



APEIE 23

Actual Problems
of Electronic Instrument
Engineering

11.10-12.23

CONF PROGRAM



APEIE 2023 Schedule

Section 1	1. Electronic Devices, Nanotechnology and Microsystem Technology
Section 2	2. Medical Electronic Devices
Section 3	3. Electrical Engineering and Power Engineering
Section 4	4. Radio Engineering and Telecommunication Systems
Section 5	5. Automation and Information-measuring Technologies
Section 6	6. Mathematical Modeling of Processes and Systems
Section 7	7. Optical and Laser Technologies
KNOTH	International Symposium on Knowledge, Ontology, and Theory (KNOTH)
YPI	Young Professionals Involvement (YPI) Competition

10.11.2023						
Hall name		Ignis	Aero	Terra	Meeting room	Cabinet
Coffee break	9:00-10:00	Winter garden 1st floor				
Opening	10:00-12:45	Plenary session				
Dinner	13:00-14:00	Restaurant 2nd floor				
Section work	14:00-16:00	Section 1	Section 4	YPI	Section 5	Section 7
Coffee break	16:00-16:30	Winter garden 1st floor				
Section work	16:30	Section 1	Section 4	YPI	Section 5	KNOTH

11.11.2023						
Hall name		Ignis	Aero	Terra	Meeting room	Cabinet
Coffee break	9:00-10:00	Winter garden 1st floor				
Section work	10:00-13:00					
Section work	11:00-13:00	Section 2	Section 4	Section 3	Section 5	Section 6
Dinner	13:00-14:00	Restaurant 2nd floor				
Section work	14:00-16:00	Section 2	Section 4	Section 3	Section 5	Section 6
Closing	16:00	Closing of the conference				
Buffet	17:00	Restaurant 2nd floor				

12.11.2023						
Hall Domina	11:00	Excursion around the center of Novosibirsk				

Time zone - UTC+7 NOVT

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- online report

Plenary Session

November 10th, 10:00-12:30, Hall Ignis - Aero

1. **Conference Opening Ceremony – 10:00**

Sergey V. Brovanov
Conference Chair
NSTU

Anatoly Bataev
Rector, NSTU

Vasily Yanpolsky
First Vice-Rector, NSTU

Artur Otto
Vice-Rector for Research, NSTU

Roman Gorbunov
IEEE Chairman

2. **Problems of Voltage Regulation in 0.4 Kv Distribution Electric Networks**

Vladimir Gerasimov
JSC Regional Electric Grids

3. **A New Method and Device of Voltage Normalization in Electric Grids**

Alexander Klavsuts
Scientific Industrial Enterprise LLC "NORMEL"

4. **ООО НПФ "Energiya"**

Vladimir Fomichev
ООО НПФ "Energiya"

5. Technologies of Machine Translation of Sign Languages of the Beaf

Mikhail Grif
Novosibirsk State Technical University

6. Alfa-Chance

Andrei Fischer
Alfa-Bank

Section: Electronic Devices, Nanotechnology and Microsystem Technology

November 10th, 14:00-19:30, Hall Ignis

Section Chair: Valery P. Dragunov, Dmitriy I. Ostertak

INVITED REPORT:

Polymer Composite Materials as Functional Elements for Electronics

Vitalii Anatolievich Kuznetsov

Nikolaev Institute of Inorganic Chemistry of the SB RAS;
Novosibirsk State Technical University

1. Thermal Analysis of 3D Heterogeneous Integration for Microwave HEMTs

Alexander Efimov

"Istok" named after Shokin"

Alexander S. Efimov, Alexander V. Grusha

2. Tunable Impedance Transformer Based on J-Invertors for Load Modulated Power Amplifier

Irina Filipyuk

Saint Petersburg Electrotechnical University 'LETI'

Irina A. Filipyuk, Pavel A. Turalchuk

3. Development of Specialized Integrated Circuits for Coordinate X-ray Detectors

Anastasiia Glushak

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

Anastasia A. Glushak, Vladimir V. Zhulanov, Lev I. Shekhtman, Vladimir M. Aulchenko

4. Investigation of the Phase Composition and Structural Parameters of Aluminum Nitride Thin Films Obtained by Magnetron Sputtering

Larisa Baranova



Omsk State University named after F.M. Dostoevsky;
Institute of Radiophysics and Physical Electronics of
Omsk Scientific Center

Larisa V. Baranova, Bibigul T. Baisova, Vladimir I. Strunin

5. Investigation of the Influence of Heterostructure on the Parameters of Microwave Transistors



Alexandr Shesterikov

AO «NPF «Micran»

Alexandr E. Shesterikov, Darya A. Shesterikova, E. Erofeev, Evgeniy V. Erofeev

6. Methodology of Circuit modeling of Charge-Sensitive Amplifiers Based on Wide-Band-Gap (GaAs, GaN) D-FETs



Vladislav Chumakov

Don State Technical University

Oleg V. Dvornikov, Vladislav E. Chumakov, Vladimir A. Tchekhovskiy, Dmitriy V. Kleimenkin, Nikolay N. Prokopenko

7. Geometric Parameterized Modal Superposition Based Macromodel of Uniaxial Capacitance Accelerometer

Aleksandr Gridchin

Novosibirsk State Technical University

*Aleksandr V. Gridchin, Aleksei N. Koleda, Evgenii S. Barbin, Tamara G. Nesterenko,
Vladimir A. Kolchuzhin*

8. Thermal Modelling of Half-bridge IC with On-chip Drivers and Power e-HEMT Based on GaN-on-SOI Platform

Irina Kodorova

Tomsk State University

Irina Y. Kodorova, Egor S. Polyntsev, Valery A. Kagadey

9. MMIC GaAs Power Limiter on 30 GHz with a Small Flat Leakage Power

Alexander Grusha

JSC "RPC "Istok" named after Shokin"

