

**International Conference Program**

**«2022 Systems of Signal Synchronization,  
Generating and Processing in  
Telecommunications  
SYNCHROINFO-2022»**

**IEEE Conference Record #55067**

**June 29 – July 01, 2022**

**Arkhangelsk, Russia, Severnaya Dvina Embankment, 88, build. 1  
Pur-Navolok Hotel**

## **ORGANIZERS**

Institute of Electrical and Electronics Engineers (IEEE)  
Russia Section ED/MTT/AES Joint Chapter  
Institute of Radio and Information Systems (IRIS)

## **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)

### ***Program Committee Coordinator***

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### ***Conference Publication Program Coordinator***

**Svetlana S. Dymkova:** Chair of Russia Section TEM/GRS/ITSS Jt. Chapter, (Member, IEEE)

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

### ***Members of the program committee***

**Timofey Ya. Shevgunov:** PhD., Chair of Russia Section ED/MTT/AES Joint Chapter, (Senior Member, IEEE)

**Alexander V. Chenakin:** Doctor of Technical Sciences, Director of R & D, Anritsu Company, Morgan Hill, CA (Senior Member, IEEE)

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

**Denis S. Chirov:** Doctor of Technical Sciences, Professor (Member, IEEE)

**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**

**PRE-PARTY with welcome drink** (*Зал переговоров «Pur-Navolok»*)

**20:00 – 21:00**

**June 29**

**09:45 – 10:00**

**REGISTRATION OF PARTICIPANTS**

**10:00 – 12:50**

**PLENARY SESSION & SECTION I** (*Конференц-зал «Pur-Navolok»*)

**12:50 – 13:00**

**PHOTOGRAPHING** (*Конференц-зал «Pur-Navolok»*)

**13:00 – 14:00**

**Обед\***

**SECTION MEETINGS** (*Малый зал*)

**14:00 – 16:00 Section 1 (Part II)**

**16:00 – 18:36 Section 2**

**19:00 – 22:00**

**DINNER** (*Ресторан отеля «Pur-Navolok»*)

**June 30**

**SECTION MEETINGS** (*Малый зал*)

**10:00 – 11:48 Section 4**

**11:48 – 13:48 Section 5**

**14:00 – 20:00 Section 3**

**July 1**

**Excursion program** (*Экскурсионная программа*)

*\*Комплексный обед можно заказать за день на ресепшене отеля*

**JUNE 29**

**PLENARY SESSION & SECTION 1 (PART I)**

**SECTION CHAIR**

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

**10-00 : 10-05**

**FOREWORD**

**A.V. Pestryakov**, *Chairman of the Organizing Committee, Moscow, Russia*

**10-05 : 10-20**

**S.S. Dymkova**, *Conference Publication Program Coordinator (Member, IEEE)*

**O.V. Varlamov**, *Senior Member IEEE*

**PEER REVIEW PROCEDURE AS THE MAIN CRITERION FOR  
CONFIRMATION RESEARCHER'S SCIENTIFIC WORK QUALITY**

**10-20 : 10-35**

**V.B. Kreyndelin, E.D. Grigorieva**

*Moscow Technical University of Telecommunications and Informatics, Moscow, Russia*

**AN ANALYSIS OF COMPUTATIONAL COMPLEXITY OF VARIOUS  
IMPLEMENTATION TECHNIQUES OF MMSE DEMODULATION  
ALGORITHM**

**10-35 : 10-50**

**Sergei Melnik**

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

**Vasily Vikulin**, *LTD KIA, CEO, Moscow, Russia*

**Vladimir Babkin**, *MTS, Moscow, Russia*

**Elena Petrova**, *JSC STC KOMTEST, Moscow, Russia*

**TIME AND FREQUENCY SYNCHRONIZATION FOR INTERNET  
SERVICE PROVIDER NETWORKS DATA RATES DETERMINATION**

**10-50 : 11-05**

**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*

**MATCHING OF 6G NETWORK CAPABILITIES TO DIGITAL SERVICES  
REQUIREMENTS**

**11-05 : 11-20**

**Anatoliy V. Ryzhkov, Vladimir M. Aladin, Mikhail L. Schwartz**

*Moscow Technical University of Telecommunications and Informatics, Moscow, Russia*

