

2018 International Conference on Applied and Theoretical Electricity (ICATE 2018)

**Craiova, Romania
4 – 6 October 2018**



**IEEE Catalog Number: CFP1899S-POD
ISBN: 978-1-5386-3807-1**

**Copyright © 2018 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:	CFP1899S-POD
ISBN (Print-On-Demand):	978-1-5386-3807-1
ISBN (Online):	978-1-5386-3806-4

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

TABLE OF CONTENTS

Plenary session

- P01 Horia Hedesiú – Technical University of Cluj-Napoca: *Real Time Simulation and Testing of Complex Systems. Overview and Trends.....N/A*
- P02 Elena Helerea – “Transilvania” University of Brasov: *Electrical insulation lifetime assessment and prediction.....N/A*
- P03 Gheorghe Manolea – University of Craiova: *Milestones in electrical engineering in Oltenia: education, research, production.....N/A*

Regular sessions

Paper ID		CS – Circuits and Systems
		Session co-chairs: Dragos Niculae; Mihai Iordache
134	Razvan Asanache, Mihai IORDACHE, Dragos Niculae, Marilena Stănculescu, Maria Lavinia Bobaru, Victor Bucata - The computation of the kQ-product and properties of wireless power transfer systems.....1	
152	Maria Cristina Nițu, Marian Duță - Calculation of Surges Transmitted Between Transformer Windings Using the Coupled Circuit Model.....7	
153	Sorin Deleanu, Mihai Iordache, Dragos Niculae, Bogdan Venescu, Mihaela Cristina Turcu, Neculai Galan - The Overvoltage Distribution across Transformer Windings in presence of Long Feeders.....13	
182	Andrei Marinescu, Ionel Dumbrava - AC Resistance of Inductive Coupler with Pitch Coils for Contactless Power Transfer.....19	
185	Stănculescu Marilena, Sîrbu Ioana-Gabriela, Mandache Lucian, Niculae Dragoș, Voinea Marius, Bucată Victor, Iordache Mihai - About Pathologic Linear Circuits With Inconsistent Initial Conditions.....25	
Paper ID		MG – Magnetics
		Session co-chairs: Dana Constantinescu; Paul Popescu
78	Alin-Iulian Dolan - Improvement of static force characteristic of AC Electromagnet Using DOE and FEM.....31	
143	Daniela Vesa, Marian Greconici, Dumitru Toader, Constantin Blaj, Ildiko Tatai - About the force localization exerted by the magnetic field on the ferrofluids. The Quincke’s effect.....36	
Paper ID		CSYS – Control Systems
		Session co-chairs: Dorin Popescu; Eugen Subtirelu
103	Beke-Szikszay Tibor-László, Corneliu Marinescu, Dănilă Adrian - Software Control Method for a Solar Tracking System.....42	
114	Cristian Ioan Hoarcă, Florentina Magda Enescu - On the energy efficiency of standalone fuel cell/renewable hybrid power sources Part I: Simulation results for constant load profile without RES power.....48	
115	Cristian Ioan Hoarcă, Florentina Magda Enescu - On the energy efficiency of standalone fuel cell/renewable hybrid power sources Part II: Simulation results for variable load profile with different renewable energy sources profiles (RES).....54	
160	Nadia Stoicuta, Olimpiu Stoicuta, Teodor Pana - On-line Electrical Parameters Estimation of an Induction Motor.....59	
170	Horatiu Roibu, Dorin Popescu, Marian-Marcel Abagiu, Nicu-Geeorge Bizdoaca - Human-Machine Interfaces for Robotic System Control.....63	

- 187 Alexandru Bitoleanu, Mihaela Popescu, Vlad Constantin Suru, Florin Alexandru Teodorescu - Synthesis of the Battery Charging System of a Stand-Alone Electric Locomotive Using the Traction Converter.....69

Paper ID PES – Power and Energy Systems (1)
Session co-chairs: Constantin Bulac; Leonardo-Geo Manescu