Alexander V. Grusha, Alexander S. Rebrov

10. Switched-Capacitor Low-Pass Filter with Pole Frequency Tuning at Constant Frequency of Switching



Dmitry Kuznetsov

Don State Technical University

Darya Y. Denisenko, Alexey E. Titov, Irina A. Alferova, Dmitry V. Kuznetsov

11. Synthesis of Thin Film Structures of Zirconium Oxide by Spray Pyrolysis



Timur Zinchenko

Penza State University

Timur O. Zinchenko, Oleg V. Karpanin, Ekaterina A. Pecherskaya, Pavel E. Golubkov, Sergey A. Gurin, Maxim D. Novichkov

12. Synthesis of Heterogeneous Catalytic Structures on the Surface of Ion-Exchange Membranes



Maksim Novichkov

Penza State University

Maksim D. Novichkov, Sergey A. Gurin, Sergey A. Nesterov, Dmitry A. Shelakhaev, Ekaterina A. Pecherskaya, Anastasia A. Shepeleva

13. Clock Network Design Challenges



Pavel Kuzmin

National Research University of Electronic Technology
(MIET)

Pavel A. Kuzmin

14. Architecture of a Validation Block in Silicon for Libraries of Standard Elements Based on a Pipeline-Distribution Approach



Sergey Ilyin

JSC "Molecular Electronics Research Institute"

Sergey A. Ilyin, Dmitry Yu. Kopeikin, Oleg V. Lastochkin, Anton A. Novikov, Dmitry S. Shipitsyn

15. The Effect of Electromechanical Coupling on the Bennet Doubler Based Vibration Energy Harvester

Maksim Kuznetsov

Novosibirsk State Technical University

Dmitriy I. Ostertak, Maksim A. Kuznetsov, Valery P. Dragunov

16. A New Revolution in Logic Silicon IC Technology: GAA FETs are Replacing FinFETs

Dmitriy Poteryaev

Novosibirsk State Technical University

Sergey V. Kalinin, Dmitriy A. Poteryaev, Dmitriy I. Ostertak, Maksim A. Kuznetsov

17. Studying C V Characteristics of MIS Structures with PE ALD Al₂O₃ on HgCdTe Oxidized in Remote RF Plasma

Evgeny Zakirov

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

Evgeny R. Zakirov, Valeriy G. Kesler, Georgiy Yu. Sidorov

Section: Medical Electronic Devices

November 11th, 11:00-16:00, Hall Ignis

Section Chair: Liliya I. Lisitsyna

1. Fluctuation Dielectric Fourier Spectrometer for Estimation of Blood Cellular Components

Anton Kovalev

Krasnoyarsk Scientific Center

*Anton V. Kovalev, Olga V. Kryukova, Vladislav G. Soukhovolsky, Anna N. Maltseva,
Yury I. Grinstein*

2. Reference Generators for Medical Electronic Devices to the Evaluating of Biological Objects Electrophysical Parameters

Nikolay Yumagulov

Nizhnevartovsk state university

*Nikolay I. Yumagulov, Anvar L. Galiev, Dmitry V. Topolsky, Dmitriy A. Fedorov, Elena
A. Zvereva, Konstantin V. Khatsevsky*

3. Characteristics of Cold Plasma Jet Initiated by Non-Contact and Contact Pulse Voltage

Elena Milakhina

Khristianovich Institute of Theoretical and Applied
Mechanics of the Siberian Branch of the RAS,
Novosibirsk State Technical University

Pavel P. Gugin, Elena V. Milakhina, Dmitry E. Zakrevsky

4. Influence of Physiological Determinants on Acoustic Parameters of Forced Expiratory Tracheal Sounds

Maria Safronova



V.I.Ilichev Pacific Oceanological Institute, Far
Eastern Branch, Russian Academy of Sciences

Irina A. Pochekutova, Maria A. Safronova, Dmitrii S. Strobyskin

5. Biofeedback in Rehabilitation (modern review)



Elizaveta Tarasova

Ural State Medical University

Elizaveta M. Tarasova, Timur S. Petrenko, Vasilii I. Borisov

6. Modeling of Methylated DNA Determination by Means of Ultrashort Laser Pulses



Anastasya Kharlamova

Federal State Autonomous Educational Institution of
Higher Education «Northern (Arctic) Federal
University named after M.V. Lomonosov»

Anastasia A. Kharlamova

7. Development of a System of Reception and Transmission of Biomedical Signals Based On Ultrasound Technology



Behruz Saidov

South Ural State University

Behruz B. Saidov

8. Preliminary Studies of the Characteristics of the Incision of the Skin in Vivo Using Electromagnetic Radiation with a Frequency of 27.12 MHz and its Effect on a Living Object

Dmitriy Kuleshov

Novosibirsk State Technical University

*Svetlana V. Belavskaya, Alexander V. Romashchenko, Lilia I. Lisitsyna, Vladimir P.
Razinkin, Dmitry N. Kuleshov, Anton N. Kuzmin*

9. Feasibility of Spine Segmentation in ML-Based Recognition of Vertebrae in X-Ray Images

Maxim Bakaev

Novosibirsk State Technical University

*Maxim A. Bakaev, Denis A. Kobzev, Dmitry K. Piletskii, Alexander A. Yakimenko,
Alexander V. Gladkov*

10. Gender Specificity in Exergaming for Therapy and Rehabilitation

Olga Razumnikova

Novosibirsk State Technical University

Olga M. Razumnikova, Sergey A. Ereemeev, Maxim A. Bakaev, Wei Zhang

11. Device for Early Pregnancy Diagnostics in Cattle

Aleksandr Pavlov

Novosibirsk State Technical University

Aleksandr V. Pavlov

12. Factors Affecting the Process of Microwave Sterilization of Medical Instruments



Vil Baiburin

Yuri Gagarin State Technical University of Saratov

Vil B. Baiburin, Vyacheslav V. Komarov, Alexandr A. Nikiforov, Valentina M. Doroshenko, Valery P. Meshchanov

