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DEPARTAMENTUL
ELTH
ELECTROTEHNICA

International Symposium on Fundamentals of Electrical Engineering

NUST POLITEHNICA Bucharest, Romania, November 16–18, 2023



BRIEF PROGRAMME

Thursday, November 16, 2023

- 8³⁰ - 9³⁰ **Registration** (UPB Library, entrance)
- 9³⁰ - 10⁰⁰ **Opening Session** (UPB Library, ROOM 3.1, 3rd floor)
- 10⁰⁰ - 10¹⁵ **Coffee Break** (UPB Library)
- 14¹⁵ - 12⁰⁰ **Oral Sessions** (UPB Library 3rd, 4th floors)
- 10¹⁵ - 12³⁰ **ASTR Round Table** - presentation of “Analysis of dynamic processes in high power synchronous machines” by Prof. Aurel Câmpeanu and discussions about “The quality of electric energy”, moderators: Prof dr Nicolae Golovanov, Prof. dr. Ioan Florea Hăntîlă (ASTR)
(UPB Library, ROOM 3.1, 3rd floor)
- 10¹⁵ - 12⁰⁰ (UPB Library, ROOM 3.2, 3rd floor)
- 10¹⁵ - 12⁰⁰ (UPB Library, ROOM 4.2, 4th floor)
- 11⁵⁵ - 13⁰⁰ **Smart Innovative Maintenance and Repair in Solar Energy – acronim SIM – RISE** - Dissemination of project activities and results, in collaboration with ICPE-CA
(UPB Library, ROOM 3.1)
- 13⁰⁰ - 14⁰⁰ **Lunch** (UPB Library)
- 14⁰⁰ - 16⁰⁰ **Oral Sessions** (UPB Library 3rd, 4th floors)
- 14⁰⁰ - 16⁰⁰ (UPB Library, ROOM 3.1, 3rd floor)
- 14⁰⁰ - 16⁰⁰ (UPB Library, ROOM 3.2, 3rd floor)
- 14⁰⁰ - 16⁰⁰ (UPB Library, ROOM 4.2, 4th floor)
- 16⁰⁰ - 16¹⁵ **Coffee Break** (UPB Library)
- 16¹⁵ - 18⁰⁰ **Oral Sessions** (UPB Library 3, 4 floors)
- 16¹⁵ - 18⁰⁰ (UPB Library, ROOM 3.1, 3rd floor)
- 16¹⁵ - 18⁰⁰ (UPB Library, ROOM 3.2, 3rd floor)
- 16¹⁵ - 18⁰⁰ (UPB Library, ROOM 4.2, 4th floor)
- 18⁰⁰ - 21⁰⁰ **Gala dinner** (UPB Library)



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Friday, November 17, 2023

- 8³⁰ - 9⁰⁰ **Registration** (UPB Library, entrance)
- 9⁰⁰ - 9¹⁵ **Coffee Break** (UPB Library, 3rd floor)
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- 9¹⁵ - 12⁰⁰ (UPB Library, ROOM 3.1, 3rd floor)
- 9¹⁵ - 12⁰⁰ (UPB Library, ROOM 3.2, 3rd floor)
- 9¹⁵ - 12⁰⁰ (UPB Library, ROOM 4.2, 4th floor)
- 12⁰⁰ - 14⁰⁰ **Lunch** (UPB Library)
- 14⁰⁰ - 14³⁰ **Closing Session and Concluding Remarks**



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PROGRAMME TIMELINE

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10¹⁵ – 12⁰⁰ (UPB Library, ROOM 3.2, 3rd floor)

Power electronics

Chairs: Gabriela Ciuprina, Norbert Seliger

693 Sinan Zengin

Triangular Current Modulations of DAB DC/DC Converter for Connecting PV Modules to DC Grid Considering Partial Shading

694 Nassim Zemirline, Nadir Kabeche, Samir Moulahoum

Artificial neural network-based averaging controller for circulating current elimination in a modular multilevel converter

715 Norbert Seliger, Johannes Honsa

Time-variable Mutual Inductance for Enhanced Inductive Power Transmission

717 Julio Espinosa Dominguez, Orly Ernesto Torres Breffe, Ioan Serban, Caridad Baserio González, Cesar Revuelta Capablanca

The Impact of Electric Arc Furnaces on the Cuban Power System: Existing Approaches and Future Prospects

732 Lemya DJAFER, Rachid TALEB, Alla Eddine TOUBAL MAAMAR, Fayçal MEHEDI

Implementation of SHEPWM based on Particle Swarm Optimization in a Two-Level Three-phase Inverter using dSPACE DS1104 Controller Board

10¹⁵ – 12⁰⁰ (UPB Library, ROOM 4.2, 4th floor)

Electrical materials

Chairs: Laurentiu Dumitran, Gheorghe Paltanea

743 Valentin Mateev, Kristian Petkov, Iliana Marinova

Electromagnetic Modeling of a Probe for Scanning Microwave Microscopy

750 Ion-Cornel Mituletu, Deian-Dorel Ardeljan

Testing Setup and Method to Characterize High-Force Shape Memory Alloy Wires



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| 752 | Stefan Alex Vasiliu, Laurentiu Marius Dumitran, Cristian-Liviu Popescu, Alexandru Stanescu | Efficiency of Water Extraction in an Electrostatic Wire-Cylinder System |
| 760 | Gheorghe Paltanea, Veronica Manescu (Paltanea), Iosif-Vasile Nemoianu, Paul Minciunescu, Bogdan Varaticeanu, Lucian Demeter, Costel Paun, Horia Gavrilă | Water-cooled Free Rare-Earth Permanent Magnet Assisted Synchronous Reluctance Motor - design and practical implementation |
| 768 | KAMRAN Dawood, ALPEREN ÇAKIR, Semih Tursun | Copper vs. Aluminum Windings in Dry-Type Transformers: A Comprehensive Study of Losses, Size, and Technical Attributes |
| 769 | Costin Ifrim | MHD Induced Separation in Liquid Filled Gaps of Surface Mounted Permanent Magnet Rotors |

11⁵⁵ – 13⁰⁰ **Smart Innovative Maintenance and Repair in Solar Energy – acronym SIM – RISE** - Dissemination of project activities and results, in collaboration with ICPE-CA (UPB Library, ROOM 3.1, 3rd floor)

13⁰⁰ – 14⁰⁰ **Lunch** (UPB Library)

14⁰⁰ – 16⁰⁰ **Oral Sessions** (UPB Library 3rd, 4th floors)

14⁰⁰ – 16⁰⁰ (UPB Library, ROOM 3.1, 3rd floor)

Renewable energies

Chairs: Horia Andrei, Emil Cazacu

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| 344 | Vasilica Dandea, Stefania Galbau, Nicolae Asavei, Florina Scarlatache, Bogdan-Constantin Neagu, Gheorghe Grigoras | Assessing the Impact of Prosumers on the Low-Voltage Electrical Distribution Networks based on a Scenarios-based Methodology |
| 704 | Nicolae-Silviu Popa, Ovidiu Cristea, Mihaela-Greti Manea, Emilia-Daniela Năstase | Hydrometeorological buoy with real-time data transmission to M.H.D. |
| 710 | Ciprian Popa, Eduard-Alexandru ANDREI, Andrei-Darius DELIU, Hristache ISAC | Revolutionary offshore wind-powered system for supplying electricity to ships |
| 719 | Layth Tawfeeq Al-Bahrani, Hamid AbdulQader | Improvement of Load Frequency Control of Multi-Sources Power System based on PID Controller using Particle Swarm Optimization with Renewable Energy Sources |
| 733 | Livia Marica, Horia Andrei | A brief technical analysis of energy sector in Romania based on renewables sources |



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14⁰⁰ – 16⁰⁰ (UPB Library, ROOM 3.2, 3rd floor)

Electrical Machines

Chairs: Alexandru Mihail Morega, Tiberiu Tudorache

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| 722 | Tiberiu Tudorache, Mircea Crăciun | Transient Analysis of a Linear Induction Motor for Electromagnetic Launchers |
| 723 | Tiberiu Tudorache, Valeriu Bostan, Andrei Marinescu | Numerical Analysis of a Flexible Wireless High Power Charging System for Electric Vehicles |
| 744 | Kamran Dawood, Semih Tursun | Effects of Gap Length of a Step Lap joint on the No Load Losses of Transformers |
| 754 | Ioana Ionica, Alexandru Mihail Morega, Cristian Boboc | The analysis of the airgap and geometry for the calculation of the torque on a stepper motor |
| 766 | Ghenadie Terteza, Petru Todos, Ilie Nuca, Vadim Cazac | The fault working regimes of the six-phase symmetrically wound asynchronous motor |