- 71 Silvia-Maria Diga, Nicolae Diga, Adelaida-Mihaela Duinea - Current issues in the management by dispatching of the operating regime and maneuvering with long electric lines in the national power system.....75
- 73 Liviu Ruieneanu - Increasing the flexibility of trigeneration systems for a larger presence of renewables in the energy mix.....80
- 75 Denisa Rusinaru, Leonardo Geo Manescu, Adrian Cojoaca, Miron Alba, Constantin Bulac, Daniela Rosca - Grid Integration of the Small Generation Units in LV Distribution Networks.....84
- 120 Flaviu Dilertea, Flavius-Dan Şurianu - Transient Response of Synchronous Generator to Faults on the Evacuation Overhead Line.....90
- 124 Ammar AL-Gizi, Mohammed AL-Saadi, Sarab AL-Chlaihawi, Aurelian Craciunescu, Mustafa Abbas Fadel - Experimental Installation of Photovoltaic MPPT Controller Using Arduino Board.....96
- 129 Ioan-Dragoş Deaconu, Marilena Stănculescu, Aurel Ionuţ Chirilă, Valentin Năvrăpescu, Horia Andrei - On Automatic Transfer Switch System Security.....102
- 189 Carmen Maria Negrița, Cristian Bratu, Denisa Ruşinaru, Leonardo-Geo Mănescu - Prosumer Investment in Renewable Energy Units. An Economic Analysis.....108

PES – Power and Energy Systems (2)
Session co-chairs: Denisa Rusinaru; Horia Hedesi

- 109 Horia Balan, Horatiu Dacian Laslo, Ioan Berinde - Modeling Three-Phase Short-Circuits in Grids Connected to Windfarms.....114
- 111 Horia Balan, Horațiu Dacian Laslo, Traian Varodi - Testing Digital Relays through Secondary Currents Injection.....120
- 116 Mircea-Ion Buzdugan, Radu A. Munteanu - Influence of Harmonics on Heat Recovery Equipment.....126
- 155 Nicu Constandache, Dorel M. Stanescu, Mihai Sanduleac, Carmen Stanescu, Ion Tristiu, Alexandru Mandis - Smart Meters, PMU and PQ data analysis in Active Distribution Grids – Case Studies in MV networks.....132
- 161 Nadia Stoicuta, Olimpiu Stoicuta - The Analyze of the Electrical Energy Production in Romania by Categories of Power Plants.....137
- 163 Catalin Petrea Ion, Corneliu Marinescu - Small wind turbine selection for urban environment operation.....143
- 164 Dumitru Sacerdoțianu, Marcel Nicola, Claudiu-Ionel Nicola, Florica Lăzărescu - Research on the Continuous Monitoring of the Sag of Overhead Electricity Transmission Cables Based on the Measurement of their Slope.....148

PES – Power and Energy Systems (3)
Session co-chairs: Silvia Maria Diga; Paul Mihai Mircea

- 91 Paul-Mihai Mircea, Marian Ciontu, Ion Marin, Ion Mircea, Denisa Rusinaru, Gabriel Cosmin Buzatu, Florinel Popescu - The influence of neutral treatment system type on the efficiency / performance of the MV networks.....153
- 93 Paul-Mihai Mircea, Marian Ciontu, Ion Marin, Lucian Mandache, Leonardo Geo Manescu, Doru Ursu, Cristian Bratu - Influence of the single-phase fault place on the neutral treatment system parameters in MV networks.....159
- 95 Mihaela Ilie, Sorin Ilie, Ionuţ Murareţu - Applying Game Theory Economics to Clean Renewable Energy Source Implementation in Urban Areas.....165
- 98 Cosmin – Gabriel Buzatu, Radu-Cristian Dinu, Cristian Bratu, Felicia-Elena Stan Ivan - Using the Visual Basic Program for Modeling the Heat Transfer Through Glazed Building Elements.....171

- 147 Chioncel Cristian Paul, Lazar Meda Alexandra, Spunei Elisabeta, Tirian Gelu Ovidiu - Determination of the optimal operational energy zones and the mathematical models for wind power plants.....176
- 176 Marcel Nicola, Claudiu-Ionel Nicola, Sebastian Popescu, Dumitru Sacerdoțianu, Marian Duță - Power Quality Analysis System Based on LabVIEW Real-Time and Reconfigurable FPGA Modules Using Wavelet Transform.....181

Paper ID EMD – Electrical Machines and Drives (1)
Session co-chairs: *Virgiliu Fireteanu; Sorin Enache*

