



IWED 2021 Program DAY 1 (28 January 2021)

Opening Session & Invited Keynote Speeches. (Chair: Alecksey Anuchin)				
10:00	Opening Ceremony	Alecksey Anuchin	<i>Moscow Power Engineering Institute, Russia</i>	
10:10	Encoderless control:a Way to Increase Reliability of Electric Drives	Fernando Briz	<i>University of Oviedo, Spain</i>	
11:10	Traction Electric Drives:Encoderless Operation and Active Thermal Control	Alecksey Anuchin	<i>Moscow Power Engineering Institute, Russia</i>	
12:00	Fault Tolerance Potential of Multiphase Electric Traction Drives	Jörg Kammermann	<i>Technical University of Munich, Germany</i>	
13:00	Lunch			
13:30	Session 1. Transport (Chairs:Lev Rassudov, Alecksey Anuchin) 10min presentation+5 min discussion			
31	Review of Air Traffic Management Systems for UAV Integration into Urban Airspace	Lee Davies, Yuriy Vagapov, Vic Grout, Stuart Cunningham and Alecksey Anuchin	<i>Glyndwr University, Manchester Metropolitan University, MPEI</i>	
10	Generative Design in Weight Optimization of Reconfigurable Continuous Track Robot	Daniil Valme, Karolina Kudelina, Diana Belolipetskaja, Anton Rassölkin, Toomas Vaimann and Ants Kallaste	<i>Tallinn University of Technology</i>	
26	Practical eco-driving strategy for suburban electric multiple unit	Aleksander Jakubowski and Leszek Jarzebowicz	<i>Gdansk University of Technology</i>	
41	Holistic Rotor Position Sensor System Characterization for Automotive Powertrains	Christoph Datlinger, Mario Hirz and Alecksey Anuchin	<i>Institute of Automotive Engineering - Graz University of Technology, Graz University of Technology, MPEI</i>	
20	Modeling of a Diesel Locomotive Induction Motor Drive with the Field-oriented Control when Operating in a Limited Voltage and High Rotation Frequency Mode	Igor Zhurov, Sergey Bayda and Stanislav Florentsev	<i>Ruselprom Ltd., Russia</i>	
<u>23</u>	An Improved Virtual Capacitor Control Strategy for DC Electric Railway System	Wenqi Hao and Zhigang Chen	<i>Hunan High Speed Railway Vocational and Technical College, China</i>	

15:00		Break		
15:15		Oral Session 2. Electric Machines (Chair: Dmitry Lukichev) 10min presentation+5 min discussion		
	2	Combined method of technical analysis to optimize the aviation electromechanical systems reliability indicators	Flyur Ismagilov, Viacheslav Vavilov, Ruslan Karimov, Oxana Yushkova and Alexander Timofeev	<i>USATU, Russia</i>
	24	Metamodel-based Optimization of Synchronous Reluctance Motor Rotor	Svetlana Orlova, Vladislav Pugachov, Janis Auzins and Anton Rassõlkin	<i>Institute of Physical Energetics, Riga Technical University, Tallinn University of Technology</i>
	25	Comparison of Modular Permanent Magnet Linear Synchronous Motors with Different Winding Layouts of Segmented Stator	Mikhail Tiapkin, Alexander Bitko, Oleg Tolstykh, Lev Rassudov, Gennady Tiapkin, Kirill Zvolinskiy, Aleksandr Balkovoi and Sergey Volkov	<i>MPEI, Russia</i>
	<u>36</u>	Additive Manufacturing of Prototype Axial Flux Switched Reluctance Electrical Machine	Hans Tiismus, Ants Kallaste, Toomas Vaimann, Anton Rassõlkin and Anouar Belahcen	<i>Tallinn University of Technology, Aalto University</i>
	22	Investigating effect of Electromagnetic Force on Sandwich Winding Transformer using Finite Element Analysis	Kamran Dawood and Guven Komurgoz	<i>Istanbul Technical University, Turkey</i>
	40	Determining Specific Power Loss in Joint Area of Laminated Magnetic Core	Yevgeniy Kalinin, Alexandr Chivenkov, Yuriy Vagapov and Alecksey Anuchin	<i>Nizhny Novgorod State Technical University, Glyndwr University, MPEI</i>
	<u>14</u>	Oil Spray Cooling with Hairpin Windings in High-Performance Electric Vehicle Motors	Payam Shams Ghahfarokhi, Andrejs Podgornovs, Ants Kallaste, Toomas Vaimann, Anouar Belahcen and Antonio J. Marques Cardoso	<i>Riga Technical University, Tallinn University of Technology, Aalto University, CISE\University of Beira Interior</i>
	16	Electromechanical Actuators for Aircraft Aerodynamic Surfaces Control	Flur Ismagilov, Ruslan Karimov, Ildus Sayakhov, Ayaz Bakirov, Guzel Zinatullina and Evgeny Zharkov	<i>USATU, Russia</i>
	38	Parameter Identification of Induction Motor Drives	Alexander Khitrov, Andrei Khitrov and Kirill Kurnikov	<i>Pskov State University, Russia</i>
	3	Investigation of FEM software for Magnus Effect Simulation	Galina Demidova, Anton Rassõlkin and Aleksandr Lukin	<i>ITMO University, Tallinn University of Technology</i>
	49	Design reliability indicators improvement on the example of an aircraft air pressure control system electric drive	Flyur Ismagilov, Viacheslav Vavilov, Ruslan Karimov, Oxana Yushkova and Alexander Timofeev	<i>USATU, Russia</i>
	28	TEFC Motor Thermal Protection System Based on a Two-channel Thermodynamic Model	Anatolii Ziuzev, Vladimir Metelkov and Konstantin Kondakov	<i>Ural Federal University, Russia</i>