13. Study of Changes in the Electrochemical Parameters of Periodontal Tissues in the Postoperative Period



Andrey Demidov

Penza State University

Andrey V. Demidov, Michael V. Demidov, Sergey M. Gerashchenko

14. Features of Smartphone Diagnostics of Human Health Based on Gait Parameters



Maxim Goryachev

Vladimir State University

Nikolay V. Dorofeev, Maxim S. Goryachev, Ruslan V. Sharapov, Roman V. Romanov

15. Developing a Pulse Wave Model Using the Lumped Element Method



Viktor Karnaukhov

Penza state university

Viktor V. Karnaukhov, Sergey M. Gerashchenko

Section: Electrical Engineering and Power Engineering

November 11th, 10:00-16:00, Hall Terra

Section Chair: Denis A. Kotin

1. Achieving Maximum Torque for Synchronous Reluctance Motor over Its Entire Speed Range

Alecksey Anuchin

Moscow Power Engineering Institute

*Timopheyy Maslennikov, Artemy Zolotov, Ruslan Khismatullin, Alexandr Prudnikov,
Ksenia Fedorova, Alecksey Anuchin*

2. The Process of Primary Frequency Control of the Power Systems Investigation Using Modeling Methods

Viktoriya Fyodorova

Novosibirsk State Technical University

Viktoriya A. Fyodorova, Viktor F. Kirichenko, Anastasiya G. Rusina, Gleb V. Glazyrin

3. Medium-Term Forecast of Water Inflow to the Sayano-Shushenskaya Hydroelectric Power Plant Reservoir by Autoregressive Machine Learning Models

Natalia Cheganova

Novosibirsk State Technical University

Natalia F. Cheganova, Pavel V. Matrenin, Sergey V. Mitrofanov

4. High-Frequency Transformer Development for Compact Dual Active Bridge Converters

Galina Demidova

ITMO University

*Aleksandr Usolchev, Jackson J. Justo, Dmitry Lukichev, Galina Demidova, Nikolai
Poliakov, Aleksandr Lukin*

5. Choosing a Policy of Power Equipment Repairs Management. Methodology of Assessment and Decision-Making



Diana Boyarova

Novosibirsk State Technical University

Vladimir M. Levin, Nikolay P. Guzhov, Diana A. Boyarova

6. Motor Current Signature Analysis for Identification Induction Motor Defects



Ilya Dymov

Novosibirsk State Technical University

Ilya S. Dymov, Denis A. Kotin, Georgy S. Sidorov

7. Method for Identifying the Source of Higher Harmonics in the Power System



Tatiana Myateg

Novosibirsk State Technical University

Tatiana V. Myateg, Dmitry E. Shevtsov, Valentine Y. Lyubchenko, Ilya A. Korzhikov, Svetlana V. Rodygina, Aleksandr S. Ostretsov

8. Daily Load Profiles Clustering of R egional Distribution Grid 6 10 kV



Anton Korneev

Kuzbass State Technical University

Vyacheslav A. Voronin, Fedor S. Nepsha, Anton S. Korneev

9. First-Order Circuits Current Calculation by Method of Differential Equations Algebraization

Nikolay Lopatkin

Shukshin Altai State University for Humanities and Pedagogy

Nikolay N. Lopatkin

10. Clarke-Park Coordinates Transformation in the Quaternion Domain

Oleg Nos

Novosibirsk State Technical University

Oleg V. Nos, Natalya I. Nos

11. Use of Gravity Energy Storage Devices in Electric Drives of Vehicles

Anatoliy Sapsalev

Novosibirsk State Technical University

Anatoly Sapsalev, Olga Davydenko, Vadim Bogdanov, Elena Kasatkina, Nikolay Savin, Konstantin Kuratov

12. Measurement and Analysis of Electrical Conductivity of Transformer Oil Based Nanofluid

Vladimir Shevchenko

Novosibirsk State Technical University

Sergey M. Korobeynikov, Vladimir E. Shevchenko, Alexander V. Ridel

13. About the Problems of System Design of Machine-electric Generating Systems for Autonomous Objects

Min Myo



National Research University "Moscow Power Engineering Institute"

Myo M. Thant, Gennady S. Mytsyk

14. Synthesis and Modeling of a New Topology of Single-Phase Multilevel Voltage Inverters with Amplitude-Pulse-Width Modulation of the Output Voltage

Min Myo



National Research University "Moscow Power Engineering Institute"

Myo M. Thant, Gennady S. Mytsyk

15. Converting the HFCT Voltage Output Signal to Apparent Charge of Partial Discharge

Ilya Shmakov

Novosibirsk State Technical University

Ilya V. Shmakov

16. Organization of Monitoring of Even Harmonics Amplitudes in the Electric Networks of the Altai Republic as an Indicator of Space Weather

Evgeniy Uchaikin

Gorno-Altai State University

Evgeniy O. Uchaikin, Alexey Y. Gvozdev

17. Synthesis of an Automatic Control System for the Excitation System of a Three-stage Synchronous Generator

Oleg Vavilov

Novosibirsk State Technical University

Oleg A. Vavilov, Maksim A. Zharkov, Dmitriy A. Vedernikov

18. Analysis of Electromagnetic Processes of the Voltage Control Unit of the Excitation Winding of a Three-stage Starter Generator

Dmitriy Vedernikov

Novosibirsk State Technical University

Dmitriy A. Vedernikov, Oleg A. Vavilov, Regina Yu. Sarakhanova, Maksim A. Zharkov

19. Mode Optimization of a Hybrid Power Supply System Based on Criterion of Minimizing Fuel Consumption in a Diesel Power Plant

Mariya Zhilnikova

Novosibirsk State Technical University

Elena I. Anosova, Mariya M. Zhilnikova, Natalia V. Zubova, Sergey V. Mitrofanov

Section: Radio Engineering and Telecommunication Systems

November 10th, 14:00-18:00, Hall Aero

November 11th, 11:00-16:00, Hall Aero

Section Chair: Alexey G. Vostretsov, Andrei V. Nikulin,

THE FIRST DAY:

1. The User Equipment Mobility Affection on 5G New Radio Scheduler Performance in Novosibirsk Urban Area

Ruslan Akhпасhev

Siberian State University of Telecommunication
and Information Science

Ruslan V. Akhпасhev, Vera G. Drozdova

2. The Nesterov Momentum Algorithm for the 5G NR Indoor Scenario Coverage Optimization

Danil Ozerov

Siberian State University of Telecommunications
and Informatics

Ruslan V. Akhпасhev, Danil A. Ozerov, Ivan D. Kochkin, Egor D. Bolotov, Andrey V. Yushchenko