- 60 Monica-Adela Enache, Aurel Campeanu, Ion Vlad, Sorin Enache - Use of Numerical Methods in Computation of Operation Characteristics for Brushless Direct Current Motors.....187
- 61 Monica-Adela Enache, Aurel Campeanu, Sorin Enache, Ion Vlad - Testing Stand for Low-Power Electrical Machines.....193
- 72 Raluca-Cristina Presură, Marian-Ștefan Nicolae, Ion Vlad - Using Numerical Methods for Establishing the Performances of Low Power Asynchronous Motors.....199
- 101 Virgiliu Fireteanu, Alexandru-Ionel Constantin, Assam Zorig, Aissa Chouder - Impact of the Stator Short-circuit, Rotor Broken Bar and Eccentricity Faults on Rotor Force for Loaded and No-load Induction Motors Operation.....205
- 104 Svilen Rachev, Lyubomir Dimitrov, Konstantinos Karakoulidis, Ivaylo D. Ivanov, Cornelia-Victoria Anghel Drugarin - Electric Power Losses of Frequency Controlled Electric Drive with High-Voltage Induction Motor.....213
- 128 Florin Ravigan, Laurentiu Alboteanu, Marius Dumitriu, Ionut Zglimbea - BLDC Controller for two-wheel vehicles.....219
- 136 Gabriel Nicolae Popa, Corina Maria Diniș, Sorin Ioan Deaconu, Iosif Popa - On Currents Asymmetry Protection For Three-Phase Low Voltage Induction Motors.....223
- 146 Marius Alexandru Drancă, Mihai Chirca, Sorin Iulian Cosman, Ștefan Breban - Design Analysis of a Permanent Magnet Brushless Generator with Two Counter Rotating Rotors for Small-Wind Turbine.....229

EMD – Electrical Machines and Drives (2)
Session co-chairs: *Remus Pusca; Sergiu Ivanov*

- 130 Berzan Vladimir, Ermurachi Iurie, Ivanov Sergiu - SST Medium Voltage Transformer with Bidirectional Power Transmission for Electric Railway Transport.....234
- 135 Gabriela Dana Petropol Serb, Ion Petropol Serb - Designing a Graphical User Interface with Matlab to select the ideal covering coefficient of the polar pitch for a salient pole synchronous generator calculation.....240
- 159 Yelda Veli, Alexandru M. Morega, Lucian Pîslaru-Dănescu, Mihaela Morega - Numerical Modeling of a Flyback Converter with Different Magnetic Media, for Micro-Power Controllers.....245
- 162 Sorin Deleanu, Mihai Iordache, Dragos Niculae, Marilena Stanculescu, Mihai Dogaru, Neculai Galan - Dynamic Operation of High Power Synchronous Generator in Asynchronous Regime or encountering Three-Phase Shortcircuit.....251
- 165 Marius Dranca, Mihai Chirca, Stefan Breban - Design evaluation of several electric machines topologies for propulsion of a railway vehicle.....259
- 167 Younes Azzoug, Arezki Menacer, Raphaël Romary, Rémus Pusca, Tarek Ameid, Abdelkarim Ammar - Fault Tolerant Control for Speed Sensor Failure in Induction Motor Drive based on Direct Torque Control and Adaptive Stator Flux Observer.....264
- 168 Alexandru Dalea, Mircea Ignat, Sorin Deleanu, Mihai Iordache, Neculai Galan - Optimal Operation of the Rotary Magnetostrictive Motor.....270
- 173 Adrian Vintila, Fevronia-Despina Roman - Brush Lifting Systems for Wound Rotor Induction Motors.....278

Paper ID PE – Power Electronics
Session co-chairs: Mihaela Popescu; Iustinian Neaca

- 86 Mihaela Popescu, Alexandru Bitoleanu, Mircea Dobriceanu, Florin Alexandru Teodorescu - On the AC-Connecting of a System for Active Filtering and Regeneration in Active DC-Traction Substations.....283
- 106 Amir Bogza, Dan Floricau, Lucian Parvulescu - Selection of the Power Components for a Phase-Shifted Full-Bridge Converter with Current Doubler.....289
- 154 Diana-Raluca Biba, Sorin Muşuroi, Marcus Svoboda - Powertrain 48V Power Supply Proposal and Safety Validation Voltage Levels for BLDC Motor Driver ASIC.....295
- 186 Mihăiță Lincă, Constantin Vlad Suru, Cristina Alexandra Preda - Indirect Current Control Algorithm Implementation for an Active Filtering System Using Constant Switching Frequency Hysteresis Controllers.....300

Paper ID ECEMB – Electromagnetic Compatibility and Engineering in Medicine and Biology
Session co-chairs: Andrei Marinescu; Mircea-Emilian Ardeleanu

- 46 Hussain Alnamir - Occupational Exposure to Power Frequency Magnetic Fields in Intensive Care Unit Rooms.....306
- 70 Ardeleanu Mircea-Emilian, Nicolescu Paul, Stănescu Dan-Gabriel, Pişleag Denis - New Analysis Regarding Electromagnetic Field Emissions of a Wireless Device.....312
- 123 Bouleanu Iulian, Miclaus Simona, Bechet Andrei Cristian, Bechet Paul, Annamaria Sarbu, Helbet Robert - Assessment of the Near Field Level in the Vicinity of an Inverted V Antenna used for HF emission.....318
- 151 Viorica Voicu, Livia-Andreea Dina, Petre-Marian Nicolae, Relu Adrian Aipu, Ion Pătru, Paul-Adrian Nicolescu - Modeling the Electromagnetic Field Distribution in a Shielded Enclosure Lined with Radio-Frequency Absorbers.....322
- 174 Andrei Macovei, Alexandru Boitan, Bogdan Trip, Vlad Butnariu, Georgiana Roşu, Simona Halunga - Detection of electromagnetic emissions transmitted on the power line through electrical conduction.....327
- 175 Alexandra Idita, Georgiana Roşu, Alexandru Boitan, Vlad Butnariu, Bogdan Trip, Octavian Baltag - Study of shielding effectiveness on spurious emissions of information systems by means of metallic and carbon powder screens.....331
- 184 Cristian Győző Haba, Liviu Breniuc, Romeo Cristian Ciobanu, Ioan Tudosa - Development of a wireless glove based on RFID Sensor.....337

Paper ID IAPP – Industrial Applications (1)
Session co-chairs: Elena Helerea; Daniela Popescu

- 47 Mitică Iustinian Neacă - Simulink Model for Resistive Tubular Heater.....343
- 62 Gheorghe-Eugen Subtirelu - Advanced System for Testing of Three-Phase Induction Machines.....349
- 67 Constantin Florin Ocoleanu, Ioan Popa - A new approach to determine heat transfer coefficient of crimped connections.....355
- 77 Laurentiu Alboteanu, Gheorghe Manolea, Florin Ravigan - Automatic sorting and handling system.....359
- 79 Adrian Cernaianu, Daniela Popescu, Corina Cernaianu, Marius Ciurezu - Studies on the determination of process parameter variation at dry monodisc braking.....364
- 80 Adrian Cernaianu, Corina Cernaianu, Daniela Popescu, Dragos Tutunea - Studies on the cooling systems for the production of electricity through Seebeck effect with TEG elements.....372
- 81 Daniel Popescu, Marian Popescu, Corina Cernaianu, Daniela Popescu - Regarding The Structural Analysis Of Silicone Rubber Obtained From Recycling Used Composite Electric Isolators.....378

- 188 Lambert Pierrat, Elena Helerea, Livia Sangeorzan - Statistical and Physical Approaches on the Initial Failure Rate of High Voltage Power Transformers.....384

IAPP – Industrial Applications (2)

Session co-chairs: Virginia Ivanov; Lucian Mandache

- 45 Filip Niculescu, Adrian Săvescu, Claudia Borzea - Analogue flow control of a network of centrifugal air compressors.....N/A
- 107 Alexandre De Bernardinis, Roger Reynaud, Cyrille Beuto Yakam, Zeineb Chabrak, Hamid Ben Ahmed, Richard Lallemand, Juliette Kouv - Supercapacitors Aging Study: Models Theoretical Analysis and Attempt to Physical Correlation related to Applied Cycles for Transport Application.....390
- 121 Anca Purcaru, Dorina Purcaru, Ioan-Mircea Gordan, Marian-Ştefan Nicolae - Electrical Signal Data Acquisition and Recording Customized System, with High Sampling Rate, for Data Analysis Optimization of Three-Phase Power Supply Consumers.....398
- 127 Bogdan Liviu Protea, Cristian Muscai, Valentin Navrapescu, Elisabeta Spunei, Ion Piroi, Florina Piroi - Computer Assisted Equipment Selection for Components of Electric Panels.....404
- 137 Corina Maria Diniş, Gabriel Nicolae Popa - Automation of a Pneumatic Cement Transport Installation Using PLC.....409
- 148 Ion DOBRIN, Dan Enache, Nicolae Stancu, Andrei Dobrin, Iuliu Popovici, Alexandru M. Morega, Mihaela Morega - Conceptual Model of a Variable Gap Magnet for a GeV Electron Spectrometer.....415
- 169 Lucian Nicolae Pintilie, Ioana Cornelia Gros, Vasile Mihai Suci, Florin Roman - Multifunctional Socket for Smart Grid Applications using Ethernet over Power Lines and USB over IP technologies.....420
- 171 Virginia Ivanov, Maria Brojboiu, Sergiu Ivanov - Diagnosis with Analytic Model of a Rectifier for Faults on the Load Side.....425

