2019 International Conference on Electrotechnical Complexes and Systems (ICOECS 2019)

Ufa, Russia 22 – 25 October 2019



IEEE Catalog Number: CFP19S88-POD **ISBN:**

978-1-7281-1729-4

Copyright © 2019 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: | CFP19S88-POD |
|-------------------------|-------------------|
| ISBN (Print-On-Demand): | 978-1-7281-1729-4 |
| ISBN (Online): | 978-1-7281-1728-7 |

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





2019 International Conference on Electrotechnical Complexes and Systems (ICOECS)



YFATY KAO



Ufa State Aviation Technical University Ufa, Russia 22 - 25 October 2019

TABLE OF CONTENTS

| Khajrullin Irek Khanifovich, Maksudov Denis Vilevich, Yangirov Ilgiz Flusovich, Okhotnikov Mikhail Valerievich Magnetoelectrodehydrator | 2 |
|---|-----|
| Yusup Isaev, Olga Vasileva | |
| Optimization of Technological Parameters of the Coaxial Magnetoplasma Accelerator | 7 |
| by Varying of Solenoid Inductance | |
| Yury Afanasyev, Diana Pashali, Alexey Demin, Oxana Yushkova | 12 |
| The external magnetic field of damping electromechanical energy converters | 12 |
| Marina B. Gumerova, Natalya L. Babikova, Rustam I. Gareev | 17 |
| The cascade synchronous–asynchronous motor | 1 / |
| Anatoliy V. Sapsalev, Sergey A. Kharitonov, Rustam S. Aipov, Maksim A. Zharkov, | |
| Konstantin A. Kuratov, Nikolay P. Savin | 21 |
| Prospects for the Use of a Magnetic Gearbox in the Electrical Equipment of Aircraft | |
| Viliya Ivanova, Igor Ivanov, Natalia Rozhentsova | |
| Justification of the set of technical and technological criteria when designing a | 26 |
| combined power supply system for multi-story residential buildings | |
| Varganova A.V., Panova E.A., Kushmil O.E. | |
| Automation of the selection process and graphical display of measuring instruments on | 31 |
| single-line diagrams of 6–220 kV substations | |
| Vladimir Fetisov, Shamil Akhmerov | 36 |
| Charging Stations with Open Contact Pads for Maintenance of Aerial Robots | 50 |
| Rustam S. Aipov, Raushan R. Nugumanov, Anatoliy V. Sapsalev, Maksim A. Zharkov | 42 |
| Flat Linear Asynchronous Electric Drive Millstone Mill for Grain | 42 |
| Maksudov Denis Vilevich, Okhotnikov Mikhail Valerievich | 46 |
| Modeling of the barrier discharge in the exhaust gases of automobile | 40 |
| Alexey Demin, Diana Pashali, Oxana Yushkova | 50 |
| Methods for rapid diagnosis of responsible units operators state | 30 |
| Puzakov Andrey Vladimirovich | 54 |
| Fault diagnosis in automotive alternators based on the output voltage parameters | 34 |
| Puzakov Andrey Vladimirovich | |
| Using parameters of the external magnetic field for diagnosing faults in automotive | 59 |
| alternator | |
| Rustam Khamitov, Aleksandr Gritsay, Denis Tyunkov, Igor Zakharov | 63 |
| The equivalent circuit of the electrohydrodynamic pumps | 03 |
| Vera Vakhnina, Aleksey Chernenko, Dmitry Kretov, Olga Samolina | 67 |

