

2017 International Conference on Information and Telecommunication Technologies and Radio Electronics (UkrMiCo 2017)

**Odesa, Ukraine
11-15 September 2017**



**IEEE Catalog Number: CFP17J07-POD
ISBN: 978-1-5386-1057-2**

**Copyright © 2017 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

| | |
|-------------------------|-------------------|
| IEEE Catalog Number: | CFP17J07-POD |
| ISBN (Print-On-Demand): | 978-1-5386-1057-2 |
| ISBN (Online): | 978-1-5386-1056-5 |

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

CONTENTS

PLENARY SECTION

- 1. Industry 4.0 and Information Communication Technologies 1**
Vorobiyenko Petro
- 2. New Insight on Microwave Dielectrics Thermostability 5**
Y.V. Didenko, D.D. Tatarchuk, V.I. Molchanov and Y.M. Poplavko
- 3. Spectral-Polarimetric Approach Enhancement and Signal Processing Operational Techniques for Remote Sensing of the Atmosphere 9**
Felix J. Yanovsky
- 4. Massive MIMO testing facility for future 5G systems 15**
Yevhen Yashchshyn, Grzegorz Bogdan, Konrad Godziszewski, Paweł Bajurko
- 5. Prediction of Operative Parameters of Land-to-Land and Land-to-Atmosphere Wireless Communication Links 20**
Nathan Blaunstein
- 6. Compact troposcatter station for transhorizon communication 24**
Michael Ilchenko, Serhii Kravchuk, Mykola Kaidenko, Valentin Khytrovskyy
- 7. Power Consumption and Performance Balance (PCPB) scheduling algorithm for computer cluster 28**
Alexander Schill, Larysa Globa, Oleksandr Stepurin, Nataliia Gvozdetska, Volodymyr Prokopets
- 8. Quantum method of secure key distribution in optical fiber communication lines 36**
O.K. Baranovsky, O.Yu. Gorbadey, A.O. Zenevich, Ye.V. Vasiliu

SECTION 1. Radio Engineering

- 9. Adaptive Decomposition OF TV Images 40**
Oleg Gofaizen, Olena Osharovska, Mikola Patlayenko, Volodymyr Pyliavskyy
- 10. Homomorphic two-stage non-causal image filtration in the presence of correlated speckle noise 44**

Oleksii Liashuk, Sergii Zhuk

- 11. Wave and Input Impedance Features in Radioengineering and Quantum Mechanics 49**
Mariia Gindikina, Evgeniy Nelin
- 12. The Efficiency of Combining the Stabilization and Measurement Functions of a Quartz Multi-Frequency Oscillation System 53**
Sergey Pidchenko and Alla Taranchuk, Alexey Yanenko
- 13. The influence of destabilizing factors in the high resolution multispectral imaging systems 58**
Andrii Hryvachevskyi, Sergiy Fabirovskyy, Leonid Lazko, Victor Tkachenko
- 14. Polyharmonic Test Signals Application for Identification of Nonlinear Dynamical Systems Based on Volterra Model 62**
Vitaliy Pavlenko, Viktor Speranskyy
- 15. PROPERTIES OF BINARY CODE SEQUENCES ON THE PERIODICAL CONVOLUTION 67**
Volodymyr-Myron Miskiv, Ivan Prudyus, Roman Yankevych
- 16. Directional and Polarization Characteristics of Crossed Impedance Wire Dipoles with Square Screen 71**
N. P. Yeliseyeva, A. N. Gorobets, V. A. Katrich and S. V. Pshenichnaya
- 17. Resonant Quasi-Optical Systems with Multi-Row Periodic Structures 76**
Rybalko Oleksandr, Rybalko Yu.A., Buriak I.A., Zhurba V.O.
- 18. Numerical Researching the Radiofrequency Chua's Oscillator Based on a Device with Negative Differential Resistance 80**
Andriy Semenov
- 19. Joint quality monitoring system for radio systems with MPEG based compression 86**
Baliar Vladimir, Olena Mazurkiewicz
- 20. Moving Object Signal Peculiarities of an Autodyne Radar with Symmetric Saw-Tooth FM Law 90**
G. P. Ermak, A. S. Vasiliev, V. Ya. Noskov, K. A. Ignatkov
- 21. Measurement of The Phase-Transfer Function of The Software Phase-Locked Loop 94**
A.P. Bondariev, S.I. Altunin
- 22. Improved Compound Multiphase Waveforms with Additional Amplitude Modulation (periodic mode) for Marine Radars 98**
V. Koshevyy, O. Pashenko
- 23. Application Of The Frequency Symbolic Method For The Analysis Of A Quadrature Demodulator Of A Telecommunication System 104**

