



CONFERENCE FINAL PROGRAM

(v7; 17 September 2019)

Notation: **Pz** – Plenary presentation: z – order of the plenary lecture
Lx.y-z – Lecture presentation: x – conference day, y – session in the day, z – order of the lecture
Dx.y-z – Dialogue presentation

Tuesday, 24 September 2019 Day 1

9:00 - 9:30		Opening Session: Introduction, EDPE History, Information	
9:30 – 10:00	P1	Modern Methods of Electric Power Quality Signals Analysis	Room K1
10:00 – 10:30	P4	Fault Tolerant Control of Induction Motor (change)	
10:30 – 11:00		Coffee Break	Corridor, Hall
11:00 – 12:20	L1.1	Fault Detection in Electrical Machines	Room K1
11:00 – 12:20	L1.2	Power Semiconductor Converters	Room K2
12:30 – 14:00		Lunch	Restaurant
14:00 – 15:30	D1.1	Control of Electrical Drives	Hall
(14:00...coffee)	D1.2	Power Semiconductor Converters	
	D1.3	Measurement and Signal Processing. Robotics	
18:30 – 21:30		Welcome Party	Restaurant
21:30 ...		After Party night swimming	Wellness

Wednesday, 25 September 2019 Day 2

8:30 – 9:30	D2.1	Electrical Machines	Hall
(9:00...coffee)	D2.2	Electrical Vehicles and Traction	
	D2.3	Batteries. Associated Topics	
9:30 – 10:50	L2.1	Observers and Estimators in Electrical Drives	Room K1
9:30 – 10:50	L2.2	Control of Electrical Drives	Room K2
11:00 – 11:30	P3	Electric Vehicles – Key to Energy Transition	Room K1
11:30 – 12:45		Lunch	Restaurant
12:45		Departure to conference trips & continuing discussion	Entrance

Thursday, 26 September 2019 Day 3

8:30 – 10:00	D3.1	Faults and Optimization of Electrical Machines	Hall
(9:30...coffee)	D3.2	Power Electronics	
10:00 – 11:20	L3.1	Design of Electrical Machines	Room K1
10:00 – 11:20	L3.2	Control of Power Converters	Room K2
11:30 – 12:00	P2	The State-of-The Art: DC-to-DC Converters for Fuel Cell Vehicular Power Train – Power Electronics in Fuel Cell Technology (change)	Room K1
12:00 – 12:30	P5	Energy Harvesting from Vibrations as Autonomous Source of Energy for Sensing and Monitoring	
12:30 – 13:00		Closing Session: Evaluation, Announcement of conferences PEMC 2020 (Gliwice), PEDG 2020 (Dubrovnik), EDPE 2021 (HR)	Room K1
13:00		Lunch, departure	Restaurant



Tuesday, 24 September 2019

Day 1

Opening Session

Tuesday, 24 September 2019, 09:00 – 09:30

Room K1

Opening and Instructions

Viliam Fedák, Technical University of Košice, Slovakia, Jadranko Matuško, University of Zagreb, Croatia

Plenary Lectures P1, P2

Tuesday, 24 September 2019, 9:30 – 10:30

Room K1

Chairs: Jiri Lettl, Czech Technical University in Prague, Czech Republic
Željko Jakopović, University of Zagreb, Croatia

P1 -----

Modern Methods of Electric Power Quality Signals Analysis

Vladimir Katić, University of Novi Sad, Serbia

P4 -----

Fault Tolerant Control of Induction Motor

Mateusz Dybkowski, Wrocław University of Science and Technology, Poland (change)

Session L1.1: Fault Detection in Electrical Machines

Tuesday, 24 September 2019, 11:00 – 12:20

Room K1

Chairs: Jan Bauer, Czech Technical University in Prague, Czech Republic
Mateusz Dybkowski, Wrocław University of Science and Technology, Poland

L1.1-1 ----- Paper ID: 63 -----

Simulation Finite Element based Investigation of the Static Eccentricity Fault Influence during the Induction Motor No-load Start-up

Virgiliu Fireteanu, Politehnica University of Bucharest, Romania

L1.1-2 ----- Paper ID: 48 -----

Application of Hybrid Neural Network to Detection of Induction Motor Electrical Faults

