

SAEM'2022 – Preliminary Symposium Programme

MONDAY, 27th June 2022, 9:30-10:00

Opening Ceremony

Chairs: Lidija Petkovska, Andrzej Krawczyk and Bojan Štumberger

MONDAY, 27th June 2022, 10:00-10:45

Keynote Lecture – KL- 1

Chair: Maria Evelina Mognaschi

3894 **State-of-the-Art of Electromagnetic Medicine**

*Andrzej Krawczyk*¹ and Ewa Korzeniewska²

¹Polish Society of Applied Electromagnetics, ²Lodz University of Technology, Poland

10:45-11:15 – COFFEE BREAK

MONDAY, 27th June 2022, 11:15-13:15

Session 1 - Bioelectromagnetics (BIO)

Chair: Andrzej Krawczyk

1558 **Modelling of Temperature Distribution in Anatomically Correct Female Breast Cancer**

*Arkadiusz Miaskowski*¹ and Piort Gas²

¹University of Life Sciences in Lublin, ²AGH University of Science and Technology, Krakow, Poland

572 **Influence of Cell Density and Extra-Cellular Matrix on Electric Field Distribution in Electroporation**

Paolo Di Barba, Maria Evelina Mognaschi and Elisabetta Sieni

University of Pavia, Italy

6621 **Is the Uterus of Sexually Immature Lambs Sensitive to the Action of the Electromagnetic Field?**

Anna Koziarowska, Maria Romerowicz-Misielak, Katarzyna Koziol, Weronika Wilczak and Marek Koziarowski

University of Rzeszow, Poland

3038 **The Key Enzymes of Steroidogenesis and the Steroid Hormone Receptors in the Testes of Male Roe Deer Can Be Sensitive on the Influence of Electromagnetic Fields**

Marek Koziarowski, Katarzyna Koziol, Maria Romerowicz-Misielak, Wiktoria Czyż, Camilla Adamska and Anna Koziarowska

University of Rzeszow, Poland

8862 **Optimization of Multiple Neural Networks in 3D Process Electrical Tomography**

*Tomasz Rymarczyk*¹, *Grzegorz Kłósowski*² and *Konrad Niderla*¹

¹Netrix S.A. & University of Economics and Innovation in Lublin, ²Lublin University of Technology, Poland

MONDAY, 27th June 2022, 13:15-14:45 – LUNCH

15:15-23:00 – Guided walking city tour of Struga, Bus transfer and visit Kalishta Monastery, Visit to Vevchani village, Dinner at Kutmichevica National Restaurant

TUESDAY, 28th June 2022, 8:30-10:00
Session 2 - Electrical Machines and Drives (EMD)
Chair: Mykhaylo Zagirnyak

- 7595 **Assumptions of the Electrical Drive Unit for Commercial Vehicles**
Bartłomiej Będkowski, Piotr Dukalski, Łukasz Cyganik and Tomasz Jarek
Łukasiewicz Research Network – Institute of Electrical Drives and Machines – KOMEL,
Poland
- 5358 **Electric Drive Motors for Heavy Duty Vehicles: Good Practice in Selection and Design**
Emil Król and Marcin Maciążek
Sieć Badawcza Łukasiewicz - Instytut Napędów i Maszyn Elektrycznych KOMEL,
Politechnika Śląska, Poland
- 2867 **Determination of the Small-Scale Physical Model Approach for the Simulation of Ship Propulsion and Hydrokinetic Energy Recovery**
Željko Hederić, Tin Benšić and Marko Cuković
Faculty of Electrical Engineering, Computer Science and Information Technology,
Croatia
- 707 **Materials Testing of Copper Alloy Rotors at Squirrel Cage Induction Motors**
Zdravko Praunseis, Miralem Hadžiselimović, Iztok Brinovar and Klemen Srpčič
University of Maribor, Faculty of Energy Technology, Slovenia
- 5193 **Energy Efficiency Improvement of Electric Pump Drive System**
Mihail Digalovski and Goga Cvetkovski
Ss. Cyril and Methodius University, Faculty of Electrical Engineering and Information
Technology, North Macedonia

TUESDAY, 28th June 2022, 10:00-10:45
Keynote Lecture – KL-2
Chair: Bojan Štumberger

- 3024 **Cutting-Edge Technology for Innovative Electric Motors**
Lidija Petkovska and Goga Cvetkovski
Ss. Cyril and Methodius University, Faculty of Electrical Engineering and Information
Technology, North Macedonia

10:45-11:15 – COFFEE BREAK

TUESDAY, 28th June 2022, 11:15-13:15
Session 3 - Shape Design and Optimisation of Electromagnetic Devices (OPT)
Chair: Željko Hederić