**Andrey V. Isupov, Komset-Service Ltd., Moscow, Russia**

**EXPERIENCE IN THE DEVELOPMENT AND IMPLEMENTATION OF TIME-FREQUENCY SYNCHRONIZATION SYSTEMS ON TELECOMMUNICATIONS**

**11-20 : 11-35**

**Michael Vekselman, MaxNavi LLC, Moscow, Russia**

**SECURITY OF GNSS-BASED SYNCHRONIZATION SYSTEMS.**

**Monitoring the quality of navigation systems**

**11-35 : 11-50**

**Mikhail L. Schwartz, Vladimir M. Aladin, Anatoliy V. Ryzhkov**

*Moscow Technical University of communications and Informatics, Moscow, Russia*

**PERSPECTIVE EQUIPMENT OF PRIMARY REFERENCE TIME AND CLOCK FOR SYNCHRONIZATION SYSTEMS**

**11-50 : 12-05**

**S.V. Pavlov, V.V. Maklachkova, V.A. Dokuchaev**

*Moscow Technical University of Telecommunications and Informatics, Moscow, Russia*

**IMPROVING THE STABILITY OF SATELLITE SYNCHRONIZATION OF SINGLE-FREQUENCY TELEVISION TRANSMITTERS UNDER THE INFLUENCE OF INTERFERENCE**

**12-05 : 12-20**

**M.I. Zhodzishsky, F.B. Serkin**

*Moscow Aviation Institute (National Research University);*

*Topcon Positioning Systems, Moscow, Russia*

**R.V. Kurynin, HSE University; Topcon Positioning Systems, Moscow, Russia**

**SENSITIVITY OF GNSS RECEIVERS**

**12-20 : 12-35**

**O.A. Shorin, V.O. Shorin**

*Moscow Technical University of Telecommunications and Informatics, Moscow, Russia*

**G.O. Bokk, OJSC NIRIT-XINWEI Telecom Technology (NXTT), Moscow, Russia**

**IMPROVED FBMC (5G) SIGNAL STRUCTURES FOR CRITICAL COMMUNICATIONS SYSTEMS**

**Increase of noise immunity in conditions of multipath propagation**

**12-35 : 12-50**

**Alexander V. Pestryakov**

*Moscow Technical University of Telecommunications and Informatics, Moscow, Russia*

**HYBRID SYSTEM OF MOVING OBJECTS GLOBAL MONITORING**

**JUNE 29**

**SECTION 1 (PART II)**  
**Synchronization Systems and Devices**

**SECTION CHAIR**

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

**14-12 : 14-24**

**V.L. Karyakin** (*Member IEEE*)

*Volga region state university of telecommunications and informatics, Samara, Russia*

**ANALYSIS OF TECHNICAL REQUIREMENTS FOR DVB-T2 NETWORK EQUIPMENT**

**14-24 : 14-36**

**Daniyar R. Mukhametov**

*Financial University under the Government of the Russian Federation, Moscow, Russia*

**HOW ICT-INFRASTRUCTURE DEFINES ECONOMIC COMPLEXITY:  
INFORMATION POLICY TO FACILITATE INNOVATIONS**

**14-36 : 14-48**

**Andrey N. Petukhov, Sergey D. Erokhin, Pavel L. Pilyugin**

*Moscow Technical University of Telecommunications and Informatics, Moscow, Russia*

**ADAPTATION PROCESSES IN ASYMPTOTIC SAFETY MANAGEMENT**

**14-48 : 15-00**

**Alexander N. Sak**

*Moscow state university of civil engineering, Moscow, Russia*

**USING VECTOR PROXIMITY FOR NLP ANALYSIS OF SPECIALIZED  
TEXTS**

**15-00 : 15-12**

**E.P. Stroganova, S.E. Grychkin**

*Moscow Technical University of Telecommunications and Informatics, Moscow, Russia*

**PHASE INFORMATION DESTRUCTION DURING RADIO SIGNAL  
PROPAGATION IN FLUCTUATING ATMOSPHERE**

**15-12 : 15-24**

**S.L. Yablochnikov, I.O. Yablochnikova**

*Moscow technical University of communications and Informatics, Moscow, Russia*

**V.B. Dzobelova**

*North Ossetian State University named after Kosta Levanovich Khetagurov, Vladikavkaz, Russia*