3. Performance Evaluation of Optimal Precoder Design for Multiuser MISO Channel with Delayed CSI

Aleksander Kalachikov

Siberian State University of
Telecommunications and Information Science

Alexander A. Kalachikov

4. Quasi-Chaotic Microwave Oscillations: Formation, Application to Test Vector Network Analyzers

Artush Arutyunyan

Tomsk State University of Control Systems and
Radioelectronics

*Artush A. Arutyunyan, George A. Malyutin, Nickolay D. Malyutin, Dmitriy E.
Minenko, Aleksandr A. Artamonov, Aleksandr A. Tomashevich*

5. Spatial Spectral-Time Functions of Vehicle Noise in Geomonitoring Tasks

Vladimir Dobrorodny

Tyumen Higher Military Engineering Command
School named after Marshal of Engineer Troops
A.I. Proshlyakov

Oksana A. Kopylova, Vladimir I. Dobrorodny, Marat S. Khairtdinov

6. The Novel Passive Devices for S-Band Satellite Amplifiers on a Base of the Nolen Beam-Forming Networks

Anatoliy Gorbachev

Novosibirsk State Technical University

Alisa E. Danilova, Anatoly P. Gorbachev, Kristina A. Tsikolenko

7. Analytical Models for Calculating the Time Response of Two-Conductor Asymmetric Transmission Lines



Evgeniya Chernikova

Tomsk State University of Control Systems and
Radioelectronics

Evgeniya B. Chernikova, Valerii P. Kosteletskii

8. Compact Filters on Dielectric Paper Substrate



Sergey Krutiev

Southern Federal University

Sergey V. Krutiev, Varvara P. Sdobnova, Alexey N. Grizodub, Sergey P. Bukin

9. Ant Colony Algorithm for Placing Electronic Components on a Printed Circuit Board, Taking into Account the Thermal Compatibility Criterion*



Ilya Suzdaltsev

Kazan National Research Technical University
named after A. N. Tupolev – KAI

Ilya V. Suzdaltsev, Vladimir A. Suzdaltsev, Nelli Y. Bogula

10. Synthesis and Performance Analysis of EKF for Processing Measurements of UWB ToF/AoA LNS with Long Baseline and IMU



Nikita Petukhov

Moscow Power Engineering Institute

*Nikita I. Petukhov, Stepan V. Orobchenko, Kirill V. Kochka, Artyom D. Evseev,
Vladimir N. Zamolodchikov, Oleg V. Glukhov*

11. Solving the Problem of Forming a Digital Communication Channel over the Power Supply Network Based on Pulse-frequency Telegraphy



Anastasia Kosolapova

Moscow Aviation Institute

Anastasia O. Kosolapova, Maria K. Zolotenkova, Vasily V. Egorov

12. Peculiarities of Measurement of Relative Permittivity of Materials Considering External Influencing Factors

Alexander Malkin

Ural Federal University

*Alexander I. Malkin, Viktor A. Chechetkin, Alexey N. Korotkov, Nadezhda G.
Razgulyaeva*

13. Generator and Oscilloscope Method

Aleksey Bakulin

Federal State Unitary Enterprise «VNIIFTRI»

Aleksey A. Bakulin, Aleksey S. Zavgorodniy

**14. Study of the GNSS Signal Satellite-Specific Bias Stability
Using Pseudorange Observations**

Ekaterina Karaush

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

Ekaterina A. Karaush, Dmitry S. Pecheritsa

15. The Simulation Model of the MIMO Radar Antenna Array

Vadim Sokolov

Novosibirsk State Technical University

*Artemy O. Podkopayev, Maksim A. Stepanov, Vadim S. Sokolov, Vadim V.
Artyushenko*

THE SECOND DAY

**1. On the Effect of Sudden Failures and Control Errors of the
First Kind on the Degradation Cycle of an Optical Cable**

Irina Kvitkova

Siberian State University of Telecommunications
and Information Science

Viatcheslav P. Shuvalov, Boris P. Zelentsov, Irina G. Kvitkova

**2. Printed Direction Finding Antenna Array Based on a Center-
End Feed Dipole-Like Radiator**

Andrei Kolesnikov

Novosibirsk State Technical University

Andrey A. Kolesnikov, Sergey A. Alekseytsev, Anatoly P. Gorbachev

**3. Influence of Fittings of Drill Pipe Ultrasonic Signal
Dampening in a Well**

Daniil Grigorev

Novosibirsk State Technical University

*Oleg V. Stukach, Ivan A. Ershov, Sergey V. Bykov, Daniil A. Grigorev, Igor V.
Trubin*

4. Influence of Digital Map Discreteness on Low Angle Land Clutter Modeling

Margarita Oreshkina

Novosibirsk State Technical University

Margarita V. Oreshkina

5. The Influence of Electromagnetic Absorber on Crosstalk and Signal Integrity of Coupled Transmission Lines

Yuri Kalashnikov



Tomsk University of Control Systems and Radio
Electronics

Ilya A. Ivantsov, Yuri V. Kalashnikov, Yevgeniy S. Zhechev

6. Simulating an Asymmetric Structure with Double Modal Reservation

Sergey Morozov



Tomsk State University of Control Systems and
Radioelectronics

Sergey R. Morozov, Artem V. Medvedev

7. Comparative Analysis of C/OCGA Sparse Horn Antenna Structures at Different Frequencies

Manh Tuan Nguyen



Tomsk State University of Control Systems and
Radioelectronics

Manh Tuan Nguyen, Adnan F. Alhaj Hasan, Talgat R. Gazizov

8. Miniaturization of Microwave Devices by Using Three-Dimensional Strip Line Design

Thanh Trinh



Tomsk State University of Control Systems and
Radioelectronics

Trinh T. Thanh, George A. Malyutin, Dmitry V. Bilevich

9. Broadband Signals Combiner on Suspended Striplines

Vladislav Pozdnyakov

Tomsk State University of Control Systems and
Radioelectronics

Vladislav S. Pozdnyakov, Edward V. Semyonov,

**10. Modeling of Four-wave Mixing in Optical Multiplexing
Networks with Wavelength Division Multiplexing**

Vladimir Karlin

Siberian State University of Telecommunications
and Information

Vladimir E. Karlin

11. Modern High-Frequency Sound Emitters Distortion Analysis

Maxim Shushnov

Siberian State University of Telecommunication
and Information Science

Maxim S. Shushnov, Tatiana V. Shushnova, Anna M. Onoprienko

**12. Errors in Setting the Angular Position in Matrix Simulators
due to the Nonlinearity of the Direction Finding
Characteristics of the Antenna**

