International Conference Program

«2023 Systems of Signal Synchronization, Generating and Processing in Telecommunications SYNCHROINFO-2023»

IEEE Conference Record #57872

29 – 30 June, 2023

Pskov, Russia, Verhnee-Beregovaya, 4
Hotel "Old Estate"

TECHNICAL PROGRAM COMMITTEE

Chairman of the Program Committee

Alexander V. Pestryakov: Doctor of Science (Engineering), Professor of Moscow Technical University of Communications and Informatics, Moscow, Russia

Vice-Chairman of the Program Committee
Oleg V. Varlamov: Doctor of Technical Sciences, Professor, Chairman of the Institute of Radio and Information Systems Association (IRIS), Senior Member, IEEE

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Conference Publication Program Coordinator

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Anna V. Dolgopyatova: M.Sc., Moscow Technical University of Communications and Informatics, Moscow, Russia

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César Herman Castellanos Dominguez: Ph.D., National University of Colombia

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Victor N. Kochemasov: Ph.D, General Director of LLC Radiocomp, Member, IEEE

Andrei V. Grebennikov: Ph.D., Sumitomo Electric Europe, UK, Senior Member, IEEE

Oleg G. Morozov: Doctor of Technical Sciences, Professor, Head of the Department of Radiophotonics and Microwave Technologies of KNRTU-KAI, Senior Member, IEEE

Artem S. Adzhemov: Doctor of Technical Sciences, Professor, Member, IEEE

CONFERENCE REGULATIONS

June 28

Participants meeting & Excursion program (*Экскурсионная программа*)

11:00 – 18:30

June 29

10:30 – 11:00
REGISTRATION OF PARTICIPANTS

11:00 – 12:40
PLENARY SESSION (*Конференц-зал*)

12:40 – 12:50
PHOTOGRAPHING (*Конференц-зал*)

12:50 – 14:00
DINNER

SECTION MEETINGS*

14:00 – 18:00 Sections 1 and 5 (*Малый зал*)

14:00 – 18:00 Section 3, Part I (*Конференц-зал*)

19:00 – 22:00
CONFERENCE BANQUET (*Ресторан отеля «Old Estate»*)

June 30

SECTION MEETINGS*

10:00 – 15:45 Section 3, Part II (*Конференц-зал*)

11:00 – 14:00 Section 2 (*Малый зал*)

14:00 – 17:00 Section 4 (*Малый зал*)

*Время выступления 15 минут (включая вопросы участников
в завершении каждой секции запланировано время на дискуссию

PLENARY SESSION

11-00 : 11-15
SYNCHRONIZATION. RESULTS OF 50 YEARS DEVELOPMENT IN THE USSR AND RUSSIA
A.V. Pestryakov, *Chairman of the Organizing Committee, Doctor of Science (Engineering), Professor, Moscow Technical University of Communications and Informatics, Moscow, Russia*

11-15 : 11-30
FROM SCIENTIFIC REPORT TO INDUSTRIAL DEVELOPMENT
A.V. Dolgopyatova, *Secretary of the technical program committee***,** *Moscow Technical University of Communications and Informatics, Moscow, Russia*
S.S. Dymkova, *Conference Publication Program Coordinator, Member, IEEE*
O.V. Varlamov, *Moscow Technical University of Communications and Informatics, Moscow, Russia, Senior Member, IEEE*

11-30 : 11-50
THE MEASURING PROBES FRAMEWORK SYNCHRONIZING FOR THE DIGITAL METROLOGY
Sergei Melnik,
Moscow Technical University of Communications and Informatics, Moscow, Russia
Elena Petrova, *Joint Stock Company TC DT, Moscow, Russia*
Vasily Vikulin, *Joint Stock Company KIA, Moscow, Russia*

11-50 : 12-10
DEVELOPMENT OF METHODS FOR AUTOMATIC PROCESSING OF THE INTERFERENCE SPECTRUM IN THE HF BAND FOR THE PROBLEM OF ASSESSING THE AVAILABILITY OF RADIO CHANNELS
V.A. Ivanov, D.V. Ivanov, *Member IEEE***, N.V. Ryabova** *Member IEEE***,**
R.R. Belgibaev, *Volga State University of Technology, Yoshkar-Ola, Russia*