| The Method for Assessing the Permissible Overload Capacity of Power Transformers | |
|--|------|
| during High Geomagnetic Activity | |
| Natalia Rozhentsova, Oksana Regir, Andrei Kotsubinski, Leonid Fetisov | 72 |
| Development of a Multi-Agent Model of Electric Power Consumer | |
| Alexander S. Semenov, Ayaal N. Egorov, Yakov S. Kharitonov, Yuriy V. Bebikhov, | |
| Ilya A. Yakushev, Oleg V. Fedorov | 76 |
| The assessment of the higher harmonics impact on the operation of variable-frequency | |
| electric drive systems at mining enterprises | |
| Rinat R. Nasyrov, Valentin S. Gerasimov | 82 |
| Modern approaches to the training of operating staff using virtual reality | |
| Denis Babitsky, Dmitriy Toporkov | 96 |
| Investigation and improvement of flux density harmonic content in electrical machines | 86 |
| with fractional slot tooth concentrated windings | |
| Daniil Shevtsov, Yevgeniy Mashukov, Sergey Averin, Galina Ulyaschenko, Vasily | 90 |
| Kryuchkov | 90 |
| Electric Motor Regulators Development With The Enhanced Quality Drivers | |
| Daniil Shevtsov, Yevgeniy Mashukov, Sergey Averin, Galina Ulyaschenko, Vasily | |
| Kryuchkov | 94 |
| Arc Fault Discharges Indication by Deviation From Regular Processes in The Loads of | |
| Aerial Vehicles Electrical Systems | |
| B. S. Zechihin, R. Yu. Misyutin, S.V. Zhuravlev, K. Yu. Korenchuk | 00 |
| Investigation of the mechanical strength of a magnetic-non-magnetic sleeve of a | 99 |
| permanent magnet generator | |
| Nayef Kayed Abdulla Thabet, Vladimir Fetisov, Oleg Dmitriyev | 105 |
| Electric Heating Unit for Oil Pipeline Paraffin Deposit Monitoring System | |
| Shilin Aleksandr Nikolaevich, Shilin Alexey Aleksanrovich, Kuznetsova Nadezhda | 100 |
| Sergeevna | 109 |
| Geoinformation approach in design of smart grid | |
| Shilin Aleksandr Nikolaevich, Koptelova Irina Aleksandrovna, Kuznetsova Nadezhda | 114 |
| Sergeevna | 114 |
| Digital modeling of electrical and electronic devices | |
| Vadim S. Alekseev, Vadim V. Zakharov, Ivan I. Artyukhov, Sergey V. Trigorly | 110 |
| Numerical Simulation of the Processes of Microwave Heating of Dielectrics in | 118 |
| Traveling Wave Chambers | |
| Alexander Starikov, Sergey Lisin, Daniil Rokalo | 100 |
| Technical Implementation of the High-Speed Response Servo Drive at the | 123 |
| Programmable Logic Device | |
| N.K. Poluyanovich, M.N. Dubyago, A.A. Shurykin, D.V. Burkov | 120 |
| Estimation of partial discharge energy in a mathematical model of thermal fluctuation | 129 |
| processes of a power cable | |
| Aleksandr Gritsay, Nikolay Kostin, Dmitry Tyunkov, Igor Zakharov, Rustam Khamitov, | 125 |
| Valeriy Nesteruk | 135 |
| On confidence interval composition in short-term forecasting of electricity consumption | |
| Aleksander Fokeev, Bullat Subgatullin, Yossef Eslam Ahmed | 140 |
| Methods of electrical loads calculation and selection of electrical power equipment | |
| Dmitry Dezhin, Roman Ilyasov, Konstantin Kovalev, Dmitry Shishov, Boris Zechikhin, | 140 |
| Daniil Shevtsov | 146 |
| 12-phases magneto-electric direct drive turbo generator | |
| Natalia Rozhentsova, Viliya Ivanova, Leonid Fetisov, Innaz Yarmuhametov | 1.40 |
| Development of a stand construction concept for safe and efficient after-repair tests of | 148 |
| induction motors up to 1 kV | 1.55 |
| Dmitri Platonov, Valentin Stepanov, Natalya Golubeva | 152 |