EEE – Environment Engineering and Equipment

Session co-chairs: Mihaela Popescu; Iustinian Neaca

- 40 Fausto Bozzini, Paul Gabriel Anoaica - Electric Energy Reduction On Terraced House With Storage Battery Photovoltaic Plant - Real Case.....429
- 145 Niculae Boteanu, Gabriela Dana Petropol Serb - Integrated System of Water Engineering for Smart Residences.....436

EETS – Electrical Engineering in Transportation Systems

Session co-chairs: Ioan Popa; Alexandru Tudosie

- 54 Jenica-Ileana Corcau, Liviu Dinca, Adrian Hurezeanu - Power Management on Board on HAPS.....440
- 55 Jenica-Ileana Corcau, Liviu Dinca, Adrian Hurezeanu - Power Converters for a HAPS Power Source Model.....445
- 57 Cuman Dionis, Dinca Liviu, Corcau Jenica-Ileana - Study of Dynamic Stability a Cannard Configuartion UAV449
- 63 Daniel Cristian Cismaru - Energy Efficient Train Operation using Simulated Annealing Algorithm and SIMULINK model.....455
- 89 Alexandru-Nicolae Tudosie - Injection System for an Aircraft Jet Engine with Coolant Injection into the Combustor.....459
- 131 Elisabeta Spunei, Ion Piroi, Florina Piroi - LED and Incandescence Lamps in Railroad Repetitive Light Signals: A Comparative Performance Analysis.....465
- 156 Elisabeta Spunei, Ion Piroi, Cristian Muscai, Florina Piroi, Cristian Paul Chioncel, Protea Bogdan - Computer Assisted Diagnosis of CED-CR2 Installations: Part II.....469
- 181 Alexandru-Nicolae Tudosie - Engine Speed Control Unit for an Aircraft Jet Engine with Coolant Injection into the Combustor.....473

Paper ID AMEE – Applied Mathematics in Electrical Engineering
Session co-chairs: Dana Constantinescu; Paul Popescu

- 100 Adela Ionescu, Florian Munteanu, Raluca Efrem - On Feedback Controlling of a Smooth Version of Chua Dynamical System.....479
- 112 Florian Munteanu, Adela Ionescu - A Note on the Behavior of the Lü Dynamical System in a Slightly Simplified Version.....483
- 177 Marcela Popescu, Paul Popescu - Fast movements and jerk mechanics.....487
- 178 Marcela Popescu, Paul Popescu, Ileana-Diana Nicolae, Marian-Stefan Nicolae, Radu-Florin Marinescu, Petre-Marian Nicolae - A Jerk Model With Friction for the Speed Produced by an Induction Motor Drive System.....494
- 179 Dana Constantinescu - Two-time scale differentiable dynamical systems with applications in engineering.....500
- 180 Iulian Petrisor, Dana Constantinescu - Electron diffusion in a sheared magnetic field and a stochastic electrostatic field revisited.....506

Workshop

A Century of Energetics in Romania
Workshop co-chairs: Petre-Marian Nicolae; Victor Vaida

- W01 Victor Vaida: *A Century of Energetics in Romania*.....N/A
- W02 Ionel Ilie, Laviniu Danciu: *The thermal power plants in Oltenia, the pillars of the Romanian energetics*.....N/A
- W03 Gheorghe Manolea: *Seven decades of academic studies in Electrotechnics at University of Craiova*.....N/A
- W04 Petre-Marian Nicolae: *Doctoral Studies and Scientific Research at the Faculty of Electrotechnics / Electrical Engineering from University of Craiova*.....N/A
- W05 Mihai Neațu, Cristian Chiper: *History of electricity transmission and distribution in Oltenia*.....N/A
- W06 Eugen Butoarcă: *Electricity distribution in Oltenia. Vision to the future*.....N/A