12-10 : 12-30
ANALYSIS OF HIGH-ORDER ALIASING IN BANDPASS SUB-NYQUIST SAMPLING
Vladislav Lesnikov, *Member IEEE***, Tatiana Naumovich,**
Alexander Chastikov, Dmitriy Dubovcev, *Vyatka State University, Kirov, Russia*

12-30 : 12-40
IEEE PUBLICATION SPECIFIC REQUIREMENTS
O.V. Varlamov, *Moscow Technical University of Communications and Informatics, Moscow, Russia, Senior Member, IEEE*

SECTION 1
Synchronization Systems and Devices
&
SECTION 5
Photonics and mathematics for moving objects

SECTION CO-CHAIRS
Sergey S. Shavrin, *Doctor of Science (Engineering), Professor,*
Moscow Technical University of Communications and Informatics, Moscow, Russia

Marina Yashina, *Member, IEEE, Doctor of Science (Engineering), Professor,*
Moscow Automobile and Road Construction State Technical University (MADI), Moscow,
Russia

14:00 – 18:00

Boris B. Borisenko, Sergey D. Erokhin, Ivan D. Martishin
Moscow Technical University of Communications and Informatics, Moscow, Russia
**ANALYSIS OF MACHINE LEARNING METHODS FOR DETECTING
COMPUTER ATTACKS**

Mikhail Gorodnichev
Moscow Technical University of Communications and Informatics, Moscow, Russia
**ON THE APPLICABILITY OF REINFORCED LEARNING IN THE ROUTE
SELECTION TASK OF AN UNMANNED VEHICLE**

V.A. Drogovoz
*Federal Research Center "Computer Science and Control" of the Russian Academy of
Sciences, Moscow, Russia*
A.N. Kubankov
Moscow Technical University of Communications and Informatics, Moscow, Russia
**CONCEPTUAL ASPECTS OF INTEROPERABILITY CONTROL
FOR IMPROVING SYNCHRONIZATION PROCESSES
IN CLOUD COMPUTING**

Sergey D. Erokhin, Boris B. Borisenko, Aleksander S. Fadeev
Moscow Technical University of Communications and Informatics, Moscow, Russia
**ANALYSIS AND DEVELOPMENT OF GAME-THEORETIC MODELS FOR
COMBATING THREATS TO INFORMATION SECURITY
IN CRITICAL INFORMATION INFRASTRUCTURE**

L.N. Isaeva, A.A. Nemykin, A.V. Lobzov
Moscow Technical University of Communications and Informatics, Moscow, Russia
S.S. Kogan
LLC «T8», St-Peterburg, Russia
GLONASS APPLICATION FOR SYNCHRONIZATION 4G/5G MOBILE NETWORKS AND RADIO SIGNALS MEASURING INSTRUMENTS

Tatyana A. Kuzovkova, Olga I. Sharavova
Moscow Technical University of Communications and Informatics, Moscow, Russia
Valery O. Tikhvinskiy
Radio Research and Development Institute, Moscow, Russia;
The International Information Technology University (IITU), Almaty, Kazakhstan
Evgeny E. Devyatkin
Radio Research and Development Institute, Moscow, Russia
EXAMINING THE IMPACT OF STRATEGIC TRENDS ON RADIO FREQUENCY SPECTRUM REQUIREMENTS IN MOBILE COMMUNICATION SYSTEM

E. K. Melkova, V. M. Korovushkina, A. V. Shvedov, D. V. Gadasin
Moscow Technical University of Communications and Informatics, Moscow, Russia
CLUSTER IMPLEMENTATION BASED ON THE BELONGING FUNCTION

Ilia Peshkov
Bunin Yelets State University, Yelets, Russia
AN APPROACH FOR DESIGNING A TWO-ELEMENT ANTENNA ARRAY FOR ESTIMATING THE SPATIAL COORDINATES OF RADIO SIGNALS WITH INCREASED ACCURACY

Pavel L. Pilyugin, Sergey D. Erokhin, Andrey N. Petukhov
Moscow Technical University of Communications and Informatics, Moscow, Russia
Sergey P. Litvinyuk
Lomonosov Moscow State University, Moscow, Russia
GLOBAL FLOWS SECURITY POLICY FOR TECHNOLOGICALLY ISOLATED NETWORKS AND CRITICAL INFRASTRUCTURES

Anatoliy V. Ryzhkov, Mikhail L. Schwartz, Vladimir M. Aladin
Moscow Technical University of Communications and Informatics, Moscow, Russia
MAINTAINING THE TIMELINE RELIABILITY IN THE MASTER NETWORK CLOCK IN CONDITIONS OF DELIBERATE INTERFERENCE