| The influence of the probabilistic nature of the graphs of the electrical load of river port | |
|--|-------------|
| cranes on the additional calculated power losses | |
| Julia Nekrasova, Anastasia Sudareva, Andrey Kolosov, Konstantin Kovalev | |
| Hardware-Software Complex of the Mobile BrainComputer Interface for Technical | 156 |
| Means of Rehabilitation | |
| Andrei Chekin, Yaroslav Moroshkin, Konstantin Gubernatorov, Mikhail Kiselev | |
| Impact of reliability of state-of-the-art electrical units on architecture of power supply | 162 |
| system of modern aircraft | |
| Leonid German, Aleksandr Serebryakov, Vladimir Osokin | |
| The study of transient processes in discretely adjustable setting reactive power | 168 |
| compensation | |
| Aleksandr Serebryakov, Vladimir Osokin | |
| Calculation of two-phase short circuit current in electrical network when it is powered | 172 |
| from the transformer with connection of windings according to the scheme Y/Δ -11 | |
| Elena Muravyova, Elza Enikeeva | |
| Analysis of the Power Consumption of the Booster Pump Station Using Simulation | 175 |
| Models of Fluid Control | 175 |
| Farit Gizatullin, Aliya Karimova | |
| Theoretical determination of the energy parameters of spark discharges in | 179 |
| | 1/9 |
| semiconductor spark plugs of aircraft engines | |
| Y. Rakhmanova, L. Roginskaya, A. Lobanov, Z. Yalalova | 184 |
| Production of Plate Magnet Cores in Modern Transformers | |
| Irek Mustaev, Evgeniy Semivelitchenko, Vladimir Ivanov, Nataly Maksimova, Timur | 100 |
| Mustaev | 188 |
| Designing an electrotechnical system from the perspective of a sociophysical approach | |
| Aleksei Ilyin, Georgy Milovzorov, Marat Khakimyanov | |
| Diagnostics of the Condition of Sucker-Rod Pumping Units after the Analysis of | 193 |
| Wattmeter Cards | |
| Elizaveta P. Grakhova, Arsen A. Ishmiyarov, Ivan K. Meshkov, Albert Kh. Sultanov, | |
| Irina L. Vinogradova, Guzel I. Abdrakhmanova, Azat R. Gizatulin | 197 |
| Energy efficiency improvement of OFDM-based Radio-over-fiber systems enabled with | 177 |
| PAPR decrease method | |
| Obukhov S.G., Plotnikov I.A., Masolov V.G. | 202 |
| The effective energy storage for hybrid power systems with renewable energy sources | 202 |
| Arsen Mesropyan, Artem Orazov, Anastasia Vorobyeva | 206 |
| Developing and testing electrohydropneumatic actuators for exoskeleton | 200 |
| Yu.V. Zubkov, Yu.A. Makarichev, Yu.N. Ivannikov | |
| Comparison of surface-mounted permanent magnet and interior-mounted permanent | 211 |
| magnet starters for gas turbine engines electrical start | |
| Oskar S. Gurevich, Anatoliy I. Guliyenko | |
| Concept to select characteristics of electric drives for fuel supply systems of aircraft gas | 216 |
| turbine engines | - |
| Flyur R. Ismagilov, Viacheslav Ye. Vavilov, Vladimir I. Bekuzin, Vladislav S. Chirkov | |
| Design Analysis of Submersible Brushless DC Motors for the Oil and Gas Industry | 219 |
| Sitnikov Maksim A., Sepp Yurij I. | |
| Influence of Contact Connection's Vibration on Induction Motor's Parameters under | 224 |
| During Start-up | <i>22</i> 4 |
| Flyur R. Ismagilov, Viacheslav Ye. Vavilov, Valentina V. Ayguzina, Nikolay Yu. | |
| | |
| L'vov, Timofey A. L'vovskiy | 230 |
| Optimal design of electric machines by using genetic algorithms: mathematical | |
| apparatus to determine machine parameters | 225 |
| Anton N. Varyukhin, Flyur R. Ismagilov, Viacheslav Ye. Vavilov, Luca Papini, | 235 |