- 2909 **Design of Interior Permanent Magnet Synchronous Motor for Energy-Efficient Electric Propulsion System**
Bojan Štumberger, Iztok Brinovar, Klemen Sredenšek, Miralem Hadžiselimović, Sebastijan Seme, Amor Chowdhury and Gregor Srpčič
University of Maribor, Faculty of Energy Technology, Slovenia
- 8384 **Optimising Stator Design of a Single Phase PM BLDC Motor for Improved Cogging Torque Profile**
Lidija Petkovska¹, Goga Cvetkovski¹ and Paul Lefley²
¹Ss. Cyril and Methodius University, Faculty of Electrical Engineering and Information
Technology, North Macedonia
²University of Leicester, United Kingdom
- 519 **Weight Optimization of Axial Flux Permanent Magnet Machine**

- Franjo Pranjić and Peter Vrtič*
University of Maribor, Faculty of Energy Technology, Slovenia
- 3275 **Efficiency Improvement of Permanent Magnet Motor Using Swarm Intelligence Algorithms**
Goga Cvetkovski and Lidija Petkovska
Ss. Cyril and Methodius University, Faculty of Electrical Engineering and Information Technology, North Macedonia
- 5710 **Efficiency and Power Capability Maximization of Interior Permanent Magnet Synchronous Motors with Ferrite Permanent Magnets**
Bojan Štumberger, Iztok Brinovar, Klemen Sredenšek, Miralem Hadziselimović, Sebastijan Seme, Amor Chowdhury and Gregor Srpčič
University of Maribor, Faculty of Energy Technology, Slovenia
- 892 **PM-Synrm Rotor Design and Optimization with Multi Objective Differential Evolution for Better Torque and Torque Ripple Performance**
Gregor Srpčič, Bojan Štumberger, Miralem Hadziselimović, Sebastijan Seme, Iztok Brinovar and Klemen Sredenšek
University of Maribor, Faculty of Energy Technology, Slovenia

13:15-14:45 – LUNCH

TUESDAY, 28th June 2022, 14:45-15:30

Keynote Lecture – KL-3

Chair: Lidija Petkovska

- 541 **Configuration of a photovoltaic system based on the physical, geographical, technical and economic potential**
Sebastijan Seme, Primož Mavsar and Klemen Sredenšek
University of Maribor, Faculty of Energy Technology, Slovenia

TUESDAY, 28th June 2022, 15:30-16:30

Session 4 - Renewable Energy Systems (RES)

Chair: Peter Vrtič

- 5486 **Analysis of Intensive Use of Renewable Sources and Hydrogen Technologies in the SAŠA Region**
Jurij Avsec, Urška Novosel and Brigita Ferčec
University of Maribor, Faculty of Energy Technology, Slovenia
- 3612 **Analysis of the Country's Energy Efficiency**
Janusz Sowiński
Czestochowa University of Technology, Poland
- 1342 **Implementation of Different Types of Photovoltaics on Greenhouses: A Case Study**
Angela Najdoska and Goga Cvetkovski
Ss. Cyril and Methodius University, Faculty of Electrical Engineering and Information Technology, North Macedonia

16:30-17:00 – COFFEE BREAK

TUESDAY, 28th June 2022, 17:00-19:00

Session 5 - Power Energy Systems (PES-1)

Chair: Sebastijan Seme

- 3936 **Optimal Power Injection Placement in Radial Distribution Systems Using Clustering Optimization**

- Angela Popova, *Jovica Vuletić, Jordančo Angelov and Mirko Todorovski*
Ss. Cyril and Methodius University, Faculty of Electrical Engineering and Information
Technology, North Macedonia
- 9624 **Principal Design of Single-Phase HV Shunt Reactors**
Mislav Trbušić, Marko Jesenik and Anton Hamler
University of Maribor, Slovenia
- 4044 **Flexibility Assessment of the Macedonian Power System: A High-Level Screening
Method for the Future Flexibility Needs**
Stojan Malcheski, Sime Kuzarevski, Jovica Vuletić, Mirko Todorovski and Jordančo Angelov
Ss. Cyril and Methodius University, Faculty of Electrical Engineering and Information
Technology, North Macedonia
- 6834 **Electromagnetic Coupling of Overhead High Voltage Transmission Lines to Pipelines in
Multilayer Soil: Parametric Analysis**
*Blagoja Markovski, Leonid Grcev, Vladimir Gjorgievski, Bodan Velkovski and Marija
Markovska-Dimitrovska*
Ss. Cyril and Methodius University, Faculty of Electrical Engineering and Information
Technology, North Macedonia
- 7169 **Smart Voltage Control and Direct Load Management**
Darko Vidinikj and Goga Cvetkovski
Ss. Cyril and Methodius University, Faculty of Electrical Engineering and Information
Technology, North Macedonia
- 3947 **Utilization of the Flexibility of Consumers in Power Systems by Implementation of
Demand-Side Management**
Katerina Bilbiloska, Aleksandra Krkoleva Mateska and Petar Krstevski
Ss. Cyril and Methodius University, Faculty of Electrical Engineering and Information
Technology, North Macedonia
- 7960 **Analyzing the Impact of Plug-In Hybrid Vehicles in Low-Voltage Distribution Systems
Using a Non-Deterministic Approach**
Evica Smilkoska, Vasko Zdraveski, Jovica Vuletić, Jordančo Angelov and Mirko Todorovski
Ss. Cyril and Methodius University, Faculty of Electrical Engineering and Information
Technology, North Macedonia

20:30-24:00 – Banquet Dinner, Hotel Drim

WEDNESDAY, 29th June 2022, 9:30-10:45

Session 6 - Power Energy Systems (PES-2)

Chair: Blagoja Markovski

- 8019 **Numerical Calculation of the Electrical and Magnetic Fields of the High Voltage Power
Distribution Network Insulator**
Željko Hederić and Venco Ćorluka
Faculty of Electrical Engineering, Computer Science and Information Technology, Croatia
- 1505 **Energy-Economics Calculation Modelling of Gas-Steam Combined Cycle Power Plant**
Dušan Strušnik¹, Marko Agrež² and Jurij Avsec¹
¹University of Maribor, ²Energetika Ljubljana d.o.o., Slovenia
- 267 **The Payment Concept for Ensuring Interoperability on Public Electric Charging
Infrastructure**
*Amor Chowdhury¹, Jože Hebar², Miralem Hadžiselimović¹, Bojan Štumberger¹, Sebastijan
Seme¹ and Dalibor Igrec¹*
¹University of Maribor, Faculty of Energy Technology, ²Elektro Maribor d.d., Slovenia
- 3015 **Assessment of Electric and Magnetic Field Exposure Near Overhead Transmission Lines
Using 2D Finite Elements Method**
Bojan Glushica, Blagoja Markovski, Andrijana Kuhar and Vesna Arnautovski-Toseva

10:45-11:15 – COFFEE BREAK

WEDNESDAY, 29th June 2022, 11:15-13:15

Session 7 - Coupled Problems and Applications (APP)

Chair: Goga Cvetkovski

- 9377 **Characteristics of the Dynamic Battery Model for Different Loads**
Venco Ćorluka¹, Željko Hederić¹ and Miralem Hadžiselimović²
¹Faculty of Electrical Engineering, Computer Science and Information Technology, Croatia
²University of Maribor, Faculty of Energy Technology, Slovenia
- 4736 **Advantages of the Modern Telecommunication Technologies**
Andrzej Krawczyk¹ and Ewa Korzeniewska²
¹Polish Society of Applied Electromagnetics, Poland
²Lodz University of Technology, Poland
- 9836 **The Energy Method for Identifying the Parameters of a Laboratory Electrohydraulic Complex**
Mykhaylo Zagirnyak, Viktoriya Kovalchuk and Tetyana Korenkova
Kremenchuk Mykhailo Ostrohradskyi National University, Ukraine
- 7628 **Experimental Validation and Parameter Estimation of Lithium Iron Phosphate Battery Using Thevenin Equivalent Circuit Model**
Klemen Sredenšek, Iztok Brinovar, Gregor Srpčič, Miralem Hadžiselimović, Bojan Štumberger, Amor Chowdhury and Sebastijan Seme
University of Maribor, Faculty of Energy Technology, Slovenia
- 7112 **Frequency Behaviour of Specific Total Loss Model Taking Into Account Anisotropy of Electrical Steel**
Wojciech Pluta, Marek Patro and Paweł Czaja
Czestochowa University of Technology, Poland
- 3292 **Measuring the Impact of High Order Harmonics on the Transformer No-Load Power Losses**
Mihail Digalovski, Goga Cvetkovski, Krste Najdenkoski and Goran Rafajlovski
Ss. Cyril and Methodius University, Faculty of Electrical Engineering and Information Technology, North Macedonia
- 1019 **Design and Fabrication of a Three-Phase Full-Wave Diode Rectifier with DC Voltage Stabilization**
Iztok Brinovar, Benjamin Božič, Gregor Srpčič, Klemen Sredenšek, Bojan Štumberger, Sebastijan Seme and Miralem Hadžiselimović
University of Maribor, Faculty of Energy Technology, Slovenia

WEDNESDAY, 29th June 2022, 13:15-13:30

Closing Session

Chairs: Lidija Petkovska, Andrzej Krawczyk and Bojan Štumberger

13:30-15:00 – Farewell Lunch