Mikhail L. Schwartz, Vladimir M. Aladin, Anatoliy V. Ryzhkov
Moscow Technical University of Communications and Informatics, Moscow, Russia
FEATURES OF TIME ERROR MEASUREMENTS IN TIME SCALE SYNCHRONIZATION SYSTEM

Grigoriy Fokin, Konstantin Ryutin
The Bonch-Bruevich SPbSUT, Saint Petersburg, Russia
Vladimir Grigoriev, Vadim Bobrovskiy
Limited Liability Company, "Laboratory of Infocommunication Networks", Saint Petersburg, Russia
SOFTWARE-DEFINED RADIO NETWORK POSITIONING TECHNOLOGY DESIGN. SYNCHRONIZATION SUBSYSTEM

Sergey S. Shavrin, Tatyana G. Lavrentyeva, Olga Y. Musatova, Natalia E. Kalabekyanc
Moscow Technical University of Communications and Informatics, Moscow, Russia
Andrey B. Semenov
NRU MGSU, Moscow, Russia
ADS-B CYBERSECURITY AND AUTONOMY – A-NETWORK

Andrey M. Valuev
Mechanical Engineering Research Institute named after A.A.Blagonravov of RAS, Moscow, Russia
MICRO-LEVEL MODEL OF TRAFFIC AT THE INTERSECTION WITH DISCRETE-CONTINUOUS CHOICE OF DRIVER CONTROL

Andrey V. Laushkin, Anatoly A. Udalov, Maria V. Vologina, Natalia A. Adasinskaya
Moscow Automobile and Road Construction State Technical University (MADI), Moscow, Russia
Marina V. Yashina, *Member IEEE*
Moscow Automobile and Road Construction State Technical University (MADI), Moscow, Russia;
Moscow Technical University of Communications and Informatics, Moscow, Russia;
Moscow Aviation Institute (National Research University MAI), Moscow, Russia
STRUCTURING OF THE MAIN MEASUREMENT ZONES OF ACOUSTIC TRACKS FOR DIAGNOSE OF THE INTERNAL COMBUSTION ENGINE COMPONENTS

Marina V. Yashina, *Member IEEE*

Moscow Automobile and Road Construction State Technical University (MADI), Moscow, Russia;

Moscow Technical University of Communications and Informatics, Moscow, Russia;

Moscow Aviation Institute (National Research University MAI), Moscow, Russia

Sergey A. Biruykov, Roman V. Strekalov

Moscow Automobile and Road Construction State Technical University (MADI), Moscow, Russia

VELOCITY SPECTRA OF ELEMENTARY BIDIRECTIONAL TRAFFIC MODEL AS BUSLAEV-TYPE NET

Phan Tuan Anh, V. V. Logvinov

Moscow Technical University of Communications and Informatics, Moscow, Russia

ANALYSIS OF THE SYNCHRONOUS AMPLIFIER PROPERTIES USING MATLAB AND SIMULATION IN MICROCAP ENVIRONMENT

O.V. Biryukova, I.V. Koretskaya

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

DISTANCE AND SPEED CONTROL CAPABILITIES TO CONTROL THE PROCESS OF COLLECTING INFORMATION IN THE CONTROL AND MEASURING EQUIPMENT

DISCUSSION & QUESTIONS

SECTION 3 (PART I)
Signal Processing Devices

CHAIR OF SECTION 3 (PART I)

Artem S. Adzhemov, *Doctor of Science (Engineering)*, *Professor, Moscow Technical University of Communications and Informatics, Moscow, Russia, Member IEEE*

14:00 – 18:00

S.A. Adzhemov, A.Y. Kudryashova
Moscow Technical University of Communications and Informatics, Moscow, Russia
CONSTRUCTION OF THE PRIMARY CODE WITH THE SPECIFIED CODE DISTANCES BETWEEN ADJACENT CODE COMBINATIONS

A.S. Adzhemov, S.A. Adzhemov, A.Y. Kudryashova
Moscow Technical University of Communications and Informatics, Moscow, Russia
METHODS OF COMPARISON OF CODE COMBINATIONS WITH MESSAGE ELEMENTS FROM THE SOURCE