Maciej Skowron; Marcin Wolkiewicz; Czesław T. Kowalski; Teresa Orłowska-Kowalska, Wrocław University of Science and Technology, Poland

L1.1-3 ----- Paper ID: 81 -----

Investigation of Induction Machine with Rotor-Bar Faults

Ludek Schreier; Miroslav Chomat, Czech Academy of Sciences, Prague, Czech Republic

L1.1-4 ----- Paper ID: 62 -----

Detection and Localization of Electrical Faults in a Three Phase Synchronous Generator with Rectifier

Russell Sabir, TU Berlin and SEG Automotive; Daniele Rosato, SEG Automotive; Sven Hartmann, SEG Automotive Germany GmbH, Germany; Clemens Guehmann, Technische Universität Berlin, Germany

Session L1.2: Power Semiconductor Converters

Tuesday, 24 September 2019, 11:00 – 12:20

Room K2

Chairs: Valentin Oleschuk, Moldovan Academy of Sciences, Moldova
Marek Pástor, Technical University of Košice, Slovakia

L1.2-1 ----- Paper ID: 52 -----

Feasibility of High Frequency Zero-Voltage Switching Boost Converters Achieving High Power Density Using Wide-Bandgap

Piotr Zimoch; Kamil Kierepka; Marcin Kasprzak, Silesian University of Technology, Gliwice, Poland

L1.2-2 ----- Paper ID: 58 -----

Evaluation of Switching Performance of Si, SiC and GaN Power Transistors within ZVS Mode

Michal Frivaldsky; Michal Pipiska; Peter Sojka, University of Zilina, Slovakia

L1.2-3 ----- Paper ID: 12 -----

Zero-Current-Switching Buck Converter

Felix Himmelstoss; Michael Jungmayer, Technikum Wien, Austria

L1.2-4 ----- Paper ID: 53 -----

Design and Functional Demonstration of a 100 A Battery Testing Unit with Minimal Power Supply Load

Thomas Winkler; Herbert Ziegerhofer, Montanuniversitaet Leoben, Austria

Poster Sessions D1

Tuesday, 24 September 2019, 14:00 – 15:30

Hall

Session D1.1: Control of Electrical Drives

D1.1-1 ----- Paper ID: 50 -----

A Fuzzy Approach to Optimal DC Motor Controller Design

Daniela Perdukova; Pavol Fedor; Viliam Fedak; Technical University of Košice, Slovakia

D1.1-2----- Paper ID: 39 -----

BLDC Motor Control with Cascade Structure Utilizing ARM MCU

Jiri Ctibor; Jan Knobloch; Pavel Vorel; Ivo Pazdera, Brno University of Technology, Czech Republic

D1.1-3 ----- Paper ID: 69 -----

Influence of the Stator Current Approximation Form on the Discrete Sliding Mode Torque Control for Induction Motor Drive

Grzegorz Tarchala, Wrocław University of Science and Technology, Poland

D1.1-4 ----- Paper ID: 36 -----

Simultaneous Estimation of the Stator and Rotor Resistances in an Induction Motor Drive Using Novel Active and Reactive Power Based Model Reference Adaptive System

Szymon Bednarz; Mateusz Dybkowski, Wrocław Univeristy of Science and Technology, Poland

D1.1-5 ----- Paper ID: 45 -----

Control Strategies for the Identification and Reduction of Cogging Torque in PM Motors

Martin Sumega; Pavol Rafajdus, University of Zilina, Slovakia;

Marek Stulrajter, NXP Semiconductors, Czech Republic; Giacomo Scelba, University of Catania, Italy

Session D1.2: Power Semiconductor Converters

D1.2-1 ----- Paper ID: 64 -----

High Efficiency DC-DC Buck Converter with a Passive Snubber Circuit

Jung-Ha Kim; Sang-Won Lee; Hyeon-Seok Lee; Sang-Hoon Lee; Yoon-Geol Choi; Bongkoo Kang Pohang University of Science and Technology, South Korea