- Bohdan Mandziy, Ksenia Chaban, Yuriy Shapovalov, Dariya Bachyk*
- 24. Generation of an Azimuthal Polarized Beam in a Terahertz Waveguide Laser 108**
A.V. Degtyarev, M.N. Legenkiy, V.N. Ryabykh, V.S. Senyuta
- 25. Wideband Planar Spiral Antenna with Peripheral Feeding 113**
T.A. Tsaliev, S.V. Siden
- 26. LL-type Filter for Piezoelectric Transducer 117**
Vistyzenko Ye., Movchanyuk A., Sushko I., Novosad A.
- 27. Three- and One-Dimensional Modeling of Microstrip Lowpass Filters 123**
Yana Zinher, Yuliia Adamenko, Volodymyr Adamenko, Evgeniy Nelin
- 28. Experimental investigation of class E power amplifier with shunt filter broadband characteristics for different quality-factor 127**
Makarov D.G., Krizhanovski V.G., Chernov D.V., Grebennikov A.V.
- 29. Scattering Characteristics of Complex Inductive Discontinuities in Three-Layer Planar Structures 131**
Yulia Rassokhina, Vladimir Krizhanovski

SECTION 2. Electronics

- 30. Flexible Humidity Sensor Based on PEDOT Films 135**
Igor Olenych, Olena Aksimentyeva, Yulia Horbenko, Bohdan Tsizh
- 31. Areas of degeneration oscillations in metamaterial cells 139**
Mikhail E. Ilchenko, Alexander P. Zhivkov
- 32. ACOUSTOELECTRONIC DEVICES WITH CONTROLLED CHARACTERISTICS 143**
Lepikh Ya.I.
- 33. Heterojunction photodetector of IR-radiation 149**
Lepikh Ya.I., Ivanchenko I.A., Budijanskaja L.M., Santonij V.I.
- 34. Microelectronic Device for Humidity Measuring with the Frequency Output Signal 153**
Oleksander Zviahin, Anton Savytskyi, Iaroslav Osadchuk
- 35. Magnetoresistance oscillations in InSb and GaSb whiskers at low temperatures 159**
Anatoly Druzhinin, Igor Ostrovskii, Yuriy Khoverko, Natalia Liakh-Kaguy
- 36. Investigation of Complex Control System for High Voltage Glow Discharge Electron Sources 164**

I.V. Melnyk, V.G. Melnyk, B.A. Tugai, S.B. Tuhai

- 37. Substructural properties of nanocrystalline Cu₂ZnSnS₄ films deposited by pulsed spray pyrolysis 169**
Dobrozhan O.A., Opanasyuk N.M., Kurbatov D.I., Opanasyuk A.S.
- 38. Improved Reliability of Interconnects of Electronics Components 173**
Nevliudov Igor, Palahin Victor, Razumov-Fryziuk Ievgenii
- 39. The effect of laser processing on the structural characteristics and elemental composition of CZTS thin film obtained by spray pyrolysis method 178**
A. V. Shamardin, A. S. Opanasyuk, D. I. Kurbatov, A. Medvids
- 40. Alloy Scattering Relaxation Time Simulation 182**
Iryna Baida, Volodymyr Moskaliuk
- 41. Method of thermal quality control flexible structure 186**
Nevliudov Igor, Gurina Darya, Garyachevskaya Irina
- 42. Ageing Processes in One-, Two- and Three-layered Thick Films Based on Modified Thermistor Ceramics 191**
Halyna Klym, Ivan Hadzaman, Oleh Shpotyuk, Yuriy Kostiv
- 43. Nondestructive strength diagnostics of solder joints on printed circuit boards 195**
I. Kovtun, J. Boiko, S. Petrashchuk
- 44. Magnetic field sensors based on gold nanofilm, which are operable in the new generation fusion reactors environment 199**
O. Prystopiuk, I. Bolshakova, M. Radishevskiy, O. Vasiliev

SECTION 3. Telecommunications

- 45. Analysis of the IR-UWB Communication Channel in Case of “Non-Energy” Receiver 203**
I.V. Trubarov, S.G. Bunin, S.O. Mykhailov
- 46. Method for calculating the energy loss of a light signal in a telecommunication Li-Fi system 208**
Romanov O. I., Hordashnyk Y.S, Dong T.T.
- 47. Television systems color space metric 215**
Gofaizen Oleg, Pyliavskiy Volodymyr
- 48. Method for Optimal Use of 4G/5G Heterogeneous Network Resources under M2M/IoT Traffic Growth Conditions 221**
Klymash M., Panchenko O., Beshley H., Beshley M.
- 49. Optical Transport Network Capacity Optimization 226**

Breskin V. A., Rozenvasser D. M.