Anton Tayurov

Novosibirsk State Technical University

Anton V. Tayurov, Aleksey V. Kiselev

**13. The Average Value of the Error of Setting the Angular
Position of a Distributed Object when Modeling with a Matrix
Simulator**

Anton Tayurov

Novosibirsk State Technical University

Anton V. Tayurov, Aleksey V. Kiselev

Section: Automation and Information-measuring Technologies

November 10th, 14:00-18:00, Hall Meeting room

November 11th, 10:00-16:00, Hall Meeting room

Section Chair: Galina A. Frantsuzova, Viktor A. Trushin

THE FIRST DAY

1. Extremum Seeking Control for Low Order System via Sliding Mode

Galina Frantsuzova

Novosibirsk State Technical University

Galina A. Frantsuzova

2. On Linear Algebraic System Forming in Parametric Identification Problems

Anna Miziukanova

Novosibirsk State Technical University

Anna A. Miziukanova, Gennady P. Chikildin

3. Stabilized Platform Control System Design Based on Time-Scale Separation Method

Van Tam Bui

Novosibirsk State Technical University

Bui Van Tam, Valery D. Yurkevich

4. Neurocontroller Training with Using the Neural Network Emulating the Plant



Victor Shipagin

Novosibirsk State Technical University

5. Algorithm for Finding a Descriptive Path for Delivering Cargo to Hard-to-Reach Areas



Eleonora Shevketova

Southern Federal University

Valeria Brovkina, Alexander Ermakov, Eleonora S. Shevketova, Natalia N. Chernetskaya, Elena S. Basan

6. Checking the Operability of the Social Media Collection and Predictive Analysis System



Ivan Kalytyuk

Novosibirsk State Technical University

Ivan S. Kalytyuk, Galina A. Frantsuzova, Andrey V. Gunko

7. Total Energy Flight Speed and Altitude Control for a Small UAV: Simulation and Flight Experiment

Alexander Maltsev

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

Sergey A. Belokon, Yuri N. Zolotukhin, Alexandr S. Maltsev

8. Single-bunch Monitor of the Position and Intensity of the SR Beam for the Station "Fast Processes" of the Synchrotron Radiation Facility "SKIF"

Maxim Kornievskiy

Novosibirsk State Technical University

Maxim A. Kornievskiy, Anastasia A. Glushak, Lev I. Shekhtman, Vladimir M. Aulchenko

9. Technique for Evaluating the Effectiveness of the Information Security Department



Dmitry Kosov

Novosibirsk State Technical University

Viktor M. Belov, Nadezhda V. Belova, Tamara M. Pestunova, Dmitry L. Kosov

10. Input-output Module of Control Software for Servo Hydraulic Drives with Hydrostatic Guides



Alexander Beliakov

South Ural State University (national research university)

Dmitry V. Topolsky, Alexander E. Beliakov, Nikita D. Topolsky, Nikolay I. Yumagulov, Elena A. Zvereva, Tatiana V. Gonenko

11. Evaluating the Effectiveness of the Least Squares Technique to Improve the Efficiency of the Phase Increment Analysis Method



Anton Pavlovich

National Research University "Moscow Power Engineering Institute"

Anton V. Pavlovich, Darya S. Evtekhova, Andrey N. Serov

12. Application of Data Mining Technologies for Processing Results of Experimental Studies

Andrew Goonko

Novosibirsk State Technical University

Andrew V. Goonko, Gennady V. Seroklinov, Fedor S. Golubkov, Eugenij S. Devyatkin

13. Assessing GBM-Model Characteristics for Improving GNSS Standard Positioning

Vladislav Zhilinskiy

Federal State Unitary Enterprise "National Research Institute of Physicotechnical and Radio Engineering Measurements" (FSUE "VNIIFTRI")

Vladislav O. Zhilinskiy

14. Management of the Cyber Range Functionality Based on the Analysis of the Digital Footprint of Students



Shamil Khanbekov

Tyumen State University

Alexander A. Zakharov, Irina G. Zakharova, Shamil I. Khanbekov, Dmitriy A. Korenev

15. The Creation and Integration of the Technological Workflow for Software and Hardware-Software Development



Egor Malyshev

National Research Nuclear University MEPhI

Evgeny A. Basinya, Egor A. Malyshev

16. Module for Collecting, Processing and Aggregating Data of the Transaction Analysis System on the Bitcoin Network



Nikolay Karapetyants

National Research Nuclear University MEPhI

Evgeny A. Basinya, Mark Karapetyants, Nikolay Karapetyants, Konstantin G. Kogos

17. Methodology for Detecting Attacks in the Context of Destructive Influences



Nikita Sushkin

Southern Federal University

Elena S. Basan, Nikita A. Sushkin, Liudmila K. Babenko

THE SECOND DAY

1. Principles of Organizing a Software-Analytical System for Parallel Processing of Seismic Data



Alexey Vyrodov

Institute of Computational Mathematics and
Mathematical Geophysics SB RAS

Alexey V. Vyrodov, Vladislav A. Perepelkin, Marat S. Khyretdinov, Alena V. Khrypchenko