| Valentina V. Ayguzina, Mikhail V. Gordin | |
|---|-----|
| Design of 150-kVA 24,000-rpm High-Speed Permanent-Magnet Generator for More | |
| Electric Aircrafts | |
| Danis. R. Farrahov, Aybulat. Kh. Miniyarov | |
| Development of The Universal Apparatus for Induction Motors with Combined Winding | 240 |
| Design | 210 |
| Danis. R. Farrahov, Aleksandr A. Gerasin, Anton A. Mednov, Aybulat. Kh. Miniyarov | |
| Fault-tolerant high-speed permanent magnet generator for electric supply autonomous | 244 |
| | 244 |
| objects Natalia Klochkova, Alla Obuchova, Alexander Protsenko | |
| | 249 |
| The design problem of induction units with motion elements | |
| Pavel A. Grakhov, Andrey V. Fedin, Vasikh Kh. Yasoveev | 252 |
| Researches of displacement devices based on magnetostrictive bilayer plates under the | 253 |
| action of pre-stressing caused by external and internal torques | |
| Maksim A. Zharkov, Sergey A. Kharitonov, Vadim E. Sidorov, Regina Yu. Dubkova | |
| The Analysis of the Reactive Launch of Three-stage Synchronous Generator for Aviation | 259 |
| StarterGenerator Device | |
| Maksim A. Zharkov, Regina Yu. Dubkova, Vadim E. Sidorov, Sergey A. Kharitonov | 264 |
| Starter-Generator System for Gas Turbine Engine Based on AC-AC Converter | 204 |
| I. Sayakhov, D. Shemelin | 270 |
| Diagnosis of Composite Materials In Electrical Machines | 270 |
| Zhernakov Vladimir Sergeyevich, Mardimasova Tamara Nikolaevna, Arslanov Marat | |
| Rashitovich | 274 |
| Modeling of Threaded Connection with Threaded Insert | |
| Mineev A. V., Yasoveev V. Kh. | |
| Analysys of the influence of turbines blades tips optical properties for the results of the | |
| measurements of radial displacement by logo method using a multichannel fiber optical | 278 |
| collector | |
| Ildar Shakhmaev, Bulat Gaysin, Nikolay Novikov | |
| Method of Detecting of Emergency Cascade Processes in Electric Power Systems | 282 |
| Milovzorov Dmitry Georgievich | |
| On the Harmonics Control in the Energy Consumption of Electrical Systems | 288 |
| Victor Demidovich, Yuri Pervalov | |
| · · · · · · · · · · · · · · · · · · · | 292 |
| Advanced automated complex using induction and resistance furnaces for precise | 292 |
| heating of the titanium billets | |
| Zhernakov Vladimir Sergeyevich, Mardimasova Tamara Nikolaevna, Akbashev Vadim | |
| Rinatovich | 296 |
| Calculation of nonlinear material deformation processes under nonisothermal loading | |
| and elastoplastic unloadinger | |
| Oleg Khasanov, Zimfir Khasanov, Natalia Khasanova | 300 |
| The modeling of multicircuit control systems in robotized technological complex | 500 |
| I. Sayakhov, G. Zinatullina | 304 |
| Testing of High-Torque Electric Motor For Gearless Electromechanical Actuator | 501 |
| Andrey Dar'enkov, Victor Sokolov, Dmitry Badugin, Ivan Lipuzhin | |
| Research of Dynamic Operation Modes of Transformer Voltage Regulator on | 308 |
| Mathematical Model | |
| Eduard L. Grekov, Victor A. Sorokin, Evgeny S. Shelikhov | 214 |
| Synchronization of pulse-width modulation of the active rectifiers connected in parallel | 314 |
| Ganeish Velmurugan, Seang Shen Yeoh, Tao Yang, Serhiy Bozhko | 220 |
| Piecewise Modelling Approach for Specific Switched Reluctance Machines | 320 |
| Mikhail Okhotnikov, Irek Khairullin, Ilnar Yamalov, Denis Maksudov, Aleksandr | 22. |
| Nusenkis | 324 |
| | |