D1.2-2 ----- Paper ID: 75 -----

A Novel Boost Converter with Two Independently Controlled Switches

Delia-Anca Botila, Ioana-Monica Pop-Calimanu, Dan Lascu, Politehnica University Timisoara, Romania

D1.2-3 ----- Paper ID: 24 -----

On the Operational Modes of LCC Resonant Converter with a Capacitive Output Filter

Yoram Horen, SCE; Svetlana Bronshtein, SCE; Dmitry Baimel, SCE - Shamoon College of Engineering, Israel; Alexander Abramovitz, Tel Aviv University, Israel

D1.2-4 ----- Paper ID: 65 -----

Line-interactive UPS as Shunt Active Power Filter

Ante Perić; Viktor Šunde; Željko Ban; University of Zagreb, Croatia

D1.2-5 ----- Paper ID: 26 -----

12 kW Flyback Converter with a Passive Quasi-resonant Snubber

Jan Martis; Pavel Vorel; Petr Prochazka, Brno University of Technology, Czech Republic

D1.2-6 ----- Paper ID: 5 -----

Fault Diagnosis for Multilevel Inverter with Space Vector Recognition

Rudolf Mecke, Harz University of Applied Sciences, Germany

D1.2-7 ----- Paper ID: 32 -----

Experimental DC/DC Converter for Photovoltaic Panel with Fully Digital Control Based on Flyback Topology with Nontraditional Snubber Circuit

Dušan Benda; Pavel Vorel, Brno University of Technology, Czech Republic

Session D1.3: Measurement and Signal Processing. Robotics

D1.3-1 ----- Paper ID: 84 -----

Statistical Parameters of the Measured Voltage in the Network

Milan Guzan; Adam Fehér; Tibor Vince, Technical University of Košice, Slovakia

D1.3-2 ----- Paper ID: 86 -----

Improvement of the Measurement Accuracy of Resistance Standard with UNI-T UT 805 and UT 803 Multimeters

Milan Guzan; Adam Fehér, Technical University of Košice, Slovakia

D1.3-3 ----- Paper ID: 73 -----

High Accurate Robotic Machining based on Absolute Part Measuring and On-line Path Compensation

Tomas Kubela; Ales Pochyly; Vladislav Singule, Brno University of Technology, Czech Republic

D1.3-4 ----- Paper ID: 76 -----

Skid Steering of Robotic Vehicle for Autonomous Applications

Róbert Üveges; František Ďurovský; Viliam Fedak, Technical University of Košice, Slovakia

Wednesday, 25 September 2019

Day 2

Poster Sessions D2

Wednesday, 25 September 2019, 8:30 – 9:30

Hall

Session D2.1: Electrical Machines

D2.1-1 ----- Paper ID: 82 -----

The Factors Affecting Positioning Accuracy of Geared Servodrives

Viktor Šlapák, Technical University of Košice, Slovakia; Michal Pajkos, Matus Hric, SPINEA Technologies, Slovakia

D2.1-2 ----- Paper ID: 54 -----

Stator Winding Faults investigation in Permanent Magnet Synchronous Motor using Motor Signatures: Part I

Adil Usman; Nikhil. T. Doiphode; Bharat S. Rajpurohit, Indian Institute of Technology, Mandi, India

D2.1-3 ----- Paper ID: 72 -----

Finite Element Modeling of Stator Winding Faults in Permanent Magnet Synchronous Motor: Part II

Adil Usman; Nikhil. T. Doiphode; Bharat S. Rajpurohit, Indian Institute of Technology, Mandi, India

D2.1-4 ----- Paper ID: 57 -----

Synchronous Reluctance Machines: Theory, Design and the Potential Use in Traction Applications

Branko Ban, ALTEN, Croatia; Stjepan Stipetic; Mario Klanac, University of Zagreb, Croatia

D2.1-5 ----- Paper ID: 17 -----
A Design of Neodymium Free Spoke-type Machine for High Power Density and Efficiency
Jungmoo Seo; Joochan Kim, Korea Electronics Technology Institute, Korea;
Jangho Seo, Kyungpook National University, Korea