2. Multi-stage Fuzzy Controller for a Multi-motor System



Kirill Emelyanov

Komsomolsk-na-Amure State University

Sergej P. Cherniy, Kirill A. Emelyanov

3. Construction of an Algorithm and an Automated System for Assessing the Quality of Regulatory Legal Acts



Dmitry Kosov

Novosibirsk State Technical University

Viktor M. Belov, Dmitry L. Kosov, Artem V. Kablikhin

4. Audit of Significant Objects of Critical Information Infrastructure



Anastasia Sitskaya

Siberian State University of Geosystems and
Technologies

Anastasia V. Sitskaya, Valentin V. Selifanov, Alexandr Yu. Soldatov

5. Application of IEC 60870 and 61850 Standards in Energy Storage Systems

Evgeny Romanov

Novosibirsk State Technical University

Evgeny L. Romanov, Sergei A. Menzhulin

6. Towards Collaborative Coding in RIDE Web IDE

Vladimir Bondarchuk

Institute of Automation and Electrometry of the
Siberian Branch of the RAS

Ilya A. Gornev, Vladimir V. Bondarchuk

7. Developing EDTL IDE Kernel with Xtext Framework



Anastasia Kozlova

Novosibirsk State University

Anastasia V. Kozlova, Vladimir E. Zyubin, Natalia O. Garanina

8. Super-resolving Seismic Locating Algorithm for Reflected Waves Hodographs Approximation



Evgeny Rabinovich

Novosibirsk State Technical University

Evgeniy V. Rabinovich, Grigory S. Shefel

9. A HUD-based Platform for Environmental Sensing and Measurement: Design and Implementation



Wu Kunlun Wu

Independent Researcher

Kunlun Wu

10. Computing Technology Acoustic Inversion Engineering Seismic Data and Its Application for Construction Purposes

Elena Goshko

Novosibirsk State Technical University

Elena Yu. Goshko, Sergey M. Zerkal , Sergey S. Ivanov

11. Computational-Heuristic Algorithm for Tomographic Solution of Industrial Flaw Detection Problems

Alexander Peshkov

Novosibirsk State Technical University

Alexander V. Peshkov, Sergey M. Zerkal

12. Determination of the Earth's Gravitational Field Parameters Based on Inter-satellite Measurements between Cubesat-type Nanosatellites

Sergei Donchenko

All-Russian Scientific Research Institute for
Physical-Engineering and Radiotechnical
Metrology

Vyacheslav F. Fateev, Sergey S. Donchenko, Ruslan A. Davlatov

13. Digital Twin of a Vibration System for Active Geomonitoring of the Environment



Aleksandr Yakimenko

Novosibirsk State Technical University

Marat S. Khairtdinov, Aleksandr A. Yakimenko, Evgenii V. Nishlyaev

14. The Use of Information-measuring Technologies for the Load Condition Monitoring



Irina Topolskaia

South Ural State University (national research
university)

*Dmitry V. Topolsky, Irina G. Topolskaia, Veronica A. Beliakova, Julia G. Plaksina,
Nikolai A. Samolovov, Alexandra N. Samolovova*

15. Improving the Accuracy of Power Grid Frequency Measurements Using a Method Based on the Analysis of Phase Increment



Vladimir Korshunov

National Research University "Moscow Power
Engineering Institute"

Vladimir V. Korshunov, Aleksei E. Kharinov, Andrey N. Serov

16. Adjustment of the Method for Estimating the Volume Level of a Signal with Arbitrary Intensity and Frequency in Sound Dosimetry Problems

Maxim Chirikov

Novosibirsk State Technical University

Maxim A. Chirikov, Victor A. Trushin

17. Fast Algorithm for Dynamic Range Expansion of Images in Optoelectronic Measurement Systems

Sergey Ilinykh

Novosibirsk State Technical University

Vladimir I. Guzhov, Sergey P. Ilinykh, Dmitry S. Khaidukov

18. VNA Instrumental Phase Error Influence on the Calculation Accuracy of the Dielectric Permittivity

Yana Petenenko

Tomsk State University of Control Systems and
Radioelectronics

Yana A. Petenenko, Vladislav S. Pozdnyakov, Evgenii I. Trenkal

19. A Technique for Measuring the Frequency of Electrical Power Network Based on Spectral Analysis with Application of Henning Window



Aleksei Kharinov

Moscow Power Engineering Institute

Aleksei E. Kharinov, Vladimir V. Korshunov, Andrey N. Serov

20. Software Complex "Sirius" for Processing Paleomagnetic Data



Oksana Belousova

Saint Petersburg State Institute of Technology

Sergey M. Zerkal, Oksana N. Belousova

Section: Mathematical Modeling of Processes and Systems

November 11th, 11:00-16:00, Hall Cabinet

Section Chair: Boris Yu. Lemesenko

1. Numerical Homogenization of the Scalar Electrophysical Properties of the Asphalt Concrete Samples

Daria Dobrolyubova

Trofimuk Institute of Petroleum Geology and
Geophysics of Siberian Branch Russian Academy
of Sciences (IPGG SB RAS)

Daria V. Dobrolyubova, Anastasia Yu. Kutischeva, Sergey I. Markov

2. Numerical Study of the Influence of Random Environmental Factors on the Heat Transfer Processes of Aircrafts

Sergey Gusev

Institute of Computational Mathematics and
Mathematical Geophysics of Siberian Branch of
Russian Academy of Science, Novosibirsk State
Technical University

Sergey A. Gusev, Vladimir N. Nikolaev

3. Mathematical Modeling of the Device for Determining Aircraft Hydraulic System Parameters

Vladimir Nikolaev

FAI «S.A. Chaplygin Siberian Aeronautical
Research Institute»

Sergey A. Gusev, Vladimir N. Nikolaev

4. Application of 3D Airborne Electrical Survey Data Processing in a Distributed Computing System when Solving the Problem of Searching for Polymetallic Ores



Dmitry Kiselev

Novosibirsk State Technical University

Marina G. Persova, Anastasia P. Sivenkova, Yuri G. Soloveichik, Daryana A. Leonovich, Dmitry S. Kiselev, Marina G. Tokareva

5. Numerical Modeling of Eigenfrequencies of Beams with Defects



Anastasiia Kutishcheva

Trofimuk Institute of Petroleum Geology and
Geophysics of Siberian Branch Russian Academy
of Sciences