| Hybrid electrostatic filter for this purification | |
|--|-------------|
| Hybrid electrostatic filter for thin purification | |
| Cosimo Spagnolo, Sharmila Sumsurooah, Serhiy Bozkho | 328 |
| Advanced smart grid power distribution system for More Electric Aircraft application | |
| Shmelev Alexander, Yasoveev Vasih | 334 |
| Mathematical model of magnetostrictive linear displacement transducer | |
| Grigory S. Voronkov, Elena A. Smirnova, Igor V. Kuznetsov | 220 |
| The method for synthesis of the coordinated group DPCM codec for unmanned aerial | 338 |
| vehicles communication systems | |
| Denis Gusakov, Denis Masalimov, Viktoriia Vavilova | |
| Transformer with a Hybrid Magnetic Core for High-Efficiency Aircraft Transformer- | 342 |
| Rectifier Unit | |
| Daniil Shevtsov, Dmitry Shishov, Dmitry Sukhov | 347 |
| Self Oscilating Transformer-Based Current Transducer | 517 |
| V.V. Goryunova, T.I. Goryunova | 351 |
| Computer ontology of testing processes of electrical systems | 551 |
| Milovzorov Georgiy Vladimirovich, Milovzorov Dmitry Georgievich, Milovzorov | |
| Alexey Georgievich | 355 |
| Design of inductors with static and rotating magnetic field with microprocessor control | |
| Gennady P. Kornilov, Timur R. Khramshin, Ildar R. Abdulveleev | |
| Increasing stability of electric drives of rolling mills with active front ends at voltage | 360 |
| sag | |
| Konstantin Kovalev, Julia Nekrasova, Nickolay Ivanov, Sergey Zhurzvlev | 264 |
| Design of All-Superconducting Electrical Motor for Full Electric Aircraft | 364 |
| Sergey Zhuravlev, Boris Zechihin, Nikolay Ivanov, Julia Nekrasova, Anatoly Larionov | |
| Calculation of the Magnetic Field of an Electric Machine with Annular Superconducting | 369 |
| Armature Winding and External Screen | |
| Kovalenko P. Y., Senyuk M. D., Mukhin V. I., Korelina A. A. | 27(|
| Synchronous Frequency Calculation Based on Synchrophasor Measurements | 376 |
| Zh. A. Sukhinets, N. N. Prokopenko, A. I. Gulin, A. N. Krasnov, O. V. Dvornikov, A. | |
| L. Galiev | 380 |
| Dynamic temperature measurement of GTE gases with interference elimination | |
| Damir Gainanov, Ekaterina Kashirina, Yana Khabirova | |
| The Indicators Validity Increase of the Renewable Power Source Development in | 385 |
| Regional Electric Power Programs | |
| Shabanov Vitaliy Alekseyevich, Pashkin Vasily Valerievich, Ivashkin Oleg Nikolaevich | |
| The mode of anti-switching of the electric drive during the reverse rotation of the | 389 |
| impeller of the fan and pumping units | 007 |
| Cong Lin, Lingfei Xiao, Robert Sattarov | |
| Power System Control of More-electric Aircraft Engine Based on Double Closed Loop | 393 |
| Feedback | 575 |
| M.Yu. Petushkov, D.V. Shcherbina, A.S. Sarvarov | |
| Diagnostics of DC motors in the mining and processing production of OJSC "MMK" | 399 |
| Irek Khairullin, Azat Valeev, Ilnar Yamalov, Aleksandr Nusenkis, Mikhail Okhotnikov | |
| Energy Losses Reduction on Power Lines | 403 |
| Tatyana Kostukova, Vadim Saubanov | |
| Design and placement of renewable energy sources on the ground | 408 |
| Robert R. Sattarov, Evgeniy M. Fedosov, Rustam R. Garafutdinov, Tatiana A. Volkova | |
| Application of PSCAD in Practical Studies of Electrical Power Engineering Students | 413 |
| | |
| Roginskaya Lyubov, Gorbunov Anton, Mednov Anton | <i>/</i> 10 |
| Mathematical model of a multifunctional highfrequency transformer for | 419 |
| electrotechnological installation power supplies | |

