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2024 24th International Scientific Conference on

**ELECTRIC POWER
ENGINEERING (EPE)**

EPE
2024

Conference Schedule

Wednesday, May 15, 2024 – 1st conference day

- 10:00 – 13:00 Participant Registration – Room 400 (near reception)
- 11:30 – 13:00 Lunch – Hotel Restaurant
- 13:00 – 13:30 Conference opening – Restaurant Hall
- 13:30 – 14:30 Invited Lectures – Restaurant Hall
- 14:30 – 15:00 Coffee Break – Restaurant Hall
- 15:00 – 16:00 Invited Lectures – Restaurant Hall
- 16:30 – 18:00 Virtual reality - Transmission station – Room “Kavarna”
- 19:00 – 23:00 Gala dinner – Restaurant Hall + Restaurant
- 21:00 – 21:15 Light show – Restaurant Hall

Thursday, May 16, 2024 – 2nd conference day

- 07:00 – 08:00 Breakfast – Restaurant
- 08:00 – 08:30 Invited Lecture – Room 400
- 08:45 – 10:15 Session Electrotechnology I – Room 400
- 08:45 – 10:15 Session Electrical Engineering and Light I – Room 500
- 10:15 – 10:30 Coffee Break
- 10:30 – 12:00 Session Electrotechnology II – Room 400
- 10:30 – 12:00 Session Electrical Engineering and Light II – Room 500
- 12:00 – 13:30 Lunch – Restaurant
- 13:15 – (17:30) Tourist trip - Good shoes and clothes required (weather may change)
- 13:45 – (17:00) Excursion to Pumped-storage Power Plant Dlouhé Stráně I (English Guide)
- 14:45 – (18:00) Excursion to Pumped-storage Power Plant Dlouhé Stráně II (Czech Guide)
- 19:00 – 23:00 Social Evening – Restaurant Hall + Restaurant

Friday, May 17, 2024 – 3rd conference day

- 07:00 – 08:00 Breakfast – Restaurant
- 08:00 – 09:30 Session Power Plants I – Room 400
- 08:00 – 09:30 Session Electrical Networks I – Room 500
- 09:30 – 10:00 Coffee Break
- 10:00 – 11:30 Session Power Plants II – Room 400
- 10:00 – 11:30 Session Electrical Networks II – Room 500
- 11:30 – 12:30 Lunch – Restaurant

We would like to invite you also to the next conference **2025 25th International Scientific Conference on Electric Power Engineering (EPE)**, which will be organized by Czech Technical University in Prague on May, 2025, Czech Republic.

2024 24th International Scientific Conference on Electric Power Engineering (EPE)

Wednesday, May 15, 2024 - first day of the conference

Invited lectures (Restaurant Hall), 13:30–16:00

Guarantee: Radomír Goňo (VŠB - Technická univerzita Ostrava, CZ)



Libor Kozubík

IBM Czech Republic, spol. s r.o.

**The Potential of Quantum Computing in Electricity Grid
Calculation**

Filip Novák

ABB s.r.o.

ABB Operation center Europe – H2 Initiatives & Development

Tomáš Kolacia

EG.D, a.s.

**The impact of modern trends in electrical power engineering on
distributors**

Ondřej Mamula

CIRC, Czech Technical University in Prague

Stand-alone hybrid power plant for Ancillary services provision

2024 24th International Scientific Conference on Electric Power Engineering (EPE)

Thursday, May 16, 2024 - second day of the conference

Invited lecture (ROOM 400), 8:00–8:30

Guarantee: **Radomír Goňo** (VŠB - Technická univerzita Ostrava, CZ)



Matthias Manfred Vetter

Nuremberg Research Center, Huawei Technologies Duesseldorf GmbH

**Multi-Use Strategies for Behind-the-Meter and Front-of-the-Meter
Battery Storage Applications**

2024 24th International Scientific Conference on Electric Power Engineering (EPE)

Thursday, May 16, 2024 - second day of the conference

Session Electrotechnology I, II (ROOM 400), 08:45–12:00

Guarantee: **Petr Kačor** (VŠB - Technická univerzita Ostrava, CZ)

Chairpersons: **Vladimír Šály** (Slovenská technická univerzita v Bratislavě, SK) and **Alexandru Băloi** (Universitatea Politehnica Timișoara, RO)



Time	No	Authors	Title of paper
8:45 - 10:15	25	Roman Hrbac, Vaclav Kolar, Stanislav Kocman, Lukas Demel, Libor Hrdina, Kamil Slany	Analysis of Power Flows in a Building with Non-linear Loads and a Hybrid Photovoltaic Power Plant with Battery Storage
	15	Jozef Kudelcik, Stefan Hardon, Alexey Gunya	Dielectric Analysis of a Polyurethane Enhanced by MgO or AlN Particles for an Application in Chemical Power Module Case
	18	Jozef Bendik, Matej Cenky, Levent Racz, Balint Nemeth	Static Line Rating of Overhead Power Lines in Various European Countries
	23	Illia Lazarenko, Matej Cenky, Jozef Bendik	A Simplified Urban-Scale Rooftop Photovoltaic Potential Estimation
	26	Lukasz Rokicki, Mirosław Parol, Piotr Palka, Marcin Kopyt, Pawel Piotrowski	Real-Time Electrical Energy Balancing and Limiting the Peak Power Demand of an Industrial Facility Using a Multi-Agent System - Early Solutions of the DIEGO Project
	31	Alexandru Baloi, Adrian Pana, Florin Molnar-Matei, Damian Cerbu, Ionut Popa	LabVIEW Virtual Instrument for the Command of an Adaptive Balancing Capacitive Compensator
	34	Aleksandra Pluzek, Lukasz Nagi, Michal Koziol, Ondrej Kabot	Analysis of selected parameters of Midel 7131 ester with addition of aluminum oxide Al ₂ O ₃
10:15 - 10:30	Coffee break		
10:30 - 12:00	41	Zaneta Eleschova, Boris Cintula, Anton Belan, Matej Cenky, Jozef Bendik	Positive Impact of the OLTC Blocking on the Voltage Stability
	43	Juraj Packa, Vladimir Saly, Peter Cubon, Milan Perny	Influence of Water on Selected Dielectric Properties of Impregnants in the Cured State
	45	Zaneta Eleschova, Matus Ludva, Boris Cintula, Anton Belan, Matej Cenky, Jozef Bendik	Two-Winding Transformer in Symmetrical Components
	46	Johannes Buberger, Wolfgang Grupp, Tobias Hogerl, Andreas Wiedenmann, Julian Estaller, Thomas Weyh, Manuel Kuder	Optimizing Bidirectional AC Charging Efficiency of Multilevel Batteries: A Simulation Approach
	28	Conor Healy, John G. Hayes	An Efficiency Optimized Gear-Shift Map to Maximise the Performance of a Modular E-Axle
	48	Conor Healy, John G. Hayes	Speed Vectoring Algorithms for Drivelines with Multiple Modular E-Axles
	55	Nina Sorokina, Wolfgang Bliemetsrieder, Julian Estaller, Dominic Karnehm, Thomas Weyh, Manuel Kuder	Performance Analysis of Reconfigurable Inverter Battery Systems for Aircraft Applications

2024 24th International Scientific Conference on Electric Power Engineering (EPE)

Thursday, May 16, 2024 - second day of the conference

Session **Electrical Engineering and Light I, II** (ROOM 500), 08:45–12:00

Guarantee: **Tomáš Novák** (VŠB - Technická univerzita Ostrava, CZ)

Chairpersons: **Petr Toman** (Vysoké učení technické v Brně, CZ) and **Peter Janiga** (Slovenská technická univerzita v Bratislavě, SK)



Time	No	Authors	Title of paper
8:45 - 10:15	3	Pavel Cyprich, Petr Cyprich, Jan Strossa, Vladislav Damec, Ales Havel	Comparison of Hysteresis Current Control and VOC Control with SPWM and SVPWM applied to Vienna Rectifier
	4	Tomas Blodek, Pavel Vrtal, Tomas Kohout, Zdenek Svaty, Lubos Nouzovsky	Verification of Night Road Safety Inspection by Luminance Analysis
	7	Marek Kubatko, Stepan Kirschner, Vojtech Sotola, Kamal Hamani, Martin Kuchar	Sensorless induction motor drive based on reactive power MRAS estimator using artificial neural network
	17	Tadeas Holy	Mathematical Models of Multiphase Machines Based on Symmetrical Components Decomposition in Relation to Space Harmonics
	22	Michal Sahul, Peter Janiga	Optimization of ESD Protection Design for Assembly Lines of Headlights Through Risk Analysis
	49	Ali Aljazaeri, Petr Toman, Jan Klusacek	Modelling and Testing of Phasor Measurement Unit in PSCAD
	53	Ardian Hyseni, Dusan Medved, Jaroslav Petras	Benford's Law in Electric Power Engineering
10:15 - 10:30	Coffee break		
10:30 - 12:00	54	Obed Muhayimana, Mohammed Laamim, Ali Aljazaeri, Abdellilah Rochd, Petr Toman	Comparative Study Between Model-in-the-loop Offline and Real-time Simulations for Phasor Measurement Units
	56	Patrik Kucera, Hana Karnikova, Lenka Maierova	Use of Satellite Imagery to Identify Light Pollution Sources in Urban Structure – The Limits and the Benefits
	57	Peter Janiga, Jozef Bendik, Matej Cenky, Zanita Eleschova, Anton Belan, Boris Cintula, Juraj Packa	Operation of Public Lighting Networks at Voltage Lower than Nominal
	61	Jan Zbojovsky, Roman Cimbala, Peter Gabris	Analysis of dielectric parameters of XLPE insulation by impedance relaxation spectroscopy
	73	Vladimir Mostyn, Lubomir Ivanek, Petr Orsag, Stanislav Kocman, Stanislav Zajaczek, Karel Shee	Train Approach Detection System Based on Track Impedance Measurements
	74	Slavka Seckova, Florinda F. Martins, Frantisek Janicek, Miroslava Farkas Smitkova, Juraj Packa, Milan Perny	Heat Pump Performance Design for Heating System in the Building
	60	Maya Almansour, Jiri Drapela	Complementary Reactive Power Control of Three-phase AC/DC Voltage Source Converters for Grid Support Applications

2024 24th International Scientific Conference on Electric Power Engineering (EPE)

Friday, May 17, 2024 - third day of the conference

Session Power Plants I, II (ROOM 400), 08:00–11:30

Guarantee: **Jan Fulneček** (VŠB - Technická univerzita Ostrava, CZ)

Chairpersons: **Michał Kunicki** (Politechnika Opolska, PL) and **Dušan Medved'** (Technická univerzita v Košiciach, SK)



Time	No	Authors	Title of paper
8:00 - 9:30	9	Maksymilian Przygodzki, Rafal Gwozdz	Selected problems of modelling energy storage and renewable sources for long-term analyses
	10	Rafal Gwozdz, Maksymilian Przygodzki	Long-term analysis of development and demand for energy storage in Poland
	27	Michal Kunicki, Michal Koziol, Ireneusz Urbaniec, Jaroslaw Zygarlicki	Wavelet Selection for Analysis of Acoustic Signals Emitted by Partial Discharges in Oil Insulation
	30	Petr Cervenka, Jan Kruntorad	Optimizing the Operation of Portable Traffic Monitoring Devices Using Photovoltaic Panels for Sustainability and Efficiency
	39	Marek Hoger, Michal Bahernik	Stochastic Modeling of a Residential PV Plant Operation
	33	Jan Petrov, Libor Hrdina, Petr Moldrik, Radomir Gono	Diagnostic Methods of Photovoltaic Panels: Low-cost Electroluminescence
	36	Libor Hrdina, Petr Moldrik, Jan Petrov, Roman Hrbac, Tomas Mlcak, Mikolaj Bartlomiejczyk	The Importance of Heat Pumps and Cogeneration for the Transformation of the Energy Sector to Sustainable Sources
9:30 - 10:00	Coffee break		
10:00 - 11:30	44	Milan Perny, Vladimir Saly, Juraj Packa, Richard Klucha	Testing, Analysis and Diagnostics of Chosen Faults of Photovoltaic Systems
	62	Dusan Medved, Michal Kolcun, Jozef Kiraly, Frantisek Margita, Ardian Hyseni, Damian Mazur	Analysis of Electric Vehicle Charging Process
	64	Aneta Bednarova, Radomir Gono, Stanislav Rusek, Jan Sobotik	The Path to a Sustainable Power Production and Issues to Address
	65	Jan Sobotik, Zdenek Hradilek, Jan Fulnecek, Aneta Bednarova	Analysis of an off-grid system with photovoltaic panels
	71	Khuong Nguyen-Vinh, Saumith Gonapaladeniya, Nam Nguyen-Quang, Zbigniew Leonowicz	A review of Photovoltaic Technology
	72	Khuong Nguyen-Vinh, Nam Nguyen-Quang, Zbigniew Leonowicz, Tomas Novak, Radomir Gono, Ervin Racz	Comparing of Potential Energy From The Sun During A Year in Czechia and Vietnam
	78	Jan Fulnecek, Ondrej Kabot, Michal Kunicki, Lukasz Nagi	Medium Voltage Covered Conductors: Advantages, Disadvantages and High Impedance Faults

2024 24th International Scientific Conference on Electric Power Engineering (EPE)

Friday, May 17, 2024 - third day of the conference

Session Electrical Networks I, II (ROOM 500), 08:00–11:30

Guarantee: **Tomáš Mičák** (VŠB - Technická univerzita Ostrava, CZ)

Chairpersons: **Zbigniew Leonowicz** (Politechnika Wroclawska, PL) and **Michał Jasiński** (Politechnika Wroclawska, PL)



Time	No	Authors	Title of paper
8:00 - 9:30	2	Lechuan Piao, Fei Xue, Xiaoliang Wang, Qigang Wu, Shaofeng Lu, Bing Han	Active Planning of Flexible and Cohesive Virtual Microgrids
	6	Huilin Zhu, Ziqian Zhang, Lothar Fickert, Guochu Chen, Yongming Zhang, Robert Schuerhuber	Impedance Measurement and Stability Analysis Based on Grid-Connected Inverter in D-Q Domain
	8	Karolina Cechova, Jaroslava Orsagova	Monitoring Level of Residual Currents in Dispatch System by New Function Embedded in Regulator of Arc-suppression Coil
	13	Jiri Dvoracek, Jiri Drapela, Jan Moravek, Martin Vojtek, Petr Mastny	In-Field Compliance Testing of an Existing Photovoltaic Power Generating Module
	19	Krzysztof Solak, Waldemar Rebizant, Frank Mieske, Klaus Boehme	ANN Stabilization of Negative-Sequence Integral Protection of Power Transformers for Turn-to-Turn Winding Faults
	37	Stanislav Kratochvil, Stanislav Rusek	Power grid security: N-1 criterion and DACF model
	32	Karel Maslo, Stanislav Macejko, Tomas Haba	Grid Forming Inverter Models for Stability Studies
9:30 - 10:00	Coffee break		
10:00 - 11:30	50	Karel Maslo, Vaclav Gromnica	Power System Dynamic Model as a Digital Twin
	51	Michal Vrana, Martin Vojtek, Jiri Drapela, Martin Kaspirek	Transition of Inverter Generating Plants to Unintentional Island Operation in Part of the Distribution Network
	58	Miguel Kosmala Neto, Tomasz Okon, Kazimierz Wilkosz	Areas of Impact of Nodal Powers on Power Flows in a Power System
	59	Frantisek Margita, Lubomir Bena, Pawel Pijarski	Calculation of the ampacity of overhead power lines under the conditions of the electric power system of the Slovak Republic
	63	Matous Vrzala, Radomir Gono, Bretislav Stacho	Reliability improvement with automatic transition between grid-connected and islanded modes
	68	Tomas Mlcak, Roman Hrbac, Lukas Demel	Control of Outdoor Lighting Systems with Long-Distance Communication
	70	Tomas Gono, Lukas Vavra, Petr Krejci, Bretislav Stacho, Michal Jasinski	Harmonic Filter Design Methodology
76	Olena Rubanenko, Milan Belik, Jan Timr	Implementing European experiences of energy community strategy based on high utilisation of renewable energy sources to distributed power grids in Ukrainian conditions	

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