Session D2.2: Electrical Vehicles and Traction

D2.2-1 ----- Paper ID: 7 -----
Sustainable Electromobility in the Liberec Region and in the Middle Europe in General
Josef Černohorský; Pavel Jandura; Klara Kuprova, Technical University of Liberec, Czech Republic

D2.2-2 ----- Paper ID: 18 -----
Pairing of Traction DC Motors, Long Term Experiences from Practice and Simulations
Jiří Kubín; Ales Richter, Technical University of Liberec, Czech Republic;
Želmíra Ferková, Technical University of Košice, Slovakia

D2.2-3 ----- Paper ID: 21 -----
Design of Rear Wheel Steering System of an Experimental Electric Vehicle
Lukáš Krčmář; Josef Břoušek; Tomáš Petr, Technical University of Liberec, Czech Republic

D2.2-4 ----- Paper ID: 20 -----
Locomotive Wheel Slip Controller based on Power Dissipation in Wheel-rail Contact
Petr Pichlík (Czech Technical University in Prague, Czech Republic)

Session D2.3: Batteries. Associated Topics

D2.3-1 ----- Paper ID: 40 -----
Modeling of Lithium-ion Battery Charging and Discharging Using the Preisach Hysteresis Model
Jakub Eichler; Miroslav Novak, Technical University of Liberec, Czech Republic

D2.3-2 ----- Paper ID: 22 -----
Identification of Li-ion Battery Model Parameters
Radoslav Cipin; Marek Toman; Petr Prochazka; Ivo Pazdera, Brno University of Technology, Czech Republic

D2.3-3 ----- Paper ID: 6 -----
Modeling and Analysis of a Fuzzy Type MPPT Algorithm
Jenica Ileana Corcau; Liviu Dinca, University of Craiova, Romania

D2.3-4 ----- Paper ID: 27 -----
Impact of External Low-dynamic Magnetic Field on Human Body with Metal Implants, Combination of Energy Conversation Principle and Maxwell Equations
Ales Richter, TU Liberec; Želmíra Ferková, Technical University of Košice, Slovakia;
Václav Bittner, Technical University of Liberec, Czech Republic

Session L2.1: Observers and Estimators in Electrical Drives

Wednesday, 25 September 2019, 9:30 – 10:50

Room K1

Chairs: Miroslav Chomát, Czech Academy of Sciences, Czech Republic
Jadranko Matuško, University of Zagreb, Croatia

L2.1-1 ----- Paper ID: 59 -----
Discrete Implementation of Sensorless IM Drive with MRAS-Type Speed Estimator
Mateusz Korzonek; Teresa Orłowska-Kowalska, Wrocław University of Science and Technology, Poland

L2.1-2 ----- Paper ID: 25 -----
Induction Motor Control with Respect to Maximum Efficiency in a Wide Range of Speed and Torque
Pavel Vorel; Marek Toman; Jan Martis, Brno University of Technology, Czech Republic

L2.1-3 ----- Paper ID: 34 -----
Reactive Power MRAS for Rotor Resistance Estimation Taking Into Account Load-Dependent Saturation of Induction Motor
Ondrej Lipcak; Jan Bauer; Miroslav Chomatm, Czech Technical University in Prague, Czech Republic

L2.1-4 ----- Paper ID: 55 -----
Analysis of Stability Improvement Method with Additional Feedback for Stator Current Error Based Speed Estimator MRASCC
Mateusz Korzonek; Teresa Orłowska-Kowalska, Wrocław University of Science and Technology, Poland

Session L2.2: Control of Electrical Drives

Wednesday, 25 September 2019, 9:30 – 10:50

Room K2

Chairs: Pavel Mindl, Czech Technical University in Prague, Czech Republic
Pavel Vorel, Brno University of Technology, Czech Republic

L2.2-1 ----- Paper ID: 70 -----
Successive Linearization Based Predictive Vehicle Torque Vectoring
Bojan Spahija; Marko Švec; Sandor Iles; Jadranko Matusko, University of Zagreb, Croatia

L2.2-2 ----- Paper ID: 74 -----
Control Architecture of a Remotely Controlled Vehicle in Extreme CBRNE Conditions
Ana Šelek; Demijan Jurić; Anđela Čirjak; Filip Marić; Marija Seder; Ivan Marković; Ivan Petrović, University of Zagreb, Croatia