DAY 2 (29 January 2021)

9:00		Session 3. Digital Twins and Fault Detection(Chairs: Anton Rassölkin, Lev Rassudov) 10min presentation+5 min discussion		
		Keynote: Possibility of Digital Twins Technology for Improving Reliability of the Electric Drive	Anton Rassölkin	Tallinn University of Technology, Estonia
10:00	11	Digital Twin Service Unit for AC Motor Stator Inter-Turn Short Circuit Fault Detection	Viktor Rjabtšikov, Anton Rassölkin, Bilal Asad, Toomas Vaimann, Ants Kallaste, Vladimir Kuts, Sergei Jegorov, Mariusz Stepien and Mateusz Krawczyk	Tallinn University of Technology, Silesian University of Technology
	8	An Overview of Fuzzy Logic Approaches for Fault Detection in Energy Conversion Devices	Galina Demidova, Toomas Vaimann and Anton Rassölkin	ITMO University, Tallinn University of Technology
	12	Induction Motor Bearing Currents – Causes and Damages	Karolina Kudelina, Toomas Vaimann, Anton Rassölkin, Ants Kallaste, Bilal Asad and Galina L. Demidova	Tallinn University of Technology, ITMO University
	44	Engineering Education and Cloud-Based Digital Twins for Electric Power Drive System Diagnostics	Lev Rassudov, Eduard Akmurzin, Alina Korunets and Dmitriy Osipov	MPEI, Russia

11:00		Session 4. Keynote session (Chair: Lev Rassudov)		
11:00		Keynote: Advanced Modeling and Sensorless Control for Improved Reliability of Electrical Motor Drives	Marcello Pucci	INM, Italy
12:30		Tutorial: Single Chip Design of mixed critical and high reliability motion systems with ZYNQ Ultrascale+	Giulio Corradi	Xilinx GmbH, Germany