Anastasiia Yu. Kutishcheva, Mikhail I. Epov

6. Comparative Analysis of the Resolution of Marine Electromagnetic Technologies in the Time and Frequency Domains



Anastasia Sivenkova

Novosibirsk State Technical University

Marina G. Persova, Anastasia P. Sivenkova, Yuri G. Soloveichik, Yulia I. Koshkina, Denis V. Vagin, Marina G. Tokareva

7. Comparative Analysis of Airborne Electrical Prospecting Technologies Using Helicopter Platforms and UAVs When Searching for Kimberlite Pipes



Anastasia Sivenkova

Novosibirsk State Technical University

Yuri G. Soloveichik, Dmitry S. Kiselev, Marina G. Persova, Evgenia I. Simon, Anastasia P. Sivenkova, Daryana A. Leonovich

8. The Problem of Refining Methane Drainage Technology of the Tutuyasskaya Area in Kuzbass, Russia



Arina Smirnova

T.F. Gorbachev Kuzbass State Technical University

Arina D. Smirnova, Shaojie Chen, Tatiana V. Mikhaylova

9. Numerical Simulation of Electrophysical Properties of Asphalt Concrete Samples

Nadezhda Shtabel

Trofimuk Institute of Petroleum Geology and
Geophysics of Siberian Branch Russian Academy
of Sciences (IPGG SB RAS)

Nadezhda V. Shtabel, Ekaterina I. Shtanko, Sergey I. Markov

10. Retrieving Rock Conductivity Model During Well Drilling

Ekaterina Shtanko

Trofimuk Institute of Petroleum Geology and
Geophysics, SBRAS

Ekaterina I. Shtanko, Sergey I. Markov, Anastasiia Yu. Kutishcheva, Nadezhda V. Shtabel, Darya V. Dobrolyubova, Dmitriy A. Arhipov

11. Simulation of One-way Traffic Flow Using the System Dynamics Method



Konstantin Timofeev

Novosibirsk State Technical University

Yuriy V. Shornikov, Konstantin A. Timofeev

12. Mathematical Modeling of the Thermographic Image of the Lower Limbs Varicose Disease in Humans



Egor Tolstoy

Bauman Moscow State Technical University

Larisa V. Zhorina, Egor A. Tolstoy

13. Development of a Breast Mock-up for Thermographic Diagnostics



Egor Tolstoy

Bauman Moscow State Technical University

Larisa V. Zhorina, Flora V. Manucharyan, Egor A. Tolstoy, Andrey N. Plokhikh, Yuri V. Shishkin

**14. Analytical Software Development for Industrial Processes
Management of Oil and Gas Production Using Artificial
Intelligence Technologies**



Dmitriy Egorychev
Moscow State Budget Educational Organization
“School 1501”

Anastasia G. Mukhina, Dmitriy A. Egorychev, Denis A. Volkov

**15. Method for Accelerated Numerical Solution of Nonlinear
Differential Equations**



Maxim Karabutov
Yuri Gagarin State Technical University of Saratov

Vil B. Baiburin, Maxim V. Karabutov

**16. UAVs Electromagnetic Resistance Study under the Powerful
Electromagnetic Pulse Influence**



Rustam Gaynutdinov
Kazan National Research Technical University
named after A. N. Tupolev - KAI

Rustam R. Gaynutdinov, Sergey F. Chermoshentsev

Section: Optical and Laser Technologies

November 10th, 14:00-16:30, Hall Cabinet

Section Chair: Alexander K. Dmitriev,
Dmitry I. Zakrevsky

1. Characteristics of Optical Planar Fiber Luminescent Antennas for Laser Telecommunications

Aleksandr Britvin

Institute of Laser Physics SB RAS

Aleksandr V. Britvin, Nikita S. Nikitenko, Nikolay V. Shahov, Boris V. Poller, Andrey B. Poller

2. Shift and Broadening of Absorption and Dispersion Resonance by Saturation Parameter

Alexander Dmitriev

Novosibirsk State Technical University

Aleksandr P. Karpik, Nikolai N. Golovin, Vyacheslav S. Boldyrev, Alexander K. Dmitriev, Konstantin N. Savinov

3. Herzberger Method Modification

Andrey Golitsyn

Branch of the Institute of Semiconductor Physics,
Siberian Branch of the Russian Academy of
Sciences, "Technological Design Institute of the
Applied Microelectronics"

Andrey V. Golitsyn, Alexandr A. Golitsyn, Natalia A. Seyfi

4. Modernisation of Processes for the Formation of Sight Marks, Scales and Grids Based on the Latest Direct Laser Recording Technology

Nikita Gurin

Institute of Automation and Electrometry of the
Siberian Branch of the Russian Academy of
Sciences (IA&E SB RAS)

Nikita A. Gurin

5. Estimates of the Distortion Contribution From the Reference Sensor to the Calibration Results of the Built-in Angle Sensors

Valerii Kiryanov



Institute of Automation and Electrometry of the
Siberian Branch of the Russian Academy of
Sciences (IA&E SB RAS)

Alexey V. Kiryanov, Valeriy P. Kiryanov

6. Photonic Hook Generated by a Cut Anisotropic Liquid Crystal Microcylinder

Mingyu Zhang



School of Physics Xidian University Xi'an, China

Mingyu Zhang, Renxian Li, Bing Wei, Shuhong Gong, Igor V. Minin, Oleg V. Minin

7. Evaluation of OpenCV- and Laser Pointer- based Vertical Displacement Sensor for Structure Health Monitoring

Artem Mareev

Siberian State University of geosystems and
technologies

*Aleksandr P. Karpik, Aleksandr V. Makeev, Artem V. Mareev, Maxim A. Popkov,
Valentin R. Yangalishev*

8. Peak Intensity at a Nonlinear Focus during Propagation of High-Power Laser Radiation in an Optical Medium

Olga Minina

V.E. Zuev Institute of Atmospheric Optics of
Siberian Branch of the Russian Academy of
Science (IAO SB RAS)