| Abdullina E. Yu., Efanov V.N. | 423 |
|--|------|
| Providing supermaneuverability for electricallyactuated aircraft | |
| Anas Gishvarov, Marsel Davydov | 429 |
| Accelerated reliability tests of aircraft gas turbine engine with DC and AC generators | |
| Anas Gishvarov, Georgy Ageev, Marsel Davydov | 42.4 |
| Justification of program for accelerated periodic tests of aircraft turbogenerator - | 434 |
| alternating current source | |
| Olga Shikulskaya, Mikhail Shikulskiy, Gennady Popov, Issa Bogatyrev, Victor | |
| Samsonov, Alla Kachalova | 438 |
| Energy-information Modeling of Additive Temperature Error Correction of Strain- | |
| Gauge Bridge Circuits | |
| Salvatore La Rocca, Antonino La Rocca, Adam Walker, Gaurang Vakil, David Gerada, | |
| Mahir Al-Ani, Tianjie Zou, Ramkumar Ramanathan, Chris Gerada, Alastair McQueen, | |
| Krzysztof Paciura | 443 |
| Numerical study of the impact of different cooling arrangements on a high | |
| length/diameter ratio motor for electric commercial vehicle | |
| Andrey V. Styskin, Nelja G. Urazbakhtina | 448 |
| Improving Dynamic Performance of the Switched-Reluctance Motors | 440 |
| Lyubov Roginskaya, Denis Gusakov, Denis Masalimov | 452 |
| Multi-phase Auto- and Transformer Rectifier System for Aircraft | 432 |
| Lyubov Roginskaya, Anton Gorbunov, Anton Mednov | 456 |
| Installed Power of Transformers for Equivalent Multiphase Rectification Circuits | 430 |
| Lyubov Roginskaya, Anton Gorbunov | 463 |
| The Choice of Parameters of Special Types of Inductors | 403 |
| Jorg Kammermann, Igor Bolvashenkov, Jon Lekuona Ugalde, Hans-Georg Herzog | |
| Choice of Phase Number for a Multiphase Traction Motor to Meet Requirements on | 471 |
| Fault Tolerance | |
| Gennadij Kornilov, Olga Gazizova, Aleksandr Bunin, Mihail Bulanov, Alexander L. | |
| Karyakin | 477 |
| Improving the quality of voltage in the conditions of the oxygen-converter shop of | 477 |
| metallurgical production | |
| Olga V. Gazizova, Alexander P. Sokolov, Nikolay T. Patshin, Aleksey V. Malafeev, | |
| Alexander L. Karyakin | 400 |
| The use of non-synchronous automatic reclosing in power plants of large industrial | 482 |
| enterprises with a complex network configuration | |
| Rustam Gaynutdinov, Sergey Chermoshentsev | |
| Studies of Electromagnetic Disturbances in Coupling Path by Application of Intentional | 487 |
| Ultrashort Electromagnetic Pulses | |
| Rustam Gaynutdinov, Sergey Chermoshentsev | |
| Study Radiation from Radio Transmitters Antennas Influence on the UAV Onboard | 491 |
| Equipment | 171 |
| Dmitriy Golubovich, Sergey Chermoshentsev | |
| Virtual Testing of the Emission of Electromagnetic Interference from Electronic Means | 495 |
| According to the Electromagnetic Compatibility Requirements | 175 |
| Chesalin A.N., Grodzenskiy S.Ya. | |
| Modification of the WaldBoost algorithm to improve the efficiency of solving problems | 499 |
| of technical diagnostics of electrical systems | オンフ |
| Zarembo Igor' Viktorovich, Zherebcov Aleksei Anatolievich, Urazbakhtin Ruslan | |
| | |
| Rustemovich, Zinatullina Guzel Salavatovna | 503 |
| On the use of amorphous low-coercivity materials in high-torque permanent magnets | |
| synchronous electric motors | 507 |
| Igor Bolvashenkov, Jörg Kammermann, Hans-Georg Herzog, Andrey V. Brazhnikov, | 507 |