Alaa Ali, Evgenii M. Lobov
Moscow Technical University of Communications and Informatics, Moscow, Russia
DEVELOPING AND BUILDING AN INTELLIGENT INTER-SYMBOL INTERFERENCE REDUCTION SYSTEM USING DEEP LEARNING TECHNIQUES

Mikhail Bakulin, Taoufik Ben Rejeb, Vitaly Kreyndelin, Denis Pankratov, Aleksei Smirnov
Moscow Technical University of Communications and Informatics, Moscow, Russia
ANALYSIS OF THE MU-MIMO SYSTEM FROM THE PERSPECTIVE OF ORTHOGONAL AND NON-ORTHOGONAL ACCESS

Sofien Ben Rejeb, Vitaly Kreyndelin
Moscow Technical University of Communications and Informatics, Moscow, Russia
STUDY OF INTERFERENCE IMMUNITY OF MMSE, ZF, AND ML DEMODULATION ALGORITHMS IN MIMO SYSTEMS UNDER HIGH-ORDER MODULATION

N.A. Kandaurov, V. I. Lipatkin, E.O. Kandaurova, V.O. Varlamov
Moscow Technical University of Communications and Informatics, Moscow, Russia
IMPLEMENTATION OF M-CPFSK SIGNAL RECEPTION USING
ARM PROCESSOR WITH GPU AND SDR RECEIVER

E.O. Kandaurova, D.S. Chirov
Moscow Technical University of Communications and Informatics, Moscow, Russia
NEURAL NETWORK ALGORITHM FOR PREDICTING SPECTRUM
OCCUPANCY IN COGNITIVE RADIO SYSTEMS

Sergey V. Kozlov
Federal Research Center "Computer Science and Control" Russian Academy of Sciences, Moscow, Russia
Alexander N. Kubankov
Moscow Technical University of Communications and Informatics, Moscow, Russia
SYSTEMATIZATION AND SYNCHRONIZATION OF TARGET PROCESSES IN
ORGANIZATIONAL SYSTEMS

Anvar N. Khairullin, Ilya M. Lerner, R.R. Fayzullin, Yazilya F. Ziatdinova
Kazan National Research Technical University n.a. A.N. Tupoleva – KAI, Kazan, Russia
V. I. Il'in
Kazan Federal University, Kazan, Russia
PAM-N-SIGNAL SHAPING UTILIZING RESOLUTION TIME

DISCUSSION & QUESTIONS

SECTION 3 (PART II)
Signal Processing Devices

CHAIR OF SECTION 3 (PART II)

Denis S. Chirov, *Doctor of Science (Engineering)*, *Professor, Moscow Technical University of Communications and Informatics, Moscow, Russia*

10-00 : 15-45

Ali M. Almufti, *Member IEEE*, **O. G. Morozov,** *Senior Member IEEE*
Kazan National Research Technical University n.a. A.N. Tupolev-KAI, Kazan, Russia
1TBIT/S PER LAMBDA HIGH ORDER QUADRATURE AMPLITUDE MODULATION (128-256QAM) COHERENT OPTICAL TRANSMISSION SYSTEM DESIGN TO SUPPORT (5G+)

Vladimir Khryashchev, *Member IEEE*, **Anton Lebedev,**
Andrey Priorov, Nikita Kotov
P.G. Demidov Yaroslavl State University, Yaroslavl, Russia
Dmitriy Zavyalov
Yaroslavl State Medical University, Yaroslavl, Russia
DEEP LEARNING ARCHITECTURE FOR REAL-TIME POLYPS DETECTION ON ENDOSCOPIC VIDEO

V.B. Kreyndelin, E.D. Grigorieva
Moscow Technical University of Communications and Informatics, Moscow, Russia
REDUCED COMPUTATIONAL COMPLEXITY OF MINIMUM MEAN SQUARED ERROR DEMODULATION ALGORITHM WITHOUT PERFORMANCE LOSS

E.A. Liberman, V.I. Lipatkin, D.N. Shubin, A.Yu. Lychagin
Moscow Technical University of Communications and Informatics, Moscow, Russia
DEVELOPMENT OF A STAND FOR RESEARCH THE EUROBALISE COMMUNICATION PROTOCOL OF THE ETCS SYSTEM AT THE PHYSICAL LAYER

Nikita Yu. Liberovskiy, Kirill Yu. Sokolov, Vladimir S. Priputin
Moscow Technical University of Communications and Informatics, Moscow, Russia
SOLVING PERMUTATION PROBLEM IN THE TASK OF BLIND SEPARATION OF TWO COMPLEX SIGNALS