L2.2-3 ----- Paper ID: 85 -----
Speed Sensorless Control of PMSM with Unscented Kalman Filter and Initial Rotor Alignment
Karol Kyslan; Viktor Šlapák; Viktor Petro; Adrián Marcinek; František Ďurovský, Technical University of Košice, Slovakia

L2.2-4 ----- Paper ID: 43 -----
Low Speed Operation of Sensorless Estimators for Induction Machines using Extended, Unscented and Cubature Kalman Filter Techniques
Krisztián Horváth, Széchenyi István University, Hungary; Dénes Fodor, University of Pannonia Veszprem, Hungary

Plenary Lecture P3

Wednesday, 25 September 2019, 11:00 – 11:30

Room K1

Chairs: Mariusz Stępień, Silesian University of Technology, Poland
Felix Himmelstoss, UAS Technikum Wien, Austria

P3 -----
Electric Vehicles – Key to Energy Transition
Pavol Bauer, Delft University of Technology, The Netherlands

Thursday, 26 September 2019

Day 3

Poster Sessions D3

Thursday, 26 September 2019, 8:30 – 10:00

Hall

D3.1: Faults and Optimisation of Electrical Machines

D3.1-1 ----- Paper ID: 49 -----
Induction Motor Optimised Supply Voltage and Frequency Control
Pavel Mindl; Zdeněk Čeřovský; Pavel Mňuk, Czech Technical University in Prague, Czech Republic

D3.1-3 ----- Paper ID: 41 -----
Identification of Induction Motor Parameters Considering Sensitivity Analysis of Measured Quantities
Pavel Vorel; Marek Toman; Radoslav Cipin; Petr Prochazka, Brno University of Technology, Czech Republic

D3.1-4 ----- Paper ID: 11 -----
Comparison of Two Types of Cooling of Axial Flux Permanent Magnet Machines by CFD Simulation
Lukas Veg, University of West Bohemia, Pilsen, Czech Republic

Session D3.2: Power Electronics

D3.2-1 ----- Paper ID: 35 -----
Educational Purpose Switch Mode Supplies
Martin Folprecht, Dalibor Červinka, Brno University of Technology, Czech Republic

D3.2-2 ----- Paper ID: 33 -----
Comparison of Thermal Properties of the Magnetic Components of Interleaved DC/DC Converters
Michal Frivaldsky; Slavomir Kascak; Michal Prazenica; Miroslav Pavelek; Miriam Jarabicova,
University of Zilina, Slovakia

D3.2-3 ----- Paper ID: 44 -----
Analysis of Power Transistor Switching Process
Petr Prochazka; Ivo Pazdera; Jan Miklas; Radoslav Cipin, Brno University of Technology, Czech Republic

D3.2-4 ----- Paper ID: 23 -----
GaN Transistors Cooling Options Comparison
Pavel Skarolek; Jiri Lettl, Czech Technical University in Prague, Czech Republic

D3.2-5 ----- Paper ID: 38 -----
Synchronous Adjustment of Modular Converter Based on Diode-Clamped Inverters with Multi-Zone PWM
Valentin Oleschuk, Vladimir Ermuratskij, Institute of Power Engineering of Moldova,
Marek Pástor, Technical University of Košice, Slovakia

D3.2-6 ----- Paper ID: 31 -----
Hardware Concept of a New BLDC Motor Controller Based on BCD Technology
Jan Knobloch; Jiří Ctibor; Pavel Vorel, Brno University of Technology, Czech Republic

D3.2-7 ----- Paper ID: 2 -----
Output Voltage Control of Soft-Switching DC-DC Converter
Marek Pástor, Jaroslava Žilková, Peter Girovský, Technical University of Košice, Slovakia

D3.2-8 ----- Paper ID: 83 -----
Soft-Switching DC-DC Converter with SiC Full-Bridge Rectifier
Marek Pástor; Jaroslav Dudrik; Andrea Vitkovská, Technical University of Košice, Slovakia