**A.V. Sharopatova**

*Krasnoyarsk State Agrarian University, Krasnoyarsk, Russia*

**M.N. Makhboroda**

*Academy of the Federal Penitentiary Service of Russia, Ryazan, Russia*

**SYNCHRONIZATION OF REAL AND VIRTUAL PROCESSES**

**IN THE CONTEXT OF THE INDUSTRIAL REVOLUTION 4.0**

**15-24 : 15-36**

**Igor O. Yuskov, Elena P. Stroganova**

*Moscow Technical University of Telecommunications and Informatics, Moscow, Russia*

**CORPORATIVE COMBINED NETWORKS INVESTIGATION WITH**

**NEURAL NETWORKS METHOD**

**15-36 : 15-48**

**L. N. Kazakov, V. A. Botov, E. P. Kubyshkin, D. E. Paley**

*P.G. Demidov Yaroslavl State University, Yaroslavl, Russia*

**ADAPTIVE ALGORITHM FOR FLIGHT RESTRUCTURING**

**OF A GROUP OF UNMANNED AERIAL VEHICLES**

**15-48 : 16-00**

**D. Yu. Vishnyakov, L.N. Kazakov, V.A. Botov**

*P.G. Demidov Yaroslavl State University, Yaroslavl, Russia*

**COMPARISON OF VARIOUS RADIO NETWORK CONFIGURATIONS**

**16-00 : 16-12**

**E.P. Kubyshkin, P.E. Petukhov, D. Yu. Vishnyakov**

*P.G. Demidov Yaroslavl State University, Yaroslavl, Russia*

**SIMULATION OF NETWORK TRAFFIC OF THE INFORMATION**

**EXCHANGE AND CONTROL SYSTEM OF A GROUP OF UNMANNED**

**AERIAL VEHICLES**

**JUNE 29**

**SECTION 2**

**Signal Generating and Shaping Devices**

**SECTION CHAIR**

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

**16-00 : 16-12**

**Abdulmusavvir A. Karimov**

*Moscow Polytechnic University, Moscow, Russia*

**Lolai Husenzoda**

*Institute of Tourism, Entrepreneurship and Service, Dushanbe, Tajikistan*

**Nuriddini Fayz, Rajab Sh. Umaralizoda, Dilshod Ch. Ravshanov** (*Member IEEE*)

*Tajik Technical University named after Academician M.S. Osimi, Dushanbe, Tajikistan*

**MICROSTRIP IMPLEMENTATION OF CROSSOVER ON ARTIFICIAL TRANSMISSION LINES**

**16-12 : 16-24**

**D.V. Kochemasov**

*Radiocomp, LLC, Moscow, Russia*

**N.N. Udalov**

*National Research University MPEI, Moscow, Russia*

**PM AND AM NOISE IN THE RING QUADRATURE LC-OSCILLATORS WITH PHASE SHIFTING RC-CIRCUITS**

**16-24 : 16-36**

**Andrey V. Lenshin, Vladimir N. Tikhomirov, Evgeny V. Shatalov**

*G.F. Morozov Voronezh State University of Forestry and Technologies, Voronezh, Russia*

**Mikhail P. Savchenko, Nikolay M. Tikhmirov**

*I. Kant Baltic Federal University, Kaliningrad, Russia*

**MODERNIZATION OF FREQUENCY SYNTHESIZERS VHF RADIOS**

**16-36 : 16-48**

**V.V. Logvinov, Phan Tuan Anh**

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

**CONTROLLED MICROWAVE AUTOGENERATOR ON A COMPLEMENTARY PAIR OF MOSFET TRANSISTORS**

**16-48 : 17-00**

**A.L. Makarevich, D.V. Garaga, S.M. Sokovnich**



*Pridnestrovian State University of Taras Shevchenko, Tiraspol, Moldova,  
Pridnestrovye*

**L.I. Matyna**

*Institute of Advanced Materials and Technologies "NRU MIET", Moscow,  
Zelenograd*

**V.V. Sorochan**

*Kaluga State University named after K.E. Tsiolkovski, Kaluga, The Russia*

**INVESTIGATION OF THE CHARACTERISTICS OF REGULATED  
VOLTAGE GENERATORS FOR PLL SYSTEMS AND FREQUENCY  
SYNTHESIZERS**

**17-00 : 17-12**

**D.C. Nguyen, O.V. Varlamov** (*Senior Member IEEE*)

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

**SIMULATION MODEL FOR SWITCHING MODE ENVELOPE  
ELIMINATION AND RESTORATION RF POWER AMPLIFIERS  
RESEARCH**

**17-12 : 17-24**

**I.W. Peshkov, N.A. Fortunova, I.N. Zaitseva**

*Bunin Yelets State University, Yelets, Russia*

**MINIMIZING THE CRAMER-RAO LOWER BOUND FOR ANTENNA  
ARRAYS WITH DIRECTIONAL RADIATORS FOR DIRECTION-OF-  
ARRIVAL ESTIMATION OF RADIO SIGNALS**