E.M. Lobov, E.O. Lobova, V.I. Lipatkin, N.E. Poborchaya
Moscow Technical University of Communications and Informatics, Moscow, Russia
OPTIMAL DETECTION OF HF RADIOLINKS BROADBAND SIGNAL WITH
JOINT AMPLITUDE, PHASE, AND DISPERSION DISTORTION VALUE
ESTIMATION

E.O. Lobova, V.O. Varlamov, E. M. Lobov
Moscow Technical University of Communications and Informatics, Moscow, Russia
COMPARISON OF OPTIMAL FILTERING ALGORITHMS OF THE CHANNEL
DISPERSION SLOPE AND THE SIGNAL PHASE SHIFT

V.Y. Mikhaylov, R.B. Mazepa, O.V. Vakulchik
Moscow Aviation Institute (National Research University), Moscow, Russia
REMOTE MONITORING OF EVENTS THAT CAUSE A DECREASE
IN THE PERFORMANCE OF INFORMATION SEARCH SYSTEMS

Victor Mikhailov
JSC MERI, Moscow, Zelenograd, Russia
Anastasia Semenova, Elena Omelyanchuk
National Research University of Electronic Technology, Moscow, Zelenograd, Russia
Kotlyarov Evgeny
JSC MERI;
National Research University of Electronic Technology, Moscow, Zelenograd, Russia
EVALUATION OF THE APPLICABILITY OF EMPIRICAL MODELS
OF INDOOR RADIO WAVE PROPAGATION FOR THE INTERNET
OF THINGS

O.G. Morozov, *Member IEEE***, Ali M. Almufti,** *Member IEEE*
Kazan National Research Technical University n.a. A.N. Tupolev-KAI, Kazan, Russia
SIMULATION WITH INVESTIGATION FOR 16TBIT/S HIGH ORDER
QUADRATURE AMPLITUDE MODULATION DUAL POLARIZATION
COHERENT OPTICAL TRANSMISSION SYSTEM FOR 5G AND BEYOND

Bogdan E. Nazarenko, Tatiana K. Artemova
P.G. Demidov Yaroslavl State University, Yaroslavl, Russia
STUDY OF THE LINEAR ANTENNA ARRAYS BENDING INFLUENCE ON THE
ELEMENTS MUTUAL COUPLING

N. E. Poborchaya, E.O. Lobova
Moscow Technical University of Communications and Informatics, Moscow, Russia
SYNTHESIS OF A NON-RECURRENT REGULARAZING ALGORITHM OF M-
QAM SIGNAL DETECTION IN MIMO

Michael A. Pogudin, Elena V. Medvedeva
Vyatka State University, Kirov, Russia
**IMPROVING THE ACCURACY OF DETECTING TEXTURE AREAS
IN MULTI-CHANNEL IMAGES WITH NOISE**

O. B. Popov, T. V. Chernysheva, P. S. Sapronov; A. V. Abramov
Moscow Technical University of Communications and Informatics, Moscow, Russia
OBJECTIVE EVALUATION OF AUDIO BROADCAST SIGNAL QUALITY

Natalya Ryabova, *Member IEEE,* **Vladimir Ivanov,**
Dmitry Ivanov, *Member IEEE*, **Aleksey Elsukov**
Volga State University of Technology, Yoshkar-Ola, Russia
**ESTIMATING THE OCCUPANCY OF IONOSPHERIC HF CHANNELS FOR
OPERATION OF THE INTERMODE TIME-FREQUENCY DISPERSION SENSOR
WITH MINIMUM POWER**

A.N. Sak
Moscow state university of civil engineering, Moscow, Russia
PARSING A SENTENCE USING CLUSTERING ALGORITHMS

Vladimir V. Shestakov, Irina V. Manonina
Moscow Technical University of Communications and Informatics, Moscow, Russia
**MATHEMATICAL MODEL OF THE ERROR SOURCE
OF RADIO CHANNELS WITH RAYLEIGH FADING**

K.Y. Sokolov, V.S. Priputin, I. A. Volkov
Moscow Technical University of Communications and Informatics, Moscow, Russia
**ON BLIND SOURCE SEPARATION METHOD IN THE SPATIAL
POLARIZATION SELECTION PROBLEM**

