International Conference
MODERN POWER SYSTEMS
8th Edition - Cluj-Napoca, 21-23 May 2019

FINAL PROGRAM

Modern Power Systems Conference

8th Edition

Cluj-Napoca, 21-23 of May 2019

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Welcome to MPS 2019 !

It is with great pleasure that the Technical University of Cluj-Napoca together with its partners SDEE Transilvania Nord SA and Transelectrica SA welcomes you to the 8th International Conference on Modern Power Systems to be held in Cluj-Napoca, Romania, from 21st to 23rd of May, 2019. MPS has been established in 2006 as an international conference that provides a major forum for scientists, young researchers, PhD students and engineers to present and discuss the latest developments in electrical power engineering.

The Local MPS Organizing Committee is very pleased to welcome friends and colleagues, both senior and new, to Cluj-Napoca, in 2019. Given the major provocations now facing the electrical power industry and the energy sector in general, this conference provides an excellent start-up for talented young engineers and researchers to discuss some of these challenges. Also, the conference will provide the opportunity to meet specialists in these areas, old friends and become more informed about the new trends in electrical power engineering.

We must proudly underline that our MPS 2019 conference is technically co-sponsored by IEEE Romanian Section and it is included in the IEEE meetings database as conference record #46825.

After a two-stage review process, performed by an international referees' committee, a final technical program incorporating more than 140 papers has been established. The selected papers for presentation on the Conference will be preserved as conference proceedings and archived on IEEE Xplore database for ongoing reference by the power engineering community. The Local Organizing Committee has made every effort to ensure that your stay in Cluj-Napoca is both professionally and socially enjoyable. We have arranged several events including a Welcome Cocktail at the Chios Social Longe and the Conference Gala Dinner at Wonderland Resort, two special places, representative for the local people hospitality.

The organization of MPS 2019 has been supported by the dedicated efforts of the Local Organizing Committee, the International Steering Committee and many colleagues from prestigious Romania universities. The conference has also been enhanced by the participation of our patrons, our supporters and exhibitors, for whom many thanks are due. The Local Organizing Committee is very grateful to our invited speakers, and last but not least to the Authors for their effort and high quality of the communications presented.

The organizing team and I wish you a very pleasant and fruitful stay in Cluj-Napoca at MPS 2019!

Prof. Călin MUNTEANU, Chairman of MPS 2019

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Conference Information

Conference Date and Venue

21st to 23rd of May 2019

Grand Hotel Napoca (4*), Octavian Goga str. no. 1, Cluj-Napoca
Tel. +40 264 580 715

Registration

Registration will be opened at Grand Hotel Napoca on Tuesday 16^{00} – 20^{00} and also on Wednesday, Thursday between 08^{00} – 16^{00}

Social Program

Welcome Cocktail – sponsored by ENERGOBIT

Wednesday, 22nd of May 2019

19^{00} – 22^{00}

Welcome cocktail will be held at Chios Social Lounge located in the central park of Cluj-Napoca (10 min walking distance from the Grand Hotel Napoca).

http://chios.ro

Conference Banquet- sponsored by ELECTROGRUP

Thursday, 23rd of May 2019
19^{00} – 24^{00}

Conference Banquet will be held at Wonderland Cluj Resort located about 2 km away from Cluj-Napoca. Busses will be available from Grand Hotel Napoca for attending the event. Latest information will be available at the conference desk.
www.wonderlandcluj.ro

Program at a Glance

Wednesday, 22nd of May

9^{00}-9^{30}	**Opening Ceremony** Room ATENA	
9^{30}-11^{00}	**Plenary Session 1** Room ATENA	
11^{00}-11^{30}	*Coffee Break* Room ROMA	
11^{30}-13^{00}	**Oral Session –** T2 Room ATENA	**Oral Session –** T5 Room VIENA
13^{00}-14^{00}	*Lunch* Room ROMA	
14^{00}-15^{00}	**Poster Session 1** T2 + T3 + T4 + T5 + T6 + T12 + T13 + T14 + T15 Room FOAYER	
15^{00}-16^{30}	**Oral Session –** T1 Room ATENA	**Oral Session –** T7 Room VIENA
16^{30}-17^{00}	*Coffee Break* Room ROMA	
17^{00}-18^{30}	**Oral Session –** T4 Room ATENA	**Oral Session –** T8 Room VIENA
19^{00}-22^{00}	*Welcome cocktail* CHIOS SOCIAL LOUNGE, CLUJ-NAPOCA	

Thursday, 23rd of May

9^{00}-10^{00}	**Poster Session 2** T1 + T7 + T8 +T9 + T10 + T11 Room FOAYER	
10^{00}-11^{30}	**Plenary Session 2** Room ATENA	
11^{30}-12^{00}	*Coffee Break* Room ROMA	
12^{00}-13^{30}	**Oral Session –** T6 Room ATENA	**Oral Session –** T3 Room VIENA
13^{30}-14^{30}	*Lunch* Room ROMA	
14^{30}-18^{30}	**Round Table 1** Room ATENA	**Round Table 2** Room VIENA
18^{30}-19^{00}	**Closing ceremony** Room VIENA	
19^{00}-24^{00}	*Conference banquet* WONDERLAND RESORT, CLUJ-NAPOCA	

Conference Topics

T1 Transmission System Operation, Control and Development
T2 Distribution Systems and Dispersed Generation
T3 Renewable energy
T4 Smart Grids
T5 Overhead Lines, Insulated Cables and Substations
T6 Protection and Automation
T7 Analysis, Modelling, Simulation and Optimal Design in Power Systems
T8 Electromagnetics
T9 Electromagnetic Compatibility, Power Quality and Environmental Impacts
T10 HVDC and Power Electronics
T11 Electric Machines and Drives
T12 High Voltage Equipment and Materials
T13 Informatics and Telecommunications in Power Systems
T14 Electricity Markets and Regulation
T15 Education in Electrical and Power Engineering

Keynote Speakers

Short-term Prediction of Energy Consumption in Demand Response for Blocks of Buildings: Dr-BoB Solution

Nashwan DAWOOD, Professor, Associate Dean, Research & Innovation, Teesside University, UK

Professor Nashwan Dawood is a specialist in project construction management and the application of IT in the construction process and energy reduction in buildings. This has ranged across a number of research topics including BIM technologies and processes, sustainability, Information Technologies and Systems (5D, VR, Integrated databases), Professor Dawood is currently Associate Dean, Research & Innovation, Teesside University, UK He has extensive experience of leading internationally recognized research work in BIM technology and processes and in the application of 5D modeling in construction processes, and has successfully generated peer reviewed funded projects from the Engineering and Physical Sciences Research Council, the Technology Strategy Board, and EU H2020.

His currently involved in 5 EU H2020 projects. Professor Dawood has published over 220 research papers and sits on the editorial board of a number of journals and conferences. His work has been recognized outside of the academic sphere, for example with its short-listing for the Constructing Excellence Innovation Award.

Professor Dawood also has significant and long-standing experience of working with major industrial partners in the UK and internationally to develop and apply research results as part of further collaborative projects. In particular he is currently running international research and development projects in South Korea, Japan, Qatar, Europe and USA in the areas of 5D modeling, serious game engine technology application to training and ICT (Information and Communication technologies) for energy efficient buildings. He is also regularly invited to be a keynote presenter in a international events.

Numerical simulation impact on engineering development

Johan DECONINCK, Professor, Faculty of Engineering, Department of Electrical Engineering (IR-ETEC), Research Group Electrochemical and Surface Engineering (SURF), Vrije Universiteit Brussel (VUB) BELGIUM

Scientific activities: Head of the Computational Electrochemistry Group. Research for more than 30 years, focused on the numerical modeling of electrical and electrochemical systems in the field of electroplating, cathodic protection, electrochemical machining or forming and corrosion. The focus is on quantifying electrochemical processes in view of understanding and application.

Since 1992 Prof. Deconinck has continuously been participating in multiple European (10) and national projects often as a project coordinator. He is also involved in bilateral research projects with IMEC, SCK and EADS (München, Germany) and in two cotutelle PhD's with the Technical University Cluj Napoca (TUCN) Romania. Member of PhD commission of the faculty of Engineering.

Industrial activities: Co-founder of a spinoff company Elsyca that focuses on electrochemical modeling of industrial processes an electrical modeling of cathodic protection and AC mitigation of buried pipelines.

Scientific Output: 95 web of science papers, h-factor 20, in various fields: mathematical modeling (boundary and finite elements), electrical engineering, plating, electrochemical machining and forming, corrosion. Promotor of 30 defended PhD's.

Concepts and tools to categorize and exploit the electrical demand

Gianfranco CHICCO, Professor, Dipartimento Energia "Galileo Ferraris", Politecnico di Torino, ITALY

Research interests: power system analysis, distribution system analysis and optimization, electrical load management, energy efficiency and environmental impact of multi-energy systems, data analytics, artificial intelligence applications to power and energy systems, renewable energy sources and distributed generation, and power quality

Gianfranco CHICCO is a Full Professor of Electrical Energy Systems at Politecnico di Torino (POLITO), Italy. He is responsible of the Torino unit of the Italian Consortium ENSIEL, and of the Torino unit of the University Association GUSEE.

In 2017 he received the title of "Doctor Honoris Causa" from the University Politehnica of Bucharest, Romania. In 2018 he received the title of "Doctor Honoris Causa" from the Technical University "Gheorghe Asachi" of Iaşi, Romania. He is the Past President/Coordinator of the Electrical Engineering Courses at POLITO (2007-2015), and the Past National Secretary of GUSEE (2016-2018). He is a Fellow of the IEEE (Power & Energy Society), a Member of the Italian Association of Electrotechnics, Electronics, Automation, Informatics and Telecommunications (AEIT), and a registered professional Engineer in the Province of Torino, Italy.

He was/is the scientific responsible, the local coordinator or a participant in various projects funded by national and European grants (among which FP6 DIGENAS, FP7 SiNGULAR, FP7 eHighway2050, H2020 Flexmeter, H2020 Store&Go, H2020 MIGRATE, and H2020 OSMOSE). He is an Editor of the IEEE Transactions on Smart Grid and of the IEEE Transactions on Sustainable Energy, an Associate Editor and Subject Editor of Energy, the International journal (Elsevier), an Editor of Sustainable Energy Grids and Networks - SEGAN (Elsevier), and an Editor of Energies (MDPI). His International scientific production includes one book, five book chapters, over 60 journal publications, and over 120 publications in conference proceedings.

Novel Electric Generator Topologies for Micro-Wind Power Applications

Mircea M. RADULESCU, Professor, Technical University of Cluj-Napoca, ROMANIA

Professor Mircea Radulescu received the Dipl.-Ing. degree in electrical engineering (with honors) from the Technical University of Cluj-Napoca, Cluj-Napoca, Romania, in 1978, and the Ph.D. degree in electrical engineering from the Polytechnic University of Timisoara, Timisoara, Romania, in 1993.

Since 1983, he has been with the Faculty of Electrical Engineering, Technical University of Cluj-Napoca, where he is currently a Full Professor in the Department of Electric Machines and Drives, and the Head of the Special Electric Machines and Light Electric Traction (SEMLET) Research Laboratory. He is the author or co-author of more than 180 published scientific papers in refereed technical journals and international conference and symposium proceedings.

His teaching and research activities include classical and special electric machines; computer-aided design of electromechanical devices; design and control of small electronically commutated motors; actuators and mechatronic drives; light electric traction systems; design and analysis of small-scale renewable energy equipment. He was an Invited Professor at Swiss Federal Institute of Technology Lausanne – EPFL, Switzerland; Helsinki University of Technology, Espoo, Finland; RWTH Aachen, Aachen, Germany; University of Akron, Akron, USA; University 'Pierre et Marie Curie', Paris, France; University of Picardie 'Jules Verne', Amiens, France, and Ecole Centrale de Lille, Villeneuve d'Ascq, France. He is an Associate Editor of the international scientific quarterly 'Electromotion'. His biography is listed in several editions of 'Who's Who in the World' and 'Who's Who in Science and Engineering'. Prof. Radulescu is a Senior Member of IEEE, USA and a Member of IET, UK. He is also member of the International Steering Committees of several conferences and symposia in the field of electric motor drives, electric traction and renewable energy.