Aleksandr A. Zemlyanov, Olga V. Minina

9. Matching Diode Laser Radiation With Single-Mode Optical Fiber

Konstantin Savinov

Novosibirsk State Technical University

Konstantin N. Savinov, Darya M. Kotina, Leila R. Stolyarova

Section: International Symposium on Knowledge, Ontology, and Theory (KNOTH)

November 10th, 16:00-19:30, Hall Cabinet

Section Chair: Grigoriy R. Khazankin

1. Recognition of Isolated Gestures of the Russian Sign Language Based on the Component Approach

Mikhail Grif

Novosibirsk State Technical University

Mikhail G. Grif, Yana K. Kondratenko

2. Real-Time Russian Sign Language Recognition

Mikhail Khnyunin

Novosibirsk State Technical University

Mikhail V. Khnyunin, Mikhail G. Grif

3. iOk Platform for Automated Object Detection and Analysis in Microscopy Images

Vitalii Kudinov

Novosibirsk State University

Vitalii Yu. Kudinov, Andrey V. Matveev, Natalya N. Sankova, Valerii A. Belotserkovskii, Aleksey G. Okunev, Anna V. Nartova, Mikhail Yu. Mashukov

4. Automating the Transition from Dialectal to Literary Forms in Uzbek Language Texts: an Algorithmic Perspective

Davlatyor Mengliev



Urgench branch of Tashkent University of
Information Technologies named after
Muhammad al-Khwarizmi

Davlatyor B. Mengliev, Dilafriz Hayitbayeva, Vladimir B. Barakhnin, Nilufar Abdurakhmonova

5. Developing Rule-Based and Gazetteer Lists for Named Entity Recognition in Uzbek Language: Geographical Names

Davlatyor Mengliev



Urgench branch of Tashkent University of
Information Technologies named after
Muhammad al-Khwarizmi

*Davlatyor B. Mengliev, Vladimir B. Barakhnin, Mukhammadjon Atakhanov,
Bahodir B. Ibragimov, Mukhriddin Eshkulov, Bobur Saidov*

6. Classification of Borrowers Using an Immune Model of Artificial Intelligence in Credit Scoring Tasks

Anastasia Serikova



Omsk State Technical University

*Alexey E. Sulavko, Anastasia E. Serikova, Georgii A. Suvyrin, Alexander E.
Samotuga, Mariya V. Sorokovaya, Yuriy A. Dorogov*

7. Enhancing the Recommender System Algorithm's Quality Through the Utilization of Affinity Analysis

Igor Stubarev

Novosibirsk State Technical University

Igor M. Stubarev, Olga K. Alsova, Alexander A. Yakimenko

8. An Approach to Classifying Walton's Argumentation Schemes

Elena Sidorova

A.P. Ershov Institute of Informatics Systems

*Irina S. Kononenko, Alexey S. Sery, Vladimir K. Shestakov, Elena A. Sidorova,
Yury A. Zagorulko*

9. Detecting Money Laundering Patterns through Cash Flow Analysis: a Neural Network-Based Approach

Viktor Sushkov



National Research Nuclear University MEPhI

*Pavel Y. Leonov, Viktor M. Sushkov, Valentin A. Romanovsky, Nadezhda V.
Kuznetsova, Nikolay V. Akimov*

10. Factor Analysis-Based Model for Rating the National Financial Security



Viktor Sushkov

National Research Nuclear University MEPhI

Pavel Y. Leonov, Viktor M. Sushkov, Daria Y. Elkina, Denis Pavlov, Sardorbek Yodgorov

11. Self-tuning Hyper-parameters for Unsupervised Cross-lingual Tokenization



Anton Kolonin

Novosibirsk State University

Anton Kolonin

Young Professionals Involvement Competition

November 10th, 14:00-17:00, Hall Terra

Section Chair: Anna S. Kazmina

1. The Process of Primary Frequency Control of the Power Systems Investigation Using Modeling Methods

Viktoriya Fyodorova

Novosibirsk State Technical University

2. Development of Specialized Integrated Circuits for Coordinate X-ray Detectors

Anastasiia Glushak

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

3. Study of Changes in the Electrochemical Parameters of Periodontal Tissues in the Postoperative Period



Andrey Demidov

Penza State University

4. Numerical Modeling of Eigenfrequencies of Beams with Defects



Anastasiia Kutishcheva

Trofimuk Institute of Petroleum Geology and
Geophysics of Siberian Branch Russian
Academy of Sciences

5. Development of a System of Reception and Transmission of Biomedical Signals Based On Ultrasound Technology



Behruz Saidov

South Ural State University

6. Towards Collaborative Coding in RIDE Web IDE

Vladimir Bondarchuk

Institute of Automation and Electrometry of the
Siberian Branch of the RAS

7. Medium-Term Forecast of Water Inflow to the Sayano-Shushenskaya Hydroelectric Power Plant Reservoir by Autoregressive Machine Learning Models

Natalia Cheganova

Novosibirsk State Technical University

8. MMIC GaAs Power Limiter on 30 GHz with a Small Flat Leakage Power

Alexander Grusha

JSC "RPC "Istok" named after Shokin"

9. Developing a Pulse Wave Model Using the Lumped Element Method



Viktor Karnaukhov

Penza state university

10. Investigation of the Influence of Heterostructure on the Parameters of Microwave Transistors



Alexandr Shesterikov

AO «NPF «Micran»

11. Generator and Oscilloscope Method

Aleksey Bakulin

Federal State Unitary Enterprise «VNIIFTRI»

12. Thermal Analysis of 3D Heterogeneous Integration for Microwave HEMTs

Alexander Efimov

"Istok" named after Shokin"

13. Investigation of the Phase Composition and Structural Parameters of Aluminum Nitride Thin Films Obtained by Magnetron Sputtering



Larisa Baranova

Omsk State University named after F.M. Dostoevsky; Institute of Radiophysics and Physical Electronics of Omsk Scientific Center

14. Modeling of Methylated DNA Determination by Means of Ultrashort Laser Pulses



Anastasya Kharlamova

Federal State Autonomous Educational Institution of Higher Education «Northern (Arctic) Federal University named after M.V. Lomonosov»