V.O. Varlamov, N.A. Kandaurov, N.Y. Liberovskiy, E.O. Kandaurova
Moscow Technical University of Communications and Informatics, Moscow, Russia
**INVESTIGATION OF LORA BASED SIGNAL CODE CONSTRUCTIONS NOISE
IMMUNITY**

I. A. Volkov, K. Y. Sokolov, V. S. Priputin
Moscow Technical University of Communications and Informatics, Moscow, Russia
**BLIND SOURCE SEPARATION MODEL RESEARCH BASED ON COMPLETE
ENSAMBLE EMPIRICAL MODE DECOMPOSITION
WITH ASSISTANT NOISE**

V.S. Moskvin
ITMO, St. Petersburg, Russia
APPLICATION OF QUANTUM WALK FOR SIGNAL PROCESSING

O. A. Mukhametzyanov

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

NEW PARAMETER TO DETECT LOW-AMPLITUDE HIGH-FREQUENCY ELEMENTS IN HEART SIGNALS

DISCUSSION & QUESTIONS

SECTION 2
Signal Generating and Shaping Devices

SECTION CHAIR

Oleg V. Varlamov, *Doctor of Technical Sciences, Professor, Moscow Technical University of Communications and Informatics, Moscow, Russia, Senior Member, IEEE,*

11:00 – 14:00

E.Y. Bushuev
Moscow Technical University of Communications and Informatics, Moscow, Russia
COMPARATIVE ANALYSIS OF QUANTUM KEY DISTRIBUTION SCHEMES IN QUANTUM COMMUNICATION CHANNEL AND QUANTUM KEY DISTRIBUTION PROCESS SIMULATION

D.V. Gadasin, K.A. Panteleeva, A.V. Shvedov, V.V. Maklachkova
Moscow Technical University of Communications and Informatics, Moscow, Russia
USING FORMANTS FOR HUMAN SPEECH RECOGNITION BY ARTIFICIAL INTELLIGENCE

Lolai Husenzoda
International University of Tourism and Entrepreneurship of Tajikistan, Dushanbe, Tajikistan
Khusen K. Begimov
Tajik State Pedagogical University named after Sadriddin Aini, Dushanbe, Tajikistan
Aziza H. Khudoyarova, Sharifjon F. Shoev
Tajik National University, Dushanbe, Tajikistan
Dilshod C. Ravshanov, *Member IEEE*
Tajik Technical University named after academician M.S. Osimi, Dushanbe, Tajikistan
DESIGN OF DIRECTIONAL COUPLERS, TAKING INTO ACCOUNT THE DIFFERENT PERMITTIVITY OF THE BOARD

Aleksey A. Kislitsin, Nikita A. Konkin, Natalya V. Ryabova, *Member IEEE*
Volga State University of Technology, Yoshkar-Ola, Russian
THE STUDY OF MACHINE LEARNING FEATURES TO ANALYZE THE ACCURACY OF PREDICTION OF THE COHERENCE BAND OF GLONASS REFERENCE STATIONS

D.V. Kochemasov, *Radiocomp, LLC, Moscow, Russia*
N.N. Udalov, *National Reaseach University MPEI, Moscow, Russia*
ANALYSIS OF STABILITY STATIONARY MODES OF QUADRATURE VOLTAGE CONTROLLED OSCILLATIONS WITH MUTUAL SYNCHRONIZATION

Vladimir Sannikov, Valery Volchkov
Moscow Technical University of Communications and Informatics, Moscow, Russia
INCREASE THE SPECTRAL EFFICIENCY OF A MULTI-FREQUENCY MODEM DUE TO NON-ORTHOGONAL COMPACTION OF OPTIMAL NARROWBAND QAM SIGNALS

Elena P. Stroganova
Moscow Technical University of Communications and Informatics, Moscow, Russia
HYBRID VERIFICATION OF RADIO ELECTRONIC AND TELECOMMUNICATION EQUIPMENT

Valery P. Volchkov, Vladimir G. Sannikov
Moscow Technical University of Communications and Informatics, Moscow, Russia
MODIFIED PRONY METHOD WITH AMPLITUDE-PHASE CORRECTION

S. A. Nenashev, V. A. Nenashev
Saint-Petersburg State University of Aerospace Instrumentation, Saint-Petersburg, Russia
SEARCH MARKED CODE STRUCTURES FOR A SPATIALLY DISTRIBUTED SYSTEM OF SMALL-SIZED AIRBORNE RADARS