| Nikolay N. Dovzhenko, Vasilii I. Panteleev | |
|--|------|
| Nikolay N. Dovznenko, vashi I. Paneleev Novel Principle of Aero/Hydro-Dynamic Lift Creation, Methods of Its Technical | |
| Implementation, and Prospects of Its Application | |
| Flyur Ismagilov, Chris Gerada, Michele Degano, Oscar Gurevich, Anatoliy Guliyenko, | |
| Viacheslav Vavilov, Denis Gusakov | 513 |
| Fault-Tolerant Electrical Machines for Transport Applications | 515 |
| Nikolay Potapchuk, Shamil Ismagilov, Rail Murtazin | |
| To the Question of the Loss Reduction in Distribution Networks | 520 |
| Flyur R. Ismagilov, Gennadiy G. Kulikov, Viacheslav Ye. Vavilov, Valentina V. | |
| Ayguzina | |
| Improving the quality of designing electromechanical energy converters for aircrafts by | 523 |
| using a system-analytical modeling with the application of intelligent information | 525 |
| technologies | |
| Valery A. Kokovin, Vladimir I. Diagilev, Saygid U. Uvaysov, Svetlana S. Uvaysova | |
| Multifunctional Power Electronic Converter with Remote Control | 528 |
| Viktoriia Vavilova | |
| The Possibility of Using the Orbital Angular Momentum in Radio Communication | 533 |
| Systems | 555 |
| Rustem Zaynutdinov, Larisa Zaynutdinova, Vladimir Ilyichev | |
| Performance Evaluation of On-Grid Solar Power Stations in a Office Building in the | 537 |
| Climatic Conditions of Astrakhan Region | 001 |
| Denis Chernov, Alexey Sychugov | |
| Mathematical modeling of information security threats of automated process control | 541 |
| systems | 0.11 |
| Galiev Anvar Lutfrakhmanovich, Karimov Ruslan Dinarovich, Urazbakhtin Ruslan | |
| Rustemovich, Shemelin Denis Igorevich | |
| Features of the permanent magnet submersible electric motors design for the oil | 545 |
| industry | |
| Karimov Ruslan Dinarovich, Urazbakhtin Ruslan Rustemovich, Farrakhov Danis | |
| Ramilevich, Chirkov Vladislav Sergeevich, Shemelin Denis Igorevich | 550 |
| The stator slot manufacturing technology influence on the submersible thyratron motors | 550 |
| output parameters | |
| Sagit Valeev, Natalya Kondratyeva, Alexey Lutov | |
| Energy Consumption Optimization of Production Lines of Enterprise for Process Safety | 554 |
| Provision | |
| Murat Guzairov, Arkadij Frid, Alexey Vulfin, Victoria Berkholts | |
| The concept of integrity of telemetric information about the state of an aircraft power | 558 |
| plant monitoring | |
| Irina M. Kirpichnikova, Ilkhom B. Makhsumov | |
| Calculation of gross, technical and economic potential of solar energy of the Republic | 564 |
| of Tajikistan | |
| Igor Starostin, Sergey Khalyutin, Albert Davidov, Alexander Lyovin, Alexander | _ |
| Trubachev | 570 |
| The Development of a Mathematical Model of Lithium-Ion Battery Discharge | 210 |
| Characteristics | |
| Anton N. Varyukhin, Pavel S. Suntsov, Mikhail V. Gordin, Viktor S. Zakharchenko, | _ |
| Daniil Ya. Rakhmankulov | 574 |
| Efficiency Analysis of Hybrid Electric Propulsion System for Commuter Airliners | |
| A N Varyukhin, V.S Zakharchenko, A.V. Vlasov, M. V. Gordin, M.A.Ovdienko | |
| Roadmap for the Technological Development of Hybrid Electric and Full-Electric | 577 |
| Propulsion Systems of Aircrafts | |
| A.V. Geliev, A.N. Varyukhin, V.S. Zakharchenko, I.O. Kiselev, D.I. Zhuravlev | 584 |

| Conceptual Design of an Electric Propulsion System Based on Fuel Cells for an | |
|---|-----|
| Ultralight Manned Aircraft | |
| Kiya Bushmeleva, Anton Zanin, Saygid Uvaysov, Aida Uvaysova | |
| Automation of the Search Process and Gross Errors Elimination of Telemetry | 601 |
| Parameters in Energy Systems | |
| Gulbakhar Yussupova, Sharafat Mirzakulova, Duriya Daniyarova, Dusmat | |
| Zhamangarin, Azamat Annabayev, Saule Nurymova | 607 |
| Analysis of Gaussian and Sinus Apodization Profiles | |
| V.I. Nefedov, I.B. Kozlovsky, N.A. Mirolyubova, S.N. Zamuruev | 611 |
| Optimization of Characteristics in Nonlinear Systems | 011 |
| Alexandr Zaiko, Ernest Kilmetov | 615 |
| Research of the characteristics of bridge sensory modules based on the AMR effect | 015 |
| Safiullin Ruzil Akhnafovich, Yangirov Ilgiz Flusovich, Khalikov Albert Rashitovich, | |
| Ayupova Aigul Rafisovna | |
| Spring drive for defectoscope | |
| Safiullin Ruzil Akhnafovich, Yangirov Ilgiz Flusovich, Khalikov Albert Rashitovich, | |
| Safina Gulnara Frilovna | |
| Engineering calculation of inductor parameters for gas pipelines | |