D3.2-9 ----- Paper ID: 14 -----
Comparison of Predictive Direct Power Control Methods for Grid-Connected Converter in B4 Configuration
Viktor Valouch, Czech Technical University, Prague, Czech Republic; Petr Šimek, Czech Academy of Sciences, Czech Republic

Session L3.1: Design of Electrical Machines

Thursday, 26 September 2019, 10:00 – 11:20

Room K1

Chairs: Czeslaw T. Kowalski, Wroclaw University of Science and Technology, Poland
Zbigniew Kaczmarczyk, Silesian University of Technology, Poland

L3.1-1 ----- Paper ID: 29 -----
Automated Preliminary Design of Induction Machines Aided by Artificial Neural Networks
Christian Altehheld; Raimund Gottkehaskamp, Hochschule Düsseldorf, Germany

L3.1-2 ----- Paper ID: 60 -----
Comparison of Ant Colony and Differential Evolution Optimization Methods Applied to a Design of Synchronous Reluctance Machine
Mario Klanac; Damir Zarko; Stjepan Stipetic, University of Zagreb, Croatia

L3.1-3 ----- Paper ID: 37 -----
Influence of Machine Geometry to the PMSM Mathematical Model
Jan Laksar; Karel Hruska; Lukas Veg, University of West Bohemia, Pilsen, Czech Republic

L3.1-4. (D3.1-2) ----- Paper ID: 42 -----
Brushless DC Motor Controller Optimization Using Simulated Annealing
Maad Shatnawi, Higher Colleges of Technology, Abu Dhabi, United Arab Emirates;
Ehab Bayoumi, Electronics Research Institute, Giza, Egypt

Session L3.2: Control of Power Converters

Thursday, 26 September 2019, 10:00 – 11:20

Room K2

Chairs: Michal Frivaldský, University of Zilina, Slovakia
Sanjeevikumar Padmanaban, Aalborg University, Denmark

L3.2-1 ----- Paper ID: 67 -----
Harmonic Analysis of Line Current of Industrial VSI-Fed Adjustable-Speed Drives
Filip Hleb; Martina Kutija, University of Zagreb, Croatia

L3.2-2 ----- Paper ID: 66 -----
Alternative Methods of Synchronous Space-Vector PWM for Transport-Oriented Converters and Drives
Valentin Oleschuk, Vladimir Ermuratskij, Institute of Power Engineering of Moldova;
Marek Pástor, Technical University of Košice, Slovakia

L3.2-3 ----- Paper ID: 51 -----
Cross-Period Single Phase Shift Control Technique for High Power and Low Frequency Dual Active Bridge Converters
Szabolcs Veréb; András Futó; Zoltán Sütő; Attila Blogh; István Varjasi,
Budapest University of Technology and Economics, Hungary

L3.2-4 ----- Paper ID: 13 -----
Cascaded Delayed Signal Cancellation Based Pre-Filtering Technique to Improve Frequency Locked Loop for Grid Synchronization
Petr Šimek; Viktor Valouch, Czech Academy of Sciences, Czech Republic

Plenary Lectures P4, P5

Thursday, 26 September 2019, 11:30 – 12:30

Room K1

Chairs: Teresa Orłowska-Kowalska, Wrocław University of Science and Technology, Poland
Karol Kyslan, Technical University of Košice, Slovakia

P2 ----- (change)
The State-of-The Art: DC-to-DC Converters for Fuel Cell Vehicular Power Train – Power Electronics in Fuel Cell Technology
Sanjeevikumar Padmanaban, Aalborg University, Esbjerg, Denmark

P5 -----
Energy Harvesting from Vibrations as Autonomous Source of Energy for Sensing and Monitoring
Zdeněk Hadaš, Brno University of Technology, Czech Republic

Closing Session

Thursday, 26 September 2019, 12:30 – 13:00

Room K1

Evaluation of the EDPE 2019 conference.

Announcements of the conferences: PEMC 2020 (Gliwice), PEDG 2020 (Dubrovnik), EDPE 2021 (HR).

Saying Good-bye

Viliam Fedák, Technical University of Košice, Slovakia, Mariusz Stępień, Silesian University of Technology, Poland, Željko Jakopović, University of Zagreb, Croatia, Jadranko Matuško, University of Zagreb, Croatia