Wednesday, 22nd of May

9^{00} – 11^{00}

ROOM: ATENA

Opening Ceremony

9^{00} – 9^{30}	**Welcome and Introduction**

Plenary Session 1

9^{30} – 10^{15}	**Short-term Prediction of Energy Consumption in Demand Response for Blocks of Buildings: Dr-BoB Solution** *Keynote speaker: Nashwan DAWOOD, Teesside University, UK*
10^{15} – 11^{00}	**Numerical simulation impact on engineering development** *Keynote speaker: Johan DECONINCK, Vrije Universiteit Brussel (VUB) BELGIUM*

Wednesday, 22nd of May

11^{30} – 13^{00}

ORAL SESSION 1 ROOM: ATENA

Distribution Systems and Dispersed Generation

Session Chairs: Mihai GAVRILAS,
Vasilis CHATZIATHANASSIOU

013 **Improving Performance Standards and Reducing Technical Loss by Mounting of Electrical Energy Storage Batteries Connected to 0,4kV-20kV Lines**
*Ioan RUSU**

113 **Energy Efficiency Evaluation Method of Low and Medium Voltage Distribution Systems to Industrial Consumers**
*Mihaela A COROIU**

121 **Single-Phase Auto-Reclose Automation in Medium Voltage Network**
Adrian TROFINOV, Marcel ISTRATE, Catalin SUFLETEL*

123 **Simulating the Mobile Network Behavior by Applying DTN in one Simulator of The Use Case of a Real Town Communication**
Blerina ZANAJ, Majlinda BELEGU, Amarildo RISTA, Elma ZANAJ*

158 **Reliability and Continuity Indicators Estimation in System of Electrical Power Supply to The Consumer**
Catalin MIHAI, Elena HELEREA*

179 **Solution for Reducing Technological Consumption in Low Voltage Distribution Network**
Valentin VILCU Mihai CENUSA, Mihaela POIENAR*, Dumitru CERNUSCA*

Wednesday, 22nd of May

11^{30} – 13^{00}

ORAL SESSION 2 ROOM: VIENA

Analysis, Modelling, Simulation and Optimal Design in Power Systems

Session Chairs: Johan DECONINCK, Marius PURCAR

034 **Method of Parameters Determination for Multi-Winding Transformer Equivalent Circuit in the form of Multi-Beam Star.**
*V.M. SUSLOV, Valeriu BOSNEAGA**

036 **Investigation of the Possibilities of Increasing the Frequency Converter Efficiency based on the Phase-Sift Transformer**
Lev CALININ, D.A. ZAITSEV, Mihai TIRSU, Irina GOLUB*

059 **Whales Optimization Algorithm based Enhanced Power Controller for an Autonomous Microgrid System**
Sajid QAZI, Muhammad Aslam UQAILI, Umbrin SULTANA*

094 **Analysis of the Necessity of Installing Flexible AC Transmission Devices in the National Electricity System in the Context of the Power Increase in the Dobrogea Area**
Remus Nicusor DINCULESCU, Alexandra CONSTANTIN, Anamaria IAMANDI, Mihai MARCOLT*

185 **Numeric Simulator for Analysis of Transient Produced by Faults in Electric Network**
Dumitru TOADER, Constantin BLAJ, Daniela VESA, Ildiko TATAI, Beatrice ARVINTI*

190 **The Analytical Method of Calculating the Transient Process in the Circuit's with Distributed and Concentrated Parameters**
Vladimir Petru BERZAN, Vladimir PATSYUK, Galina RYBACOVA, Radu PORUMB, Petru POSTOLACHE*

Wednesday, 22nd of May

14^{00} – 15^{00}

POSTER SESSION 1 ROOM: FOAYER

Distribution Systems and Dispersed Generation

Session Chairs: Sorin PAVEL, Dan D. MICU, Virgil MAIER, Dorin LUCACHE

054	**Case Study on the Implementation of Renewable Sources in the Medium Voltage Distribution Network** *Ciprian CIOBANU*, Marcel ISTRATE*
074	**Case Study of Transient Regimes in Distribution Network with Distributed Generators** *Ciprian CIOBANU*, Marcel ISTRATE*
084	**Economic Analysis of a Microgrid Considering Energy Markets** *Lucian Ioan DULAU*, Dorin BICA*
116	**Considerations about Fault Loop Impedance Measurement in TN Low-Voltage Network** *Liviu I. NEAMT*, Horia BALAN, Olivian CHIVER, Alexandru HOTEA*
122	**Artificial Intelligence Techniques for Fault Location and Detection in Distributed Generation Power Systems** *Cosmin DARAB*, Radu TIRNOVAN, Corina MARTINEAC, Antoniu TURCU*

Wednesday, 22nd of May

14^{00} – 15^{00}

POSTER SESSION 1 ROOM: FOAYER

Renewable energy

Session Chairs: Sorin PAVEL, Dan D. MICU, Virgil MAIER, Dorin LUCACHE

017 **Generating Waveforms for EMI Filters Testing**
Ionut V. IANCAU, Vasile Andrei GORGAN, Claudia CANDALE*

027 **Determination of Optimum Tilt Angle for Fixed Photovoltaic Modules in Iasi, Romania**
Roxana OPREA, Marcel ISTRATE, Dragos MACHIDON, Razvan BENIUGA*

028 **Analysis of V-Trough Reflector's Geometry Influence on Low Concentration Photovoltaic Systems**
*Roxana OPREA, Marcel ISTRATE, Dragos MACHIDON**

090 **Sorting System for E-Waste Recycling using Contour Visual Sensors**
Laszlo RAPOLTI, Rodica C HOLONEC, Romul COPANDEAN, Florin DRAGAN*

125 **Is There a Way to Become Prosumer? Promoting the Prosumer Concept in Romania**
Daniel-Cornel BALAN, Ilie VLASA*

186 **Assessment of Photovoltaic Modules' Parameters using the On-Site Measurements**
Ciprian-Mircea NEMES, Florin C. BAICEANU, Cosmin TIGANASU*

196 **Over Grid Connection of Non Dispatchable Utility Photovoltaic Power Plants in Romania**
Siviu STEFANESCU, Aurel BOTEZAN*

Wednesday, 22nd of May

14^{00} – 15^{00}

POSTER SESSION 1 ROOM: FOAYER

Smart Grids

Informatics and Telecommunications in Power Systems

Session Chairs: Sorin PAVEL, Dan D. MICU, Virgil MAIER, Dorin LUCACHE

012 **Software Redundancy Implementation Strategy in Reconfigurable Hardware Framework**
Razvan SINCA, Csaba SZASZ*

063 **Local Monitoring / Recording and Display Device, for Power Electricity Meter using IEC 62056-21**
Florin DRAGAN, Rodica C HOLONEC, Romul COPANDEAN*

078 **An Efficient Peer-To-Peer Based Blokchain Approach for Prosumers Energy Trading in Microgrids**
Bogdan Constantin NEAGU, Ovidiu P. IVANOV, Gheorghe GRIGORAS*

163 **Software-Defined Motor Control System in The Internet of Things Era**
Robin N. MOLNAR, Daniel DEACONU*

187 **Key Performance Indicators (KPIs) for the Evaluation of the Demand Response in The Technical University of Cluj-Napoca Buildings**
Mihaela CRETU, Andrei CECLAN, Levente CZUMBIL, Denisa STET, Bogdan BARGAUAN, Dan Doru MICU*

188 **Energy/Cost Efficiency Study on V2G Operating Mode for EVs and PHEVs**
Alexandru KRIUKOV, Mihai GAVRILAS*

Wednesday, 22nd of May

14^{00} – 15^{00}

POSTER SESSION 1 ROOM: FOAYER

Protection and Automation

Session Chairs: Sorin PAVEL, Dan D. MICU, Virgil MAIER, Dorin LUCACHE

016 **Advanced Techniques for Fault Detection and Classification in Electrical Power Transmission Systems: An Overview**
Radu TIRNOVAN, Maria CRISTEA*

055 **Estimation of Line Zero Sequence Impedance using Real Field Fault Data for Fault Location Application**
Marian DRAGOMIR, Marcel ISTRATE, Alin DRAGOMIR, Dragos MACHIDON, Anamaria IAMANDI*

068 **The Effect of Corrosion on Electrical Contacts**
Mihai PAUNESCU, Florin DRAGAN, Dan Doru MICU, Vasile TOPA*

097 **Reliability of Protection Schemes used for Multi-Terminal Transmission Lines**
Anamaria IAMANDI, Stelian ILIESCU, Ionela IONESCU, Marian DRAGOMIR, Alin DRAGOMIR*

099 **Assessment of DFIG Wind Turbine Overvoltage Protection System for Grid Stability**
Razvan BENIUGA, Oana BENIUGA, Dragos MACHIDON*

154 **Temperature Monitoring System in Automated Circuit Breakers**
Mihai PAUNESCU, Dan Doru MICU, Florin DRAGAN, Vasile TOPA*

175 **Hardware and Software Solution for the Electronic Equipment in the process of Extracting Methane Gas from the Coal Deposit**
Andras Emil SERGIU, Teodor PANA*

Wednesday, 22nd of May

14^{00} – 15^{00}

POSTER SESSION 1 ROOM: FOAYER

High Voltage Equipment and Materials

Electricity Markets and Regulation

Session Chairs: Sorin PAVEL, Dan D. MICU, Virgil MAIER, Dorin LUCACHE

026 **Temperature Logger for Electrical Equipment's Thermal Stress Monitoring**
Alin DRAGOMIR, Maricel ADAM, Mihai ANDRUSCA, Cosmin Nistor DEAC, Anamaria IAMANDI*

032 **Aspects Regarding the Electromagnetic Pattern for the Operating Mechanism of a Medium Voltage Circuit Breaker**
Marian-Bogdan MICU, Maricel ADAM, Mihai ANDRUSCA, Cosmin Nistor DEAC*

041 **Aspects Regarding Contact Resistance Measurement**
Cosmin Nistor DEAC, Maricel ADAM, Mihai ANDRUSCA, Alin DRAGOMIR*

143 **Urban Energy Management from Concept to Action and Results**
*Andrei CECLAN**

152 **Analysis of the Wholesale Energy Market Price in Romania and Its Impact on the End Customer**
Marius BOLBA, Radu A. MUNTEANU, Dan IUDEAN, Alexandru CRETU*

153 **Utilizing Short-Term Load Forecasts in the Assessment of Demand Response Programs**
Ioannis PANAPAKIDIS, Aggelos BOUHOURAS, Georgios C. CHRISTOFORIDIS*

Wednesday, 22nd of May

14^{00} – 15^{00}

POSTER SESSION 1 ROOM: FOAYER

Overhead Lines, Insulated Cables and Substations

Education in Electrical and Power Engineering

Session Chairs: Sorin PAVEL, Dan D. MICU, Virgil MAIER, Dorin LUCACHE

061 **Thermal Simulation of a Power Transformer**
*Ioan L. DIODIU, Lizeta POPESCU**

071 **Case Study on the Protection of Power Stations Against Lightning Strokes**
Anca - Teona S. SOLOMON, Marcel ISTRATE, Dragos MACHIDON*

076 **Considerations about Substation Grounding System Design**
Liviu I. NEAMT, Horia BALAN, Olivian CHIVER, Alexandru HOTEA*

098 **Wind Farms Behaviour At Power Grid Voltage Dips**
Razvan BENIUGA, Oana BENIUGA, Marcel ISTRATE*

170 **Contributions to Monitoring the Condition of Substations**
Dumitru SACERDOTIANU, Florica LAZARESCU, Iulian HUREZEANU, Ancuta-Mihaela ACIU, Marcel NICOLA, Ion PURCARU, Anca ALBITA*

182 **Substation Lightning Protection - Case Study**
Corina MARTINEAC, Cosmin DARAB*

191 **Influence of Soil Resistivity on Substations Earth Grounding System**
Corina MARTINEAC, Rini Nur HASANAH*

Wednesday, 22nd of May

14^{00} – 15^{00}

POSTER SESSION 1 ROOM: FOAYER

Education in Electrical and Power Engineering

Session Chairs: Sorin PAVEL, Dan D. MICU, Virgil MAIER, Dorin LUCACHE

064 **Adaptive ORCAD Simulation Approach in Teaching Non Linear Devices**
Laura DARABANT, Ovidiu A. POP, Cristina VATAVU*

070 **Implementation of an App for Android Mobile Devices Designed for Electromagnetic Field Problems Solving**
Claudia CONSTANTINESCU, Lucia MADAS, Laura GRINDEI, Adina GIURGIUMAN*

101 **Lighting System of a Commercial Space in an Energy Efficiency Approach**
Georgiana A. MORARU, Liviu Eduard PUNGARU, Marcel ISTRATE*

106 **A Solution for Studying the D.C. Motor Control using Ni Myrio-1900**
Gabriela RATA, Ciprian BEJENAR, Mihai RATA*

107 **Flexible System for Practical, Hands-On Power Electronics Teaching**
Petre TEODOSESCU, Norbert SZEKELY, Mircea BOJAN*

140 **Power Analysis Tools Developed in the Labview Programing Environment**
Calin MURESAN, Bogdan TEBREAN, Romul COPANDEAN, Madalin Ionut ARDELEAN, Florin DRAGAN*

172 **Electric Locomotive Laboratory Stand for Research and Educational Purposes**
*Gabriel CHIRIAC, Costica NITUCA, Daniel STICEA**

Wednesday, 22nd of May

15^{00} – 16^{30}

ORAL SESSION 3 ROOM: ATENA

Transmission System Operation, Control and Development

Session Chairs: Gianfranco CHICCO, Carmen STANESCU

053 **Requirements of a Real Time Monitoring and Analysis System of Power Losses in Electrical Transmission and Distribution Systems**
Constantin MOLDOVEANU, Irene M. IONITA, Sorin Dan GRIGORESCU, Virgil BREZOIANU, Alexandru TAVA, Sorin ZAHARESCU*

062 **UAV Development and Impact in the Power System**
Alexandra CONSTANTIN, Remus Nicusor DINCULESCU*

073 **Specific Parameters for Power Plants Connection to National Power System**
Elena Daniela DINU, Doina ILISIU*

081 **Impact in the Power System Following the Replacement of HVAC with HVDC Lines in Dobrogea Area**
Alexandra CONSTANTIN, Remus Nicusor DINCULESCU*

133 **Achieving Interoperability of Power System Protection using SCADA and PMU Information**
Hariss NICORESCU, Mihaela M. ALBU, Mircea EREMIA*

138 **Optimizing Solutions for Bus Bar Protection from ETN 220 - 400 kV**
*Valentin VILCU**

Wednesday, 22nd of May

15^{00} – 16^{30}

ORAL SESSION 4 ROOM: VIENA

Electric Machines and Drives;

HVDC and Power Electronics

Session Chairs: Lorand SZABO, Sorin GRIGORESCU

110 **Fault Analysis of a High Voltage Direct Current Link using Detailed Equivalent Models for Modular Multilevel Converters**
Ionut Catalin DAMIAN, Mircea EREMIA, Mihai SANDULEAC*

149 **Three Winding Transformers for Smart Power Substations**
*Gino CELENTANO, Davide LAURIA, Luigi Pio di NOIA, Renato RIZZO**

166 **Delay Compensation in the PMSM Control by using a Smith Predictor**
Marcel NICOLA, Claudiu-Ionel NICOLA, Marian DUTA*

167 **Sensorless Control of Multi-Motors BLDC using Back-EMF Observer**
Marcel NICOLA, Claudiu-Ionel NICOLA, Dumitru SACERDOTIAN*

192 **Electrical Machines used in Electric Power Steering Applications**
Lorand SZABO, Zsolt MATHE, Andreea Madalina NICORICI*

193 **Electric Vehicle Carbon Footprint Reduction via Intelligent Charging Strategies**
Indrateja VADIUM, Ridoy DAS, Ghanim PUTRUS, Yue WANG, Richard KOTTER*

Wednesday, 22nd of May

17^{00} – 18^{30}

ORAL SESSION 5 ROOM: ATENA

Smart Grids

Session Chairs: Mircea CHINDRIS, Renato RIZZO

021 **Development of an Automated System to Optimize Greenhouse Resource Consumption**
Sorin Iulian COSMAN, Cristina Adina MOLDOVAN, Rares IUSAN, Claudiu OPREA, Claudia MARTIS*

025 **Energy Efficiency and Power Quality Indicators of a Smart Grid. Case Study: Lighting Systems**
Cristian GHEORGHIU, Stefan GHEORGHE, Scripcariu MIRCEA, Radu PORUMB*

031 **Integrating the Industrial Consumer into the Smart Grid by Load Curve Forecasting using Machine Learning**
Stefan UNGUREANU, Vasile TOPA, Andrei CZIKER*

043 **A Scheduling Optimization Model of Electric Water Heaters for Electricity Cost Minimization with Limited Information**
Sara BARJA-MARTINEZ, Pol OLIVELLA-ROSELL, Pau LLORET-GALLEGO, Roberto VILLAFÁFILA-ROBLES, Andreas SUMPER, Stig Ødegaard OTTESEN, Hoang Minh TRAN*

060 **Digitalization of Resource Consumption on the Basis of Innovative Devices of Demand Side Management in Smart Grids**
Irina KLAVSUTS, Dmitry KLAVSUTS, Anastasia RUSINA, Marina KHAYRULLINA*

164 **Methodology for the Sizing of a Hybrid Energy Storage System in Low Voltage Distribution Grids**
Francesc GIRBAU-LLISTUELLA, Francisco DÍAZ-GONZÁLES, Andreas SUMPER, Mònica ARAGÜÉS-PEÑALABA, Luisa CANDIDO, Ramón GALLART-FERNÁNDEZ*

Wednesday, 22nd of May

17^{00} – 18^{30}

ORAL SESSION 6 ROOM: VIENA

Electricity Markets and Regulation;

Education in Electrical and Power Engineering

Session Chairs: Anthony WARD, Alexis POLYCARPOU

015 **Graduate Skills for the Power Engineering Sector: On the Match Between Supply and Demand.**
*Anthony WARD**

037 **Energy Efficiency Holistic Approach for New Energy Business Model Towards 2030**
*Mihaela COROIU**

049 **Diagnostic and Input Selection Tool applied on Weather Variables for Studies of Short-Term Load Forecasting**
Leonardo N. F. Da SILVA, Alzenira ABAIDE, Vinicius NEGRI, Marcelo CAPELETTI, Lucas Foggiato LOPES, Gabriel CARDOSO*

058 **Analysis of the Price Coupling Mechanism in The Day Ahead Electricity Markets**
Pavel ATANASOAE, Radu Dumitru PENTIUC, Eugen HOPULELE, Iulian Constantin AILOAE, Cosmin Florin IRIMIA*

095 **Challenges of Non-Formal Methods in Electrical Engineering Education**
Cristina VATAVU, Laura DARABANT*

144 **Monitoring the Cost of Energy for Powering the Railway Electric Traction System**
Alexandru POPOV, Ionel LEPADAT, Elena HELEREA, Vlad COJANU, Aurel FRATU*

Thursday, 23rd of May

09^{00} – 10^{00}

POSTER SESSION 2 ROOM: FOAYER

Transmission System Operation, Control and Development

Session Chairs: Dragos NICULAE, Claudia PACURAR, Florin CIUPRINA, Dumitru TOADER

045 **Automatic Control Systems in the Deep Oil Processing Industry**
*Amarildo RISTA, Elma ZANAJ, Blerina ZANAJ**

198 **Passage of the Balancing Market to Settlement at 15 minutes**
Ciprian DIACONU, Florin RADOI*

199 **SCADA Upgrade Solution for Romanian Substation**
Mihai BUDAN, Radu IONECI, Gabriel TANASESCU*

200 **Live Working Management – a Romanian Perspective**
Marius OLTEAN, Valentin ZAHARESCU

201 **Technological Upgrade of the Alba Iulia 220kV/110kV/20kV Substation Considerations about Fault Loop Impedance Measurement in TN Low-Voltage Network**
Aurora MORARU, Valentin ZAHARESCU, Florin MIRESCU*

Thursday, 23rd of May

09^{00} – 10^{00}

POSTER SESSION 2 ROOM: FOAYER

Analysis, Modelling, Simulation and Optimal Design in Power Systems

Session Chairs: Dragos NICULAE, Claudia PACURAR, Florin CIUPRINA, Dumitru TOADER

011 **Transient Phenomena and Failures Analysis in Redundant Power Converters**
*Csaba SZASZ, Razvan SINCA**

019 **Analysis over the Waveforms of the Electromagnetic Actuators. Adaptive-Delta Modulation**
Vasile Andrei GORGAN, Ionut V IANCAU, Claudia CANDALE*

024 **Energy Demand Curve Modeling with Machine Learning Algorithms**
Andrei IOANES, Radu TIRNOVAN*

048 **A Machine Learning Approach for Nilm Based on Odd Harmonic Current Vectors**
Eleftherios P. LOUKAS, Klajdi BODURRI, Panagiotis EVANGELOPOULOS, Aggelos BOUHOURAS, Ioannis PANAPAKIDIS, Konstantinos Ch. CHATZISAVVAS, Nikolaos POULAKIS, Georgios C. CHRISTOFORIDIS*

056 **Optimization of A Power Line Communications Network For Smart Metering System**
Ilie VLASA, Adrian GLIGOR, Cristian Dragos I. DUMITRU, Daniel-Cornel BALAN*

066 **Energy Management on Water Supply Systems**
Liviu Eduard PUNGARU, Georgiana A. MORARU, Marcel ISTRATE*

067 **Numerical Modeling and Parametric Analysis of Induction Plates**
Claudia CONSTANTINESCU, Calin MUNTEANU, Claudia PACURAR, Adina GIURGIUMAN, Sergiu Iulian ANDREICA, Marian Razvan GLIGA*

Thursday, 23rd of May

09^{00} – 10^{00}

POSTER SESSION 2 ROOM: FOAYER

Analysis, Modelling, Simulation and Optimal Design in Power Systems

Session Chairs: Dragos NICULAE, Claudia PACURAR, Florin CIUPRINA, Dumitru TOADER

077 **Variable High Frequency Power Inverter Used in Wireless Power Transfer**
Bogdan IUGA, Radu TIRNOVAN*

079 **An Efficient Approach for Flattening the Electricity Consumption Profile At Small And Medium Enterprises**
Gheorghe GRIGORAS, Bogdan Constantin NEAGU, Ovidiu P IVANOV*

088 **New Modalities in Computing The "Abc-Aβ" and "Aβ-Abc" Coordinates Transformations using Hilbert Transform**
Gheorghe TODORAN, Rodica HOLONEC, Romul COPANDEAN, Florin DRAGAN*

091 **Numerical Modeling and Parametric Analysis of a Switched Reluctance Motor**
Marian Razvan GLIGA, Calin MUNTEANU, Sergiu Iulian ANDREICA, Claudia PACURAR, Claudia CONSTANTINESCU, Adina GIURGIUMAN, Ioan POP*

093 **High Frequency Analysis of Bandpass Filters**
Adina GIURGIUMAN, Calin MUNTEANU, Claudia PACURAR, Claudia CONSTANTINESCU, Marian Razvan GLIGA, Sergiu Iulian ANDREICA*

114 **The Construction of a Wireless Power Supply System using Planar Spiral Inductors**
Claudia PACURAR, Vasile TOPA, Adina GIURGIUMAN, Calin MUNTEANU, Claudia CONSTANTINESCU, Marian Razvan GLIGA, Sergiu Iulian ANDREICA*

Thursday, 23rd of May

09^{00} – 10^{00}

POSTER SESSION 2 ROOM: FOAYER

Analysis, Modelling, Simulation and Optimal Design in Power Systems

Session Chairs: Dragos NICULAE, Claudia PACURAR,

Florin CIUPRINA, Dumitru TOADER

141 **Labview Program for Implementing Hilbert Spaces Algorithms in Power Systems Analysis**
Calin MURESAN, Bogdan TEBREAN, Madalin Ionut ARDELEAN, Septimiu CRISAN*

147 **Simulation of a Boost Converter for the Automotive Industry**
Ovidiu Catalin BLIDAR, Radu A. MUNTEANU, Dan IUDEAN, Mircea RUBA, Gheorghe NISTOR*

150 **Research on the Realization of a Electromechanical Pressure Micropump used in Electrical Equipment**
Dumitru CERNUSA, Dan Laurențiu MILICI, Radu Dumitru PENTIUC, Cezar POPA, Vasile Eusebiu TOADER*

176 **Study on Illuminance Class Selection in Street Lighting Design**
Alexandru Viorel RUSU, Dorin Dumitru LUCACHE, Catalin Daniel GALATANU, Gheorghe LIVINT*

177 **Energy Storage Applications And Challenges**
Yosef ELIA, Dorin Dumitru LUCACHE, Elena SEREA*