Khusen K. Begimov
Tajik State Pedagogical University named after Sadriddin Aini, Dushanbe, Tajikistan
Lolai Husenzoda
International University of Tourism and Entrepreneurship of Tajikistan, Dushanbe, Tajikistan
Dilshod C. Ravshanov, *Member IEEE*, **Faridun B. Holov**
Tajik Technical University named after academician M.S. Osimi, Dushanbe, Tajikistan
Aziza H. Khudoyarova
Tajik National University, Dushanbe, Tajikistan
CALCULATION AND ANALYSIS OF A POWER DIVIDER WITH REDUCED WEIGHT AND SIZE PARAMETERS DEPENDING ON THE NUMBER OF CONNECTED CELLS

S.E. Grychkin, A.M. Zakharov, O.V. Varlamov, *Senior Member IEEE*
Moscow Technical University of Communications and Informatics, Moscow, Russia
CALCULATION AND SIMULATION OF GAN FET MODULATOR FOR ENVELOPE ELIMINATION AND RESTORATION POWER AMPLIFIER

DISCUSSION & QUESTIONS

SECTION 4

«Problems of microwave electronics»
them. V.A. Solntsev

SECTION CHAIR

Andrey A. Yelizarov, *Doctor of Science (Engineering), Professor, National Research University Higher School of Economics, Moscow, Russia, Senior Member IEEE,*

14:00 – 17:00

A.P. Kuchina, E.A. Zakirova
HSE University, Moscow, Russia
ELECTRODYNAMIC MODEL OF CONICAL HORN ANTENNA RADIATION FIELDS FOR PURPOSES OF ELECTROMAGNETIC SAFETY

I.R. Lavrukhin, A.A. Yelizarov, *Senior Member IEEE***, S.V. Bashkevich**
National Research University Higher School of Economics, Moscow, Russia
RESEARCH OF OPTIMUM FIELD DISTRIBUTION ON A CYLINDER

M.A. Mashkova, V.N. Karavashkina
Moscow Technical University of Communications and Informatics, Moscow, Russia
A.A. Yelizarov, *Senior Member IEEE*
Moscow Technical University of Communications and Informatics, Moscow, Russia;
National Research University "Higher School of Economics", Moscow, Russia
A.A. Skuridin, I.V. Nazarov
National Research University "Higher School of Economics", Moscow, Russia
MODELING OF A WAVEGUIDE POLARIZER WITH A WEDGE-SHAPED MAGNETIC WALL

S.A. Presnyakov, A.D. Kasatkin, N.P. Kravchenko
HSE University, Moscow, Russia
INVESTIGATION OF ELECTRODYNAMIC CHARACTERISTICS OF THE MILLIMETER RANGE FOLDED WAVEGUIDE SLOW-WAVE STRUCTURE

Anatoliy Yu. Perlov
National Research University of Electronic Technologies, Moscow, Russia
Alexander V. Timoshenko, *Member IEEE, Moscow Aviation Institute, Moscow, Russia*
Valeriy Y. Prorok, *A.F. Mozhaysky's Military-Space Academy, Saint Petersburg, Russia*
Vladimir S. Bugayev
Scientific and Research Institute for Long-Distance Radio Communications, Moscow, Russia
Lvov K.V., *Lomonosov Moscow State University, Moscow, Russia*
PREDICTING OF RADAR FAILURE BASED ON THE OPERATOR FUNCTIONAL STATE

Alexander V. Timoshenko, *Member IEEE,*
Moscow Aviation Institute, Moscow, Russia
Anatoly Yu. Perlov
National Research University of Electronic Technologies, Moscow, Russia
Roman S. Shafir, Kirill V. Lvov
Lomonosov Moscow State University, Moscow, Russia
MODELING OF THERMAL PROCESSES IN MULTICHANNEL RADARS IN HEAT-STRESSED OPERATION MODES

A.A. Yelizarov, *Member IEEE,* **D.M. Ikonnikova, A.I. Katsnelson, D.S. Ilyanova**
National Research University «Higher School of Economics», Moscow, Russia
O.V. Arinin
Moscow Technical University of Communications and Informatics, Moscow, Russia
INTELLIGENT SYSTEM FOR WIRELESS TRANSMISSION OF RF-ENERGY FOR MOBILE IOT DEVICES

DISCUSSION & QUESTIONS