**17-24 : 17-36**

**Chorshanbe B. Ravshanov, Shokhinchon A. Amirshoev,**

**Dilshod Ch. Ravshanov** (*Member IEEE*), **Rahmonali Z. Mahmadulloev**

*Tajik Technical University Named after Academician M.S. Osimi, Dushanbe, Tajikistan*

**Abdulmusavvir A. Karimov**

*Moscow Polytechnic University, Moscow, Russia*

**SYNTHESIS OF A RING DIVIDER HAVING SMALL DIMENSIONS  
AND WEIGHT**

**17-36 : 17-48**

**Dilshod Ch. Ravshanov** (*Member IEEE*), **Mirzohasan L. Mirzohasanov,**

**Sadi M. Karimov, Faridun B. Holov**

*Tajik Technical University Named after Academician M.S. Osimi, Dushanbe, Tajikistan*

**Abdulmusavvir A. Karimov**

*Moscow Polytechnic University, Moscow, Russia*

**REDUCTION OF THE OCCUPIED AREA OF THE BROADBAND  
POWER DIVIDER**

**17-48 : 18-00**

**Artem A. Shvidkiy, Anastasiia A. Savelieva, Anton A. Zarubin**

*The Bonch-Bruевич Saint-Petersburg State University of Telecommunications,  
Saint Petersburg, Russia*

**APPROACHES ANALYSIS TO DETERMINING THE  
CHARACTERISTICS OF THE LOAD ON THE DISK SUBSYSTEM  
CREATED BY USER APPLICATIONS**

**18-00 : 18-12**

**A.V. Timoshenko** (*Member IEEE*), **A.Yu. Perlov**, **A.M. Kazantsev**  
*National Research University of Electronic Technology, Moscow, Russia*

**N.A. Khodataev**, **K.V. Lvov**

*JSC «Academician A.L. Mints Radiotechnical Institute», Moscow, Russia*

**METHODOLOGY FOR THE DEVELOPMENT OF A DIGITAL TWIN OF  
RADAR STATIONS OF A FUNCTIONAL BLOCK STRUCTURE**

**18-12 : 18-24**

**Maxim Yu. Zuev**, **Elena A. Bobina**, **Sergey S. Loginov**

*KNRTU-KAI named after A.N.Tupolev, Kazan, Russia*

**FPGA IMPLEMENTATION OF A PSEUDO-RANDOM SEQUENCE  
GENERATORS BASED ON THE MODIFIED LORENTZ SYSTEM**

**18-24 : 18-36**

**Oleg V. Varlamov** (*Senior Member IEEE*)

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

**Andrei Grebennikov** (*Senior Member IEEE*)

*Sumitomo Electric Europe Ltd., Elstree, U.K*

**EXPERIMENTAL STUDIES OF ENVELOPE ELIMINATION  
AND RESTORATION HF POWER AMPLIFIER CHARACTERISTICS  
WITH NARROW-BAND MATCHED LOAD**

**JUNE 30**

**SECTION 4**

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

**SECTION CHAIR**

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

**10-00 : 10-12**

**Andrei Yu. Baikov**

*National Research Nuclear University MEPhI;  
Russian University of Transport (MIIT), Moscow, Russia*

**Olga A. Baikova**

*National Research Nuclear University MEPhI;  
FSEEP “Medical College”, Moscow, Russia*

**ON THE POSSIBILITY OF CREATION OF THE MULTI BEAM  
BROADBAND IOT**

**10-12 : 10-24**

**N.A. Kovaleva**

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

**I.V. Mozgovoy**

*Moscow Technical University of Communications and Informatics;  
Lomonosov Moscow State University, Moscow, Russia*

**DESIGN AND IMPLEMENTATION OF A COMPACT FOUR-BAND  
BANDPASS FILTER ON METAMATERIAL**

**10-24 : 10-36**

**Alexander S. Kukharenko, Ruslan V. Shaymardanov**

*General Microwave Co. LLC., Russia, Moscow*

**A.A. Yelizarov (Member IEEE), E.A. Zakirova, A.A. Skuridin**

*National Research University «Higher School of Economics», Russia, Moscow*

**ALGORITHM FOR ANALYZING THE INTEGRITY OF NAVIGATION  
INFORMATION OF CONTROL AND CORRECTING STATIONS  
NETWORK**

**10-36 : 10-48**

**E.A. Liberman, E.A. Nefedov**

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

**ANALYSIS OF EXISTING TECHNOLOGIES FOR CONSTRUCTING  
AN ESPAR ANTENNA SYSTEM. THEORY AND MODELING**

**10-48 : 11-00**

**S.A. Presnyakov, A.D. Kasatkin, N.P. Kravchenko** (*Member IEEE*)

*HSE University, Moscow, Russia*

**S.V. Mukhin**

*Moscow, Russia*

**EXPERIMENTAL ANALYSIS OF THE ELECTRODYNAMIC  
CHARACTERISTICS OF THE COAXIAL-RADIAL LINE TYPE  
SLOW-WAVE STRUCTURES AND ITS MODIFICATIONS**

**11-00 : 11-12**

**K.Y. Sokolov, V.S. Priputin, E.A. Nefedov**

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

**SIMULATION OF A REFLECTIVE ANTENNA ARRAY WITH A LIQUID  
CRYSTAL SUBSTRATE**

**11-12 : 11-24**

**A.A. Yelizarov** (*Member IEEE*), **A.A. Skuridin, I.V. Nazarov, E.A. Zakirova**

*National Research University «Higher School of Economics», Moscow, Russia*

**SIMULATION OF A FREQUENCY SELECTIVE SURFACE  
WITH FRACTAL JERUSALEM CROSS UNIT CELLS**

**11-24 : 11-48**

**DISCUSSION & QUESTIONS**

**JUNE 30**

**SECTION 5**

**Photonics and mathematics for moving objects**

**SECTION CHAIR**

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

**11-48 : 12-00**

**A.G. Tatashev**

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

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

**N.P. Susoev**

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

**M.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), Moscow, Russia*

**ERGODICITY OF STOCHASTIC COMPONENT FOR DSM –  
MULTI-LANE TRAFFIC MODEL**

**12-00 : 12-12**

**M.H. Hasanov, N.A. Atayev**

*Azerbaijan Technical University, Baku, Azerbaijan*

**EARLY CONCEPTUAL MODEL OF NANOSATELLITE WITH LASER  
BEAM CONTROL AND ACTIVE TRANSPONDER SYSTEM**

**12-12 : 12-24**

**Marina S. Moseva, Mikhail G. Gorodnichev, Ksenia A. Polyantseva,**

**Gleb G. Vlasov, Maxim D. Gromov**

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

**DEVELOPMENT OF A SYSTEM FOR FIXING ROAD MARKINGS  
IN REAL TIME**

**12-24 : 12-36**

**K.N. Pankov**

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

**M.M. Glukhov-jr, MIREA – Russian Technological University, Moscow, Russia**

**USING ERROR-CORRECTING CODES TO ENSURE INFORMATION  
SECURITY OF UNMANNED VEHICLES AND IOT SYSTEMS**

**12-36 : 12-48**

**Ksenia A. Polyantseva, Mikhail G. Gorodnichev, Gleb G. Vlasov,  
Yuriy B. Mironov**

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

**DEVELOPMENT OF AN INTELLIGENT SYSTEM FOR ENSURING  
THE SAFETY OF EMPLOYEES AT WORK**

**12-48 : 13-00**

**Andrey M. Valuev, Anatoliy A. Solovyev**

*Mechanical Engineering Research Institute named after A.A.Blagonravov of RAS,  
Moscow, Russia*

**PROBLEMS OF STRUCTURAL AND PARAMETRIC TRAFFIC  
CONTROL FOR AN URBAN ROAD NETWORK FRAGMENT**

**13-00 : 13-12**

**Mikhail R. Yakimov**

*Moscow automobile and road construction state technical university (MADI),  
Moscow, Russia*

**FEATURES OF THE USE OF GEOANALYTICAL DATA IN THE  
DEVELOPMENT OF TRANSPORT PLANNING DOCUMENTS**

**13-12 : 13-24**

**Marina V. Yashina (Member IEEE)**

*Moscow Automobile and Road Construction State Technical University, Moscow, Russia;  
Moscow Aviation Institute (Research University), Moscow, Russia;  
Moscow Technical University of Communications and informatics, Moscow, Russia*

**Pavel I. Pospelov**

*Moscow Automobile and Road Construction State Technical University, Moscow, Russia*

**Daniil V. Lyanguzov**

*Moscow Automobile and Road Construction State Technical University, Moscow, Russia*

**Lolita N. Slabkevich**

*Moscow Automobile and Road Construction State Technical University, Moscow, Russia*

**SIMULATION MODEL OF A RAILWAY CROSSING FOR CAPACITY  
EVALUATION**

**13-24 : 13-48**

**DISCUSSION & QUESTIONS**

**JUNE 30**

**SECTION 3**

**Signal Processing Devices**

**SECTION CHAIR**

**Denis S. Chirov,**

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

**14-00 : 14-10**

**A.S. Adzhemov** (*Member IEEE*), **A.Y. Kudryashova**, **I.G. Kuskova**

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

**INVESTIGATION OF BIJECTIONS DURING THE CONVERSION  
OF A DIGITAL SIGNAL INTO A CONTINUOUS SIGNAL AND INVERSE  
CONVERSION WITH CONVERSIONS CARRIED OUT  
IN THE MODULATOR AND DEMODULATOR**

**14-10 : 14-20**

**Yu.V. Babkin**

*Academician A. L. Mints Radiotechnical Institute, Moscow, Russia*

**A.V. Timoshenko** (*Member IEEE*)

*MIET National Research University of Electronic Technology, Moscow, Russia*

**E.I. Minakov**

*Tula State University, Tula, Russia*

**A.B. Silantyev, C.A.G. Fernandu**

*P.G. Demidov Yaroslavl State University, Yaroslavl, Russia*

**FUNCTIONING OF CHANNELS OF MULTI-SCANNING MONITORING  
IN RADARS WITH REGULAR OR CONTROLLED SURVEILLANCE**

**14-20 : 14-30**

**O.V. Biryukova, I.V. Koretskaya**

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

**INFLUENCE OF ELECTROMAGNETIC INTERFERENCE ON THE  
OPERATION OF THE MEASURING AND CONTROL UNIT**

**14-30 : 14-40**

**Boris B. Borisenko, Sergey D. Erokhin, Ivan D. Martishin,  
Aleksander S. Fadeev**

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

**HOW THE CSE-CIC-IDS2018 DATASET IS RELATED TO THE MITRE  
MATRIX**

**14-40 : 14-50**

**D.S. Chirov (Member IEEE), E.O. Kandaurova, A.A. Kuchumov**

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

**ESTIMATING THE EFFICIENCY OF THE ALGORITHM FOR  
SELECTING THE ADAPTIVE SIGNAL DETECTION THRESHOLD  
IN COGNITIVE RADIO SYSTEMS**

**14-50 : 15-00**

**A.N. Degtyaryov, A.S. Kozhemyakin, I.L. Afonin, G.V. Slyozkin, A.L. Polyakov**

*Sevastopol State University, Sevastopol, Russia*

**TWO-STEP ALGORITHM FOR MATCHED FILTERING OF SIGNALS**

**15-00 : 15-10**

**Victor I. Djigan (Member IEEE)**

*Institute for Design Problems in Microelectronics of RAS, Moscow, Russia*

**LOW COMPLEXITY PARTIALLY ADAPTIVE ANTENNA ARRAY  
BASED ON RECURSIVE LEAST SQUARE ALGORITHM**

**15-10 : 15-20**

**Sergey D. Erokhin, Boris B. Borisenko, Ivan D. Martishin,  
Aleksander S. Fadeev**

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

**THE DATASET FEATURES SELECTION FOR DETECTING AND  
CLASSIFYING NETWORK ATTACKS**

**15-20 : 15-30**

**Evgeniy I. Glushankov, Igor A. Boyko, Dmitriy I. Kirik,  
Konstantin O. Korovin**

*The Bonch-Bruевич St. Petersburg State University of Telecommunications,  
St. Petersburg, Russia*

**CHANNEL VECTOR ESTIMATION USING COVARIANCE MATRICES  
REGULARIZATION METHOD**



**15-30 : 15-40**

**O.V. Ilina**

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

**M.V. Tereshonok**

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

*Moscow Institute of Physics and Technology (National Research University),*

*Moscow region, Russia*

**STUDY OF DEEP CONVOLUTIONAL NEURAL NETWORK FOR  
VEHICLE LOCALIZATION ON BLURRED AERIAL IMAGERY**

**15-40 : 15-50**

**Dmitry Ivanov, Vladimir Ivanov, Natalya Ryabova, Vladimir Ovchinnikov**

*Volga State University of Technology, Yoshkar-Ola, Russia*

**STUDYING THE EFFECT OF CHIRPING OF THE IMPULSE RESPONSE  
OF AN ULTRA-WIDEBAND IONOSPHERIC HF CHANNEL UNDER THE  
INFLUENCE OF INTRAMODE FREQUENCY DISPERSION**

**15-50 : 16-00**

**Vladimir Ivanov, Dmitry Ivanov, Aleksey Elsukov**

*Volga State University of Technology, Yoshkar-Ola, Russia*

**VERTICAL SOUNDING OF IONOSPHERIC RADIO CHANNELS  
BY MULTICARRIER PHASE-SHIFT KEYING SIGNALS**

**16-00 : 16-10**

**N.A. Kandaurov, V.I. Lipatkin, E.O. Kandaurova, K.Y. Sokolov**

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

**IMPLEMENTATION OF A MULTI-CHANNEL DEMODULATOR OF  
DISCRETE-FREQUENCY SIGNALS USING DDC ON A GPU**

**16-10 : 16-20**

**Vladimir Khryashchev, Nikita Kotov, Roman Larionov, Andrey Priorov**

*P.G. Demidov Yaroslavl State University, Yaroslavl, Russia*

**SEMANTIC SEGMENTATION OF SATELLITE SAR-C IMAGES  
USING DEEP LEARNING BASED ALGORITHMS**

**16-20 : 16-30**

**A.Y. Kudryashova, A.S. Adzhemov (Member IEEE), I.G. Kuskova**

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

**INVESTIGATION OF MINIMIZING THE PROBABILITY OF ERRORS  
ARISING IN THE DEMODULATION OF SIGNALS WITH MULTIPLE  
PHASE MODULATION**

**16-30 : 16-40**

**Ilya M. Lerner, A.N. Khairullin, G.I. Il'in**

*Kazan National Research Technical University n.a. A.N. Tupolev – KAI  
(KNRTU-KAI), Kazan, Russia*

**ON THE ISSUE OF SIGNAL RESOLUTION IN THE PRESENCE  
OF INTRASYSTEM INTERFERENCE THROUGH THE USE  
OF THE THEORY OF RESOLUTION TIME**

**16-40 : 16-50**

**Vladislav Lesnikov (Member IEEE), Tatiana Naumovich, Alexander Chastikov**  
*Vyatka State University, Kirov, Russia*

**ALIASING'S STUDY ON BANDPASS SAMPLING**

**16-50 : 17-00**

**Nikita Yu. Liberovskiy, Vladimir S. Priputin, Ivan A. Volkov**

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

**BLIND TWO COMPLEX SIGNALS SEPARATION METHOD  
BASED ON FOURTH ORDER CUMULANTS**

**17-00 : 17-20**

**DISCUSSION & QUESTIONS**

**17-20 : 17-30**

**V.Y. Mikhaylov, R.B. Mazepa**

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

**MODELING AND THE EFFECTIVENESS EVALUATION OF SIGNAL-  
LIKE INTERFERENCE EXPLOITING THE VULNERABILITIES  
OF THE RTS / CTS MECHANISM IN 802.11 NETWORKS**

**17-30 : 17-40**

**N.E. Miroshnikova, A.I. Sattarova**

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

**ANALYSIS OF ERROR-CORRECTION CODES PROPERTIES  
FOR UNDERWATER OPTICAL COMMUNICATION SYSTEMS  
WITH OCDM MODULATION**

**17-40 : 17-50**

**Grach Mkrtchian, Yury Furletov**

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

**CLASSIFICATION OF ENVIRONMENTAL SOUNDS USING NEURAL  
NETWORKS**

**17-50 : 18-00**

**O.G. Morozov** (*Senior Member IEEE*), **I.I. Nureev**, **A.Zh. Sakhabutdinov** (*Member IEEE*), **Rin. Sh. Misbakhov**, **A.A. Kuznetsov**

*Kazan National Research Technical University n.a. A.N. Tupolev-KAI, Kazan, Russia*