178 **Lifetime Availability Analysis Of High Voltage Circuit Breakers For Maintenance Optimization**
C. MIHALCEA, Florin MUNTEANU, Florin BAICEANU, Ciprian-Mircea NEMES*

181 **Extended Finite Element Method Connected With Multi-Objective Optimization Algorithm Used In 3D Electromagnetic Problems**
Raluca OGLEJAN, Bogdan MOCIRAN*

Thursday, 23rd of May

09^{00} – 10^{00}

POSTER SESSION 2 ROOM: FOAYER

Electromagnetics

Analysis, Modelling, Simulation and Optimal Design in Power Systems

Session Chairs: Dragos NICULAE, Claudia PACURAR,

Florin CIUPRINA, Dumitru TOADER

044 **Automated 3D Scanner for Electromagnetic Radiation Assessment Near the WPT Active Part**
*Calin PETRASCU, Vasile TOPA, Adrian V. TULBURE**

065 **Comparative Determinations of Magnetic Induction in AC and DC Circuits**
Ioan DIODIU, Lizeta POPESCU*

109 **Noise and Vibration Analysis of an In-Wheel Motor with Integrated Magnetic Gear Dedicated for Light Electric Application**
Claudia Violeta POP, Daniel FODOREAN, C. HUSAR, C. IRIMIA*

136 **Determining the Response of a Mechanical Shock Transducer Based on a Hall Effect Sensor**
Bogdan TEBREAN, Septimiu CRISAN, Calin MURESAN, Titus CRISAN*

194 **A Simplified Model for Approximating the Vias in the Thermo-Mechanical Simulation of Metal-Oxide Semiconductor Structures**
Adrian BOJITA, Marius PURCAR, Vasile TOPA, Calin MUNTEANU*

197 **EOG Based Controll of a Graphical Interface System for Assisting Paraplegic Patients**
Mihai MUNTEANU, Alina MAGDA, Rozica MOGA, Radu CIORAP*

Thursday, 23rd of May

09^{00} – 10^{00}

POSTER SESSION 2 ROOM: FOAYER

Electromagnetic Compatibility, Power Quality and Environmental Impacts

Session Chairs: Dragos NICULAE, Claudia PACURAR, Florin CIUPRINA, Dumitru TOADER

023 **Knowledge-Based System for The Analysis of Voltage Fluctuation And Flicker**
Anca MIRON, Andrei CZIKER, Hadrian BOGARIU*

029 **Wireless Power Transmission – State of the Art And Applications**
Muresan ANDREI, Brad CLAUDIU, Ioan VADAN*

042 **Interferences in High Voltage AC Power Line and Electric Railway Common Right-Of-Way**
Stefan F. BRAICU, Levente CZUMBIL, Denisa STET, Dan Doru MICU, Andrei CECLAN, Alexis POLYCARPOU, Emil SIMION*

083 **Electromagnetic Field Radiation Generated by Pulsed Non-Thermal Plasma Discharge**
Oana BENIUGA, Iuliana-Delicia DÎRLAU, Dragos ASTANEI, Radu BURLICA*

092 **The Calculation of "F" Factor And Evaluation Of Radiation Emitted by UV Lamps**
Pop FLAVIU, Calin MUNTEANU, Adina GIURGIUMAN, Silvan PRUSU, Alina POP*

096 **Analysis of Coexistence Conditions Between An Overhead Electricity Lines And A Dwelling House**
Ilie-Nicolae SUCALA, Dorina SUCALA*

117 **EMC Study for Different Types of Lamps with the Same Luminous Flux**
Sergiu Iulian ANDREICA, Calin MUNTEANU, Marian Razvan GLIGA, Adina GIURGIUMAN, Claudia CONSTANTINESCU, Lucian BUTNAR, Claudia PACURAR*

Thursday, 23rd of May

09^{00} – 10^{00}

POSTER SESSION 2 ROOM: FOAYER

Electromagnetics, Electromagnetic Compatibility

Electric Machines and Drives

Session Chairs: Dragos NICULAE, Claudia PACURAR,

Florin CIUPRINA, Dumitru TOADER

038 **Performance Evaluation of the Three-Phase Induction Operating in Conditions of Unbalanced Voltage Supply**
Sorin DELEANU, Greg Von LIPINSKI, Mihai IORDACHE, Marilena STANCULESCU, Dragos NICULAE*

082 **Evaluating the Performances of Electric Waveforms Analysis Relying on The Stationary Wavelet Transform**
Ileana-Diana NICOLAE, Petre-Marian NICOLAE, Cristina Diana MARINESCU, Radu Florin MARINESCU*

112 **Aspects on Harmonics Analytical Identification of a Periodic, Non-Sinusoidal Wave**
Virgil MAIER, Sorin PAVEL, Horia G BELEIU, Vasile FARCAS*

155 **Management System for the Control of the Forklifts Activity in a Factory**
Sergiu Dan PATA, Dan Laurentiu MILICI, Mihaela POIENAR, Mihai CENUSA*

156 **Modeling and Simulation of First-Order Li-Ion Battery Cell with Experimental Validation**
Raul NEMES, Sorina CIORNEI, Mircea RUBA, Horia HEDESIU, Claudia MARTIS*

180 **Comparison of the Electromagnetic Performances of Rare Earth-Less Outer Rotor Electrical Machines**
Razvan Alexandru INTE, Dan-Cristian POPA, Florin Nicolae JURCA, Claudia MARTIS*

183 **Influence of Multi-Pulse Rectifier on Power Quality in an Industrial Environment**
Florin C. BAICEANU, Florin MUNTEANU, Ciprian-Mircea NEMES*

Thursday, 23rd of May

09^{00} – 10^{00}

POSTER SESSION 2 ROOM: FOAYER

Electric Machines and Drives

HVDC and Power Electronics

Session Chairs: Dragos NICULAE, Claudia PACURAR, Florin CIUPRINA, Dumitru TOADER

052 **Contactless Excitation System with Rotary Transformer for Hydro-Generators**
Muresan ANDREI, Ioan VADAN, Madalin ARDELEAN*

072 **Design Analysis of an Axial-Flux Permanent Magnet Synchronous Machine for Railway Traction Application**
Marius DRANCA, Mihai CHIRCA, Stefan BREBAN, Marius FARTAN*

085 **Energy Efficiency Evaluation of HV Power Supplies for Non-Thermal Plasma Generation**
*Daniel CRETU, Radu BURLICA, Dragos ASTANEI, Iuliana-Delicia DÎRLAU, Oana BENIUGA**

135 **Design Analysis of a Toroidal Transformer for Traction Application**
Mihai CHIRCA, Marius Alexandru DRANCA, Dan Cristian POPA, Stefan BREBAN, Mihai IUSEP*

165 **Step by Step Limiting for Capacitors Inrush Current Used In Voltage Power Supplies**
Bogdan IUGA, Radu Adrian TIRNOVAN*

173 **Comparative Study A Two Adaptive Observers of Speed and Rotor Flux Of The Induction Motor**
Alexandru GOGEA, Olimpiu STOICUTA, Teodor PANA, Alexandru PARAMON*

174 **Comparative Analysis Between the Pi Speed Controller and Two-Degrees-Of-Freedom Speed Controller for Induction Motor Drive**
Alexandru GOGEA, Olimpiu O STOICUTA, Teodor PANA*

Thursday, 23rd of May

10^{00} – 11^{30}

ROOM: ATENA

Plenary Session 2

10^{00} – 10^{45}	**Concepts and tools to categorize and exploit the electrical demand** *Keynote speaker: Gianfranco CHICCO, Politecnico di Torino, ITALY*
10^{45} – 11^{30}	**Novel Electric Generator Topologies for Micro-Wind Power Applications** *Keynote speaker: Mircea M. RADULESCU, Technical University of Cluj-Napoca, ROMANIA*

Thursday, 23rd of May

$12^{00} – 13^{30}$

ORAL SESSION 7 ROOM: ATENA

Electromagnetics, Electromagnetic Compatibility

Power Quality and Environmental Impacts

Session Chairs: Mihai IORDACHE, Andrei MARINESCU

057 **Complex Power Quality Analysis of Electric Waveforms Affected by Noise**
Ileana-Diana NICOLAE, Petre-Marian NICOLAE, Radu Florin MARINESCU, Ali Qays ABDULAH*

089 **A Numerical Analysis of the Harmonic Impedance in a Medium Voltage AC Network**
Adrian PANA, Alexandru BALOI, Florin MOLNAR-MATEI*

124 **Water Exposure and Thermal Aging Effects on Dielectric Response of Liquid Silicone Rubber Insulators**
*Laura ANDREI, Florin CIUPRINA**

128 **Comparative WLAN Exposure Analysis: Weighted Channel Power Method Versus CCDF Method**
*Andrei Cristian BECHET, Robert HELBET, Simona MICLAUS, Iulian BOULEANU, Annamaria SARBU, Paul BECHET**

159 **Calculation of Electromagnetic Field Produced by Mixed Overhead Power Lines**
Karolina KASAS-LAZETIC, Gorana MIJATOVIC, Dejana HERCEG, Nikola DJURIC, Miroslav PRSA*

169 **On Circuit Analysis and Simulation of Networks with Nullors**
Razvan ASANACHE, Mihai IORDACHE, Dragos NICULAE, Marilena STANCULESCU, Maria - Lavinia BOBARU, Victor BUCATA, Sorin DELEANU*

Thursday, 23rd of May

12^00 – 13^30

ORAL SESSION 8 ROOM: VIENA

Renewable energy

Session Chairs: Constantin BULAC, Gheorghe GRIGORAS

100 **Short-Term Generation Forecasting Against the High Penetration of the Wind Energy**
Bruno Knevitz HAMMERSCHMITT, Alzenira ABAIDE, Leonardo N. F. Da SILVA, Felipe LUCCHESE, Júlio Affonso Dall Agnol ROHR*

129 **Monitoring Solar Panels using Machine Learning Techniques**
*Cristian-Gyozo HABA**

132 **Electromobility and Climate Change**
*Nicolae GOLOVANOV, Andrei MARINESCU**

134 **Prosumers Optimally Adapted to Local Load. Rationale and Benefits for the Grid**
*Mihai SANDULEAC, Mihaela ALBU, Dorel STANESCU, Carmen STANESCU**

148 **Analysis of Integration of PV Power Plant in Railway Power Systems**
*Luigi Pio Di NOIA, Renato RIZZO**

195 **Statistical Analysis on Wind Variability Impact on Environment**
George SERITAN, Sorin GRIGORESCU, Marco PAGANO*

Thursday, 23rd of May

$14^{30} – 18^{30}$

ROUND TABLE 1 ROOM: ATENA

Organizers:

CNTEE Transelectrica SA

CIGRE - Romanian National Committee

Romanian Academy – Power Systems Committee

Modern Technologies in Power System Networks

Session Chairs: Constantin BULAC, Ioan HATEGAN

1	**HVDC Back-to-Back transmissions systems** *Siemens AG*
2	**Flexible AC Transmission Systems** *Ralph Morgenstern Siemens AG*
3	**FISMEP - Innovative solution for power grid management and operation** *Mihai Sarb, Energobit SA*
4	**Digital Transformation in Transelectrica TSO** *Catalin Lisman, Transelectrica SA*
5	**Impact of large RES on system development** *Ciprian Diaconu, Transelectrica SA*
6	**Improvements of Power Transformer Condition Monitoring and Diagnosis Techniques – A Romanian Experience** *Constantin Moldoveanu, Nova Industrial SA*
7	**The involvement of Transelectrica TSO in Research and Development Project with European Funding** *Mihai Marcolt, Transelectrica SA*

Thursday, 23rd of May

$14^{30} – 18^{30}$

ROUND TABLE 2 ROOM: VIENA

Organizers:

ACER – Romanian EMC Association

NUMELEC Research Laboratory, Technical University Cluj-Napoca

Romanian EMC Chapter

Actual Trends in Electromagnetic Compatibility

Session Chairs: Andrei MARINESCU, Calin MUNTEANU

1	**New Magnetic Field Qualification & Standards for EV Wireless Power Transfer** *Andrei Marinescu, ACER*
2	**NUMELEC Research Laboratory – an Overview** *Calin Munteanu, TUCN*
3	**EMC Solutions in NUMELEC Laboratory** *Sergiu Andreica, Razvan Gliga. Adina Giurgiuman, TUCN*
4	**Recent Developments in Wireless Power Transfer** *Claudia Pacurar, Claudia Constantinescu, TUCN*

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