14⁰⁰ – 16⁰⁰ (UPB Library, ROOM 4.2, 4th floor)

Circuit analysis

Chairs: Florin Constantinescu, Adelina Bordianu

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|-----|---|--|
| 701 | Ara Abdulsatar Assim, Aarno Pärssinen, Timo Rahkonen | Using Analog Complex Mixers for Low-IF Mixing |
| 731 | Claudiu Tufan, George Marian Vasilescu, Ioan Florea Hantila, Adelina Bordianu, Mihai Maricaru | A Faster Algorithm for Frequency Solving of Nonlinear Three-Phase Circuits |
| 763 | Snehashis Roy, Rahat Redwan, Sumaiya Zaman, Md. Toufiqueel Haque Toha, Eftkher Shahrier Mozumder, Satyendra Nath Biswas | LP 8T SRAM: Design of New Technique SRAM with Reduced Power Consumption |

16⁰⁰ – 16¹⁵ **Coffee Break** (UPB Library)

16¹⁵ – 18⁰⁰ **Oral Sessions** (UPB Library 3rd, 4th floors)

16¹⁵ – 18⁰⁰ (UPB Library, ROOM 3.1, 3rd floor)

Power Engineering

Chairs: Girts Stana, Gabriela Iosif

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|-----|--|--|
| 713 | Girts Stana, Viesturs Brazis, Kaspars Kroics | Efficiency Comparison of Discharge Strategies of Mobile Supercapacitor Energy Storage System for Public Electric Transport |
| 714 | Girts Stana, Viesturs Brazis | Theoretical and Practical Study of the Effect of DC Grid Wire Temperature Variation on Transmission Losses |
| 729 | Tahmidur Rahman Tamim, Syed Saad Aslam, Fardin Sohail, Ashik Ahmed, Hasan Jamil Apon, Shadman Abid | Optimum Arrangement of Biogas-Integrated Distributed Generation Systems |



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- 742 Alexandru-Ionel Constantin, Ramona-Nicoleta Banaseanu, Paula Anghelita, Gabriela Iosif, Dorian Marin Thermal Images based Mobile Application for Identifying Faults in Photovoltaics Modules

16¹⁵ – 18⁰⁰ (UPB Library, ROOM 3.2, 3rd floor)

Education in Electrical Engineering

Chairs: Aurel-Ionuț Chirilă, Viorel Petre

- 747 Cerasela CĂMUI (DINU), Liviu Popescu, Viorel Petre, George Constantin Software Tools for Signal and Data Analysis Using LabView Platform
- 761 Breno Elias Bretas Carvalho, André Abelardo Tavares, Franciele Peruchi Ronchi, Leonardo Mariano Kunen A Gamification Software to Aid Students to Perform Better at Exams
- 764 Corina-Ioana Gheorghiu, Adelina-Maria Cîrstoiu, Ioan-Dragoș Deaconu, Valentin Năvrăpescu, Aurel-Ionuț Chirilă Modelling of Linear Coils using Arduino Platform

16¹⁵ – 18⁰⁰ (UPB Library, ROOM 4.2, 4th floor)

Electromagnetics

Chairs: Alexandru Radulian, Adelina Bordianu

- 728 Andrei Enghes, Adelina Bordianu, Emil Cazacu Analysis of the electric field strength emitted by wireless devices operating at 868.3 MHz in the vicinity of the human body
- 739 Bhargav Appasani, Amitkumar V. Jha, Sunil Kumar Mishra, Deepak Kumar Gupta, Mihai Oproescu, Nicu Bizon A Novel Computational Approach for Estimating the Side Lobe Peaks in Non-Uniformly Spaced Linear Antenna Arrays
- 718 Lavinia-Eugenia Ferariu, Ioana Axinte Enhanced Loss Function for the Design of Image Transform Models
- 730 Iancu Ciocoi, Adelina Bordianu, Gheorghe Samoilescu Electromagnetic Radiation Study on board Ships
- 757 Claudia-Olimpia Stasac, Mircea-Nicolae Arion Modeling of the Inductive Heating Process of a Cylindrical Part at two Different Frequencies, in Order to Optimize a Process of Joining an Assembly of Parts Made of Different Materials
- 765 Iliana Marinova, Miglenna Todorova, Valentin Mateev Modeling of Static Force Characteristic of a Bistable Permanent Magnet Actuator

