Gazizov

Tomsk State Pedagogical University

11. **Mobile Application as a Tool of Teaching Chinese Characters**

Daria Kormich

Novosibirsk State Technical University

12. **Software Application for Learning Esperanto as an Example of Education Gamification**

Ilya Doshchinsky

Siberian State University of Telecommunications and Information Sciences

13. **Prospects for Artificial Intelligence Technologies, Neural Networks and Computer Systems within the Development of Linguistics**

Irina Matveeva

Novosibirsk State Technical University

14. **Theoretical Review of Digital Tools Aimed to Development of Soft Skills During a Learning Process**

Marina Matyushina

Novosibirsk State Technical University

15. **The Phenomenon of Clip Thinking and Its Role in Electronic Educational Environment**

Stanislav Stoliarov

Novosibirsk State Technical University

16. **The Use of Web-Portfolio Technology for Professional Foreign Language Training of Students in Electronic Educational Environment of Higher education institutions**

Olga Kiryakova

Novosibirsk State Technical University

17. **Information Resilience: Operationalisation of the Concept and Results of Pilot Empirical Researches**

Valeria Kapustina

Novosibirsk State Technical University

18. **Psychological Aspects of Digital Technologies in Education**

Sofya Efremova

Novosibirsk State Technical University

19. **ICT and Mental Health of Professionals Working from Home**

Anna Osintseva

Novosibirsk State Technical University

20. **The Use of Artificial Inteligence in Education: Opportunities, Limitations, Risks**

Arina Mindigulova

Novosibirsk State Technical University

21. **The Use of Information Technologies in the Process of Implementing Inclusive Educational Practice**

Elena Beketova

Novosibirsk State Technical University

22. **Problem-based Approach to Teaching Linguistics Students to Pre-edit Texts for Machine Translation**

Sofiya Stenina

Novosibirsk State Technical University

23. **Research of Electronic Platforms for Psychological Services**

Evgenia Bykova

Novosibirsk State Technical University

Young Professionals Involvement Competition

July 1, 16:30-19:30, Hall C

Section Chair: Anna S. Kazmina

1. **Methodology for Calculation of Elastic Constants of Diamane by Molecular Dynamics**

   Polina Polyakova

   Ufa State Petroleum Technological University

2. **Formation of the Electric Field Strength Maximum at a Given Point in Space by a Focused Linear Antenna Array**

   Denis Iuzvik

   Novosibirsk State Technical University

3. **Applying Decision Forest for Improving the Adaptation of the ML Algorithm for Beamsteering to Traffic Dynamics in V2I Systems**

   Ekaterina Lopukhova

   Ufa State Aviation Technical University, Ufa University of Science and Technology

4. **Influence of Clean Conditions on the Current-Voltage and Switching Characteristics of the Glow Discharge**

   Gleb Shevchenko

   Rzhanov Institute of Semiconductor Physics of the Siberian Branch of the Russian Academy of Sciences

5. **Development of One-Coordinate Detector for Diffraction Experiments at a Synchrotron Radiation Beam**

   Anastasiia Glushak

   Budker Institute of Nuclear Physics of the Siberian Branch of the Russian Academy of Sciences

6. **Synchronization Device of the Specialized Source of Synchrotron Radiation «Sibir-2» of the Kurchatov Institute**

Timofey Abramets

Budker Institute of Nuclear Physics of the Siberian Branch of the Russian Academy of Sciences

7. **Cryogenically-Cooled Stabilized Power Factor Correction Rectifier for Future Aircraft Electrical Systems**

Aleksey Alekseev

Moscow Aviation Institute (National Research University)

8. **Development of a Recloser with Double-Sided Measurement Using Digital Combined Current and Voltage Sensors**

Stanislav Ponomarev

Novosibirsk State Technical University

9. **Peculiarities of Cold Plasma Jet Generation in a Non-Contact Discharge Initiation Method**

Elena Milakhina

Rzhanov Institute of Semiconductor Physics of the Siberian Branch of the Russian Academy of Sciences

10. **Numerical Simulation of 8-Channel Array for Human Brain Imaging Using C-Shaped Dipole Antennas with Improved Coverage**

Kristina Popova

Saint Petersburg National Research University of Information Technologies, Mechanics and Optics

11. **Towards Controlled Natural Language for Event-Driven Temporal Requirements**

Anna Gnezdilova

Novosibirsk State University