- 50. Modeling the effects of material dispersion in fiber-optic communication lines 230**
Odegov N., Bahachuk D.
- 51. Efficiency of G.fast technology application on TPP type telephone cables 235**
Vasyl Oreshkov, Vitaliy Balashov
- 52. Three-level Method of Hierarchical Coordination Routing in Multi-Area Network 240**
Oleksandr Lemeshko, Oleksandra Yeremenko, Olena Nevzorova, Tetiana Vavenko
- 53. Network Traffic Monitoring System for the Quality of Service Control 245**
Oleksandr Rolik, Valerii Kolesnik, Viktor Barna
- 54. IMS: MODEL AND CALCULATION METHOD OF TELECOMMUNICATION NETWORK'S CAPACITY 251**
Romanov O. I., Nesterenko M.M., Veres.L.A., Hordashnyk Y.S
- 55. Assessment of information efficiency of error-correcting codes in Plotkin bound 256**
Uryvsky L., Pieshkin A.
- 56. Analysis of digital signal quality indicators based on analytic and stochastic modeling 260**
Uryvsky L., Moshynska A., Osypchuk S.
- 57. Sample signals of the generalized class 264**
Vitaliy Balashov, Leonid Lyakhovetsky, Irina Barba
- 58. Probabilistic and time characteristics of the G/M/1 QS with the Weibull distribution of arrivals 268**
Strelkovskaya Irina, Solovskaya Irina
- 59. Measuring subnets of colored Petri net models 272**
Shmeleva T.R.
- 60. The device of phase jitter estimation in digital paths of telecommunication systems 277**
Gennadiy Bortnyk, Mikola Vasylykivskyi, Vasyl Kychak
- 61. PROVIDING TELECOMMUNICATION SERVICES TO ANTARCTIC STATIONS 281**
Liana Afanasieva, Serhii Kravchuk, Dmytro Minochkin
- 62. The Neuro-Fuzzy Controller for Routing in Telecommunication Networks 285**
Olena Semenova, Andriy Semenov

SECTION 4. InfoCommunications

- 63. Intelligent Networking and Bio-Inspired Engineering 290**
Andriy Luntovskyy, Oleksiy Nedashkivskiy
- 64. Assessment of Cloud Service Provider Quality Metrics 294**
Sergii Telenyk, Petro Bidyuk, Eduard Zharikov, Maxim Yasochka
- 65. Estimating of the preparedness level of telecommunications operators for the introduction of IPv6 in the own networks 299**
Vadym Kaptur, Andrey Kviatkovsky
- 66. Peculiarities of Database for Kharkiv Incoherent Scatter Radar 303**
Oleksandr Bogomaz, Artem Miroshnikov, Igor Domnin
- 67. Advances in Software for Analysis of Kharkiv Incoherent Scatter Radar Data 307**
Oleksandr Bogomaz, Dmytro Kotov, Sergii Panasenko, Leonid Emelyanov
- 68. Ontology model of intelligent modeling system for marine facilities identification 312**
Novogradska R.L., Globa L.S., Koval A.V., Senchenko V.R.
- 69. State Cyber Defense Formation and Development in Conditions of Hybrid Challenges and Threats 317**
Yuriy Danyk
- 70. Integrated methods of information security in telecommunication systems 321**
Zakharchenko M.V., Korchynskii V.V., Kildishev V.I.
- 71. Test for penetration in Wi-Fi network: attacks on WPA2-PSK and WPA2-Enterprise 325**
Tamara Radivilova, Hassan Ali Hassan
- 72. The method of resources involvement scheduling based on the long-term statistics ensuring quality and performance parameters 329**
Mariia Skulysh
- 73. Web-services Selection Based on Fuzzy Preference Relations 333**
Anna Palii, Rina Novogradska