**ADVANCED MICROWAVE PHOTONICS SENSOR SYSTEMS: ADDRESS FBG SENSORS, INTERROGATION AND CALIBRATION**

**18-00 : 18-10**

**O.A. Mukhametzyanov**, **T.F. Shcherbakova**, **R.R. Mukhamiev**, **S.S. Sedov**

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

**DEVELOPMENT OF HIGH-RESOLUTION ELECTROCARDIOGRAPHY FOR TELEMEDICINE SYSTEMS**

**18-10 : 18-20**

**Rafael R. Mukhamiev**, **Oscar A. Mukhametzyanov**, **Tatiana F. Shcherbakova**, **Stanislav S. Sedov**

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

**POWERLINE INTERFERENCE'S FILTERING INFLUENCE ON VENTRICULAR LATE POTENTIALS**

**18-20 : 18-30**

**Ksenia I. Nezhivleva**, **Artem M. Drebuzhan**, **Anastasia A. Davydova**, **Andrei Balobanov**

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

**Anastasia I. Mozhaeva**

*The University of Waikato, Hamilton, New Zealand;*

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

**COMPARING OF MODERN METHODS USED TO ASSESS THE QUALITY OF VIDEO SEQUENCES DURING SIGNAL STREAMING WITH AND WITHOUT HUMAN PERCEPTION**

**18-30 : 18-40**

**Natalia E. Poborchaya**, **Elizaveta O. Lobova**

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

**ANALYSIS OF THE USE OF THE KALMAN FILTER FOR SIGNAL DETECTION IN A DIRECT CONVERSION RECEIVER IN MIMO**

**18-40 : 18-50**

**N.V. Ryabova**, **D.V. Ivanov**, **V.A. Ivanov**, **A.A. Kislitsin**

*Volga State University of Technology, Yoshkar-Ola, Russia*

**DEGRADATION PERIOD OF ANOMALOUS DISPERSION PARAMETER OF TRANSIONOSPHERIC WIDEBAND RADIO COMMUNICATION CHANNEL**

**18-50 : 19-00**

**V.G. Sannikov, A.V. Alyoshintsev**

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

**A.N. Sak, Moscow state university of civil engineering, Moscow, Russia**

**ADVANCED DMT MODEM AS AN ELEMENT OF THE PON / XDSL SYSTEM**

**19-00 : 19-10**

**Andrey N. Serov (Member IEEE), Alexander A. Shatokhin, Kirill A. Ivanenko,**

**Nikolay A. Serov, National Research University "MPEI", Moscow, Russia**

**Plamen M. Tzvetkov, New Bulgarian University, Sofia, Republic of Bulgaria**

**FEATURES OF THE IMPLEMENTATION OF THE REACTIVE POWER MEASUREMENT METHOD BASED ON THE APPLICATION OF INTEGRATOR AND DIFFERENTIATOR**

**19-10 : 19-20**

**Alexander A. Shatokhin, Andrey N. Serov (Member IEEE), Nikolay A. Serov, Gennady Antipov, Petr K. Makarychev**

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

**EVALUATION OF THE INFLUENCE OF THE APERTURE TIME AND APERTURE JITTER ON THE RMS MEASUREMENT ERROR**

**19-20 : 19-30**

**Egor A. Shilenkov, Dmitry S. Koptev, Evgeny A. Titenko, Aleksei N. Schitov, Ludmila A. Semenova**

*Southwest State University, Kursk, Russia*

**A MATHEMATICAL MODEL FOR ESTIMATING THE EFFECT OF IONOSPHERIC DISTORTIONS ON THE AMPLITUDE - PHASE FREQUENCY RESPONSE (NYQUIST PLOT) OF PHASE-SHIFT SIGNALS RECEIVED FROM SMALL SPACECRAFTS**

**19-30 : 19-40**

**A.P. Zhuravlev, T.A. Chadov**

*Moscow Technical University of Communication and Informatics, Moscow, Russia*

**QAM SIGNAL DEMODULATION ALGORITHM WITH MINIMUM SAMPLE PER SYMBOL RATE**

**19-40 : 19-50**

**V.V. Ziyadinov, M.V. Tereshonok**

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

**NEURAL NETWORK IMAGE RECOGNITION ROBUSTNESS WITH DIFFERENT AUGMENTATION METHODS**

**19-50 : 20-00**

**DISCUSSION & QUESTIONS**