18⁰⁰ – 21⁰⁰ Gala dinner (UPB Library)



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Automation and Biomedical Engineering

Chairs: Felix Adochiei, Marian Vasliescu

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|-----|---|--|
| 695 | Claudia Irina Săvescu, Constantin Daniel Comeagă, Mihaela Roman, Daniel Lale, Remus Mihai Stoica, Eduard Vasile | Experimental Study of a Piezoelectric Harvester Vibrating on an Industrial Screw Compressor |
| 702 | Andrei Mitru, Mihaela Roman, Cora Cotescu | Contributions on Developing Automation Software for Supervision and Command of a Screw Electro-Compressor Control Room |
| 724 | Andrei Mitru, Claudia Săvescu, Mihaela Roman, Mirela Vasile, Cora Cotescu, Eduard Vasile | Contributions on Data Communication and Software Developing for the Automation of an Industrial Piston Compressor |
| 738 | Ovidiu Marius Neamtu | An Estimate of the Operating Time of a Li-Ion Battery for Supplying a Three-Phase Power Converter with a Dynamic Random Load |
| 737 | Felix Adochiei | Determination of Cognitive-Emotional Characteristics through the Method of Individual Asymmetries of Power Spectral Density of EEG Waves |
| 759 | Laurentiu-Alex Mustata, Laura-Mihaela Lelutiu, Daniela-Livia Balan, Elena Helerea | Inclusivity in Electronic Communication: A Morse Code Interface for Visual and Auditory Deficiencies |

9¹⁵ - 12⁰⁰ (UPB Library, ROOM 3.2, 3rd floor)

Renewable energies

Chairs: Alexandru Gheorghe, Fiță Nicolae Daniel

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| 758 | Mihai S Tirsu, Mihail L Lupu, Ion Rudei | Dimensioning a Photovoltaic System Based on the Coverage of Own Electricity Consumption |
| 712 | Fiță Nicolae Daniel, Sorin Mihai Radu, Marius Daniel Marcu | Security risk assessment of electricity supply at 220/110/20 kV Sardanesti power substation from Romania |
| 725 | B. Al Igeb, M. Al-Kaabi, P. Oshchepkov, M. Muhssin, And A. Abdulazeez | Grey Wolf Optimizer Algorithm to Solve Optimal Placement and Sizing of the Distributed Generation Sources in Distribution Radial Networks |
| 708 | Nicolae-Silviu POPA, Ovidiu CRISTEA, Ciprian POPA, Vlad MOCANU, Alexandru-Ion DINU | The study on the implementation of high-power photovoltaic systems on military platforms |



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9¹⁵ – 12⁰⁰ (UPB Library, ROOM 4.2, 4th floor)

Digital Processing

Chairs: Lucian Petrescu, Iuliana Marin

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| 705 | Fotache Vasile, Stoichescu Dan
Alexandru | Implementation of Dijkstra and Floyd-Warshall Algorithms in Dynamic Dimensioning and 3D Geospatial Positioning Wireless Sensor Networks |
| 736 | Yusuf Fazil Goc, Ozgur Ergul, Berrin Celik, Mahmut Emin Celik | The Improvement of Model Performance for Automated Tooth Identification |
| 740 | Amitkumar V. Jha, Bhargav Appasani, Wriddhi Bhowmik, Deepak Kumar Gupta, Mihai Oproescu, Nicu Bizon | A Novel Energy-Efficient and Scalable Clustering-Based Routing Protocol for 3D Under Water Wireless Sensor Network |
| 749 | Ana-Maria COMEAGĂ, Iuliana Marin | Memory Management Strategies for an Internet of Things System |
| 756 | Ovidiu Postelnicu, Dragos Bordescu, Emil Cazacu, Lucian Petrescu | Novel Application of Hurst Exponent and Fractal Analysis for Predictive Maintenance in Electric generators |

12⁰⁰ - 14⁰⁰ Lunch (UPB Library)

14⁰⁰ - 14³⁰ Closing Session and Concluding Remarks