14:00		Lunch		
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14:30		Session 5. Industrial Applications. (Chair: Levon Gevorkov) 10min presentation+5 min discussion		
	17	Model of Solar Photovoltaic Water Pumping System for Domestic Application	Levon Gevorkov and Irina Kirpichnikova	South Ural State University, Russia
	35	Improving Sucker-rod pump energy efficiency through electric drive movement control	Denis Vishnyakov, Evgeniy Solodkiy and Saveliy Salnikov	Perm National Research Polytechnic University, Russia
	37	Extending Pump Unit Service Life Using Combined Pump Control	Safarbek Oshurbekov, Vadim Kazakbaev, Vladimir Prakht, Vladimir Dmitrievskii and Levon Gevorkov	Ural Federal University, South Ural State University
	27	Influence of an electric drive with periodic load on voltage quality	Anatolii Ziuzev, Anton Nakataev, Stanislav Shelyug and Vladimir Ippolitov	Ural Federal University, Russian State vocational Pedagogical University17
	13	Mathematical Description of the Tensioners Used While Winding of the Wet Composite Material Products	Alexander Mikitinskiy, Boris Lobov and Pavel Kolpakhchyan	South-Russian State Polytechnic University (NPI) Novocherkassk, Rosov state transport university, Rostov-on-Don
	48	Hybrid water collecting and management system using Smart Home Technologies	Emil-Daniel Maer, Adrian Augustin Pop, Dan-Cristian Popa and Ioana Cornelia Gros	Technical University of Cluj Napoca, Romania

14:30		Session 6. Identification and control (Chair: Galina Demidova) 10min presentation+5 min discussion		
	42	Self-tuning Speed Controller with Load Parameters Observer for Servo Drives	Anastasia Kotelnikova, Maxim Lashkevich, Alexey Dmitriev, Nikolay Kuraev, Yuriy Vagapov and Alecksey Anuchin	MPEI, Wrexham Glyndwr University
	29	Numerical method of optimization in robust control of robotic and mechatronic complex systems	Sergei Lovlin, Madina Tsvetkova, Artur Abdullin, Michail Abramchuk and Dmitry Lukichev	ITMO university, Russia
	1	Identification Method of Mathematical Model for Linear Dynamic System	Igor Polyuschenkov	LLC RPA Rubicon – Innovation, Russia
	50	Rotor Position Observer Utilizing a Sinc-filter for Permanent Magnet Synchronous Motor	Andrey Chepiga, Valentina Podzorova, Alecksey Anuchin, Mario Hirz, Christoph Datlinger and Fedor Getmanenko	MPEI, Graz Univesity of Technology
	51	Current Regulation with Nearly Constant Losses for an Open-end Winding Traction IPM Motor Operating at Low Speeds	Egor Kulik, Yousef Ali, Andrey Chepiga, Duy Hiep Do, Fedor Getmanenko and Alecksey Anuchin	MPEI, Russia
	46	Feedforward Control of an Active Front End in Cascaded Medium Voltage Frequency Converter	Yulia Kazemirova, Alecksey Anuchin, Maxim Lashkevich, Andrey Chepiga, Alexey Kovyazin and Egor Kulik	MPEI, Russia

16:00		Break		
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16:15		Session 7. Power Electronics (Chair: Sachin Kumar Jain) 10min presentation+5 min discussion		
16:15		Tutorial: The Next Generation of HVIGBT modules in LV100/HV100 packages	Victor Tolstopyatov	Mitsubishi
16:40	33	NPC Based Multilevel Converter with Fault-Tolerant Capability for a SRM Drive	Vitor Pires, Armando Cordeiro, Daniel Foito and Armando Pires	ESTSetubal - IPS, ISEL - Instituto Superior de Engenharia de Lisboa, Instituto Politécnico de Setúbal, Portugal
	18	Thermal Characterization of Insulating Layers in Metal Core PCB	Steffen Klarmann, Yuriy Vagapov and Heinrich Gotzig	Glyndwr University, Valeo S.A.
	19	The Efficiency Analysis of Resonant Circuits in High-Power Converters of Electrical Energy with Soft Switching Mode	Igor Voronin, Pavel Voronin and Oleg Osipov	MPEI, Russia
	45	Multi-layer Cell Balancing using Switched Inductor and Switched Capacitor Topology	Anurag Jain and Sachin Kumar Jain	PDPM IITDM Jabalpur, India
	30	Methodology for multi-die package semiconductors Thermal Model in a Dynamic Environment	Jose Maria Barón, Guillermo Salinas, Xianghao Mo, Fermín Vergara, Pedro J. Arnaiz, Pedro Alou and Miroslav Vasic	UPM, ESA, Fagor Automation, Spain