



## Workshop Program

### DAY 1 (27 January 2020)

14:00	<b>Invited Tutorials. Room M-214</b>		<b>Moscow Power Engineering Institute technical visits and excursion</b>  Meeting point: <b>MPEI Turbine Monument</b> <a href="https://yandex.ru/maps/-/CKASrE5f">https://yandex.ru/maps/-/CKASrE5f</a>
	Self-Driving Vehicle ISEAUTO and Concept of Digital Twin for Propulsion Drive	Anton Rassõlkin, Taltech, Estonia	
	Overview of the Machine Diagnostics/Failures	Toomas Vaimann, Taltech, Estonia	

### DAY 2 (28 January 2020)

9:00	<b>Registration</b>	Entrance Location: <a href="https://yandex.ru/maps/-/CKA8QT9x">https://yandex.ru/maps/-/CKA8QT9x</a>	
	<b>Opening Session &amp; Invited Keynote Speeches. Room N-201</b> (Chairs: Alecksey Anuchin, Lev Rassudov)		
9:30	Opening Ceremony	Alecksey Anuchin	<i>Moscow Power Engineering Institute, Russia</i>
9:45	The New Concepts of the Levitation and Elevation Systems for High-Precision Applications	Elena Lomonova	<i>Eindhoven University of Technology, Netherlands</i>
	Precision Mechatronics: Kilowatts and Nanometers	Aleksandr Balkovoi	<i>Moscow Power Engineering Institute, Russia</i>
	Sliding Mode Control of Electric Machines	Vadim Utkin	<i>Ohio State University, USA</i>
	Traction Electric Drives: Problems, Solutions, and New Opportunities	Alecksey Anuchin	<i>Moscow Power Engineering Institute, Russia</i>
	Predictive Control of Electric Drives: Principles and Applications	Václav Šmídl	<i>University of West Bohemia, Czech Republic</i>

13:00	<b>Lunch (Room M214) &amp; Poster session (Building N; Chair: Lev Rassudov)</b>		
30	Analysis of Power Losses in Stand-Alone Variable Speed Synchronous Reluctance Generator	Vadim Kazakbaev, Vladimir Prakht and Vladimir Dmitrievskii	<i>Ural Federal University</i>
43	Quasi-optimum Control of Positional Electric Drive with Synchronous Reluctance Motor by Criterion of Minimum Electrical Losses	Mikhail Bychkov, Valentina Kuznetsova and Alecksey Anuchin	<i>Moscow Power Engineering Institute</i>
18	Numerical Design and Optimisation of a Novel Heatsink using ANSYS Steady-State Thermal Analysis	Andre Mueller, Christian Buennagel, Shafiqul Monir, Andrew Sharp, Yuriy Vagapov and Alecksey Anuchin	<i>Glyndwr University, Moscow Power Engineering Institute</i>
36	Numerical Investigation and Static Structural Analysis of Deep Groove Ball Bearings using ANSYS FEA	Dominik Bedacht, Christian Buennagel, Shafiqul Monir, Ikeya Uria, Yuriy Vagapov and Alecksey Anuchin	<i>Glyndwr University, Moscow Power Engineering Institute</i>
20	Condition Monitoring with ANN for Maximizing the Productivity of Electric Drive in Varying Environmental Conditions	<b>Nikolay Fedortsov</b> , Nikolay Dulnev, Yuriy Safonov, Dmitriy Blagodarov	<i>Moscow Power Engineering Institute</i>
16	Vector Control of a Switched Reluctance Motor	<b>Dmitry Veretin</b> , Aleksandr Saushev, Veniamin Samoseiko and Eduard V. Shiryaev	<i>Admiral Makarov State University of Maritime and Inland Shipping</i>
33	Noise-free Force Feedback for Haptic Device of Mobile Assembly Robot	Aleksandr Lukin, Hamid Roozbahani, Galina Demidova, Anton Rassolkin and Toomas Vaimann	<i>ITMO University, Lappeenranta University of Technology, Tallinn University of Technology</i>
37	Application of Machine Learning Algorithms for Oil Well Classification	Zayar Aung, Mikhaylov Ilya Sergeevitch and Ye Thu Aung	<i>Moscow Power Engineering Institute</i>
41	Review of Artificial Intelligence Possibilities in Monitoring and Diagnostics of Electrical Energy Conversion Systems	Toomas Vaimann, Anton Rassolkin, Anouar Belahcen, Raimondas Pomarnacki, Hyunh Van Khang and Ants Kallaste	<i>Tallinn University of Technology, Aalto University, Vilnius Gediminas TU, University of Agder</i>
8	Development of Control System for Interconnected Electric Drives with Electromechanical Torsion	Igor Polyuschenkov	<i>Smolensk Branch of Moscow Power Engineering Institute</i>
9	Analysis of Permanent Magnet Synchronous Machines with Fractional Slot Concentrated Windings	Balkovoi Aleksandr, Rassudov Lev and Tolstykh Oleg	<i>Moscow Power Engineering Institute</i>
13	On the Choice of the Gear for Aircraft Electromechanical Actuator	Flur Ismagilov, Vavilov Viacheslav, Ildus Sayakhov and Aleksandr Podguzov	<i>Ufa State Aviation Technical University</i>
44	Efficiency Determination of Vibrations Damping of Elastic Mechanisms with Electric Drive	Georgiy Pyatibratov, Anzhela Danshina and Lermont Altunyan	<i>Platov South-Russian State Polytechnic University</i>
42	Wheelchair Modular Motor Data Evaluation	Ilya A. Galkin, Andrejs Podgornovs and Rahims Geidarovs	<i>Riga Technical University</i>
21	Model for Energy Management of Residential Building Heating System	Levon Gevorkov, Vaclav Smidl, Martin Sirovy, Toomas Vaimann, Anton Rassolkin and Ants Kallaste	<i>University of West Bohemia, Tallinn University of Technology</i>
48	Method of Efficient Control of the Sucker-Rod Pump Electric Drive	Anatoly Ladygin, Dmitry Bogachenko, Nikolay Ladygin and Vladimir Kholin	<i>Moscow Power Engineering Institute</i>
28	Analysis and Implementation of Three-Level Low Voltage Converter for Electric Drive Applications	<b>Sergey Volkov</b> , Mikhail Tiapkin and Gennadiy Tiapkin	<i>Moscow Power Engineering Institute</i>
50	Wind turbine control system with compensation for wind flow fluctuations and with account for shadow effect	Alecksey Anuchin and Andrey Chepiga	<i>Moscow Power Engineering Institute</i>
51	Using a Control Law Accelerator for Current Loop Performance Enhancement	Evgeniy Stolyarov, Alecksey Anuchin, Maxim Lashkevich, Dmitry Aliamkin, Sevastyan Grishin and Alexandr Zharkov	<i>Moscow Power Engineering Institute</i>

14:30	<b>Oral Session 1 (15+5 min). Room N-201</b> <b>Intelligent Electric Drive Control</b> (Chairs: Lev Rassudov, Alecksey Anuchin)		
	32	Experimental Prototype of High-Efficiency Wind Turbine Based on Magnus Effect	<b>Galina L. Demidova</b> , Aleksandr Lukin, Dmitry V. Lukichev, Anton Rassölkin, Ants Kallaste, Toomas Vaimann and Anouar Belahcen <i>ITMO University, Tallinn University of Technology, Aalto University</i>
	45	Active Current Control of a Linear Generator for Energy Harvesting Applications	<b>Alexey Bodrov</b> , Roger Shuttleworth and Matteo F. Iacchetti <i>The University of Manchester</i>
	10	Current Controller Design of Precision Servo Drive	<b>Mikhail Tiapkin</b> , Aleksandr Balkovoi and Elizaveta K. Samygina <i>Moscow Power Engineering Institute</i>
	31	Fuzzy Logic Sliding Mode Control for Large Optical Telescopes	<b>Galina L. Demidova</b> , Dmitry V. Lukichev, Valentin Tomasov and Ivan Zhdanov <i>ITMO University</i>
	35	Nonlinear Control of Traction in Asynchronous Electric Drive of an Electric Vehicle	<b>Konstantin Oleinikov</b> and Elena Shilenko <i>Southern Federal University</i>
	39	Improving the Motion Parameters of the Production Mechanism Link by Microvibration	Maxim Filimonov, Nikolai Karnaukhov and Dmitry Smyatsky <i>Don State Technical University</i>
16:10	<b>Oral Session 2 (15+5 min). Room N-201</b> <b>Electric Drive System Component Design</b> (Chairs: Anton Rassölkin, Lev Rassudov)		
	22	Finite Element Analysis of Eddy Current Actuator for Linear Motion	<b>Ahmet Fenercioglu</b> and Yusuf Avsar <i>Tokat Gaziosmanpasa University, Trakya University</i>
	38	Medium Frequency Transformer Design with Ārtap Framework	<b>Tamás Orosz</b> , David Pánek, Pavel Karban, Roberto de Oliveira and Joao Pina <i>University of West Bohemia, NOVA University Lisbon</i>
	15	Holistic Consideration and Optimization of Signal Processing on a Resolver-based Rotor Position Sensor Systems in Electric Drive Trains	<b>Christoph Datlinger</b> , Mario Hirz and Alecksey Anuchin <i>Graz University of Technology, Moscow Power Engineering Institute</i>
	46	Dynamics Features of Electric Drive with a Supercapacitor Energy Storage Device Based on Single-Loop Automatic Current Control System	<b>Iurii Plotnikov</b> , Vladimir Polyakov and Nikita Postnikov <i>Ural Federal University</i>
18:00	<b>Gala Dinner</b>		

**DAY 3 (29 January 2020)**

10:00		<b>Invited Tutorial Session. Room N-201</b> (Chair: Alecksey Anuchin)		
10:00		Sliding Mode Control of Power Converters	Vadim Utkin	<i>Ohio State University, USA</i>
11:00		$\Delta\Sigma$ -modulated Signals in Electric Drives	Alecksey Anuchin	<i>Moscow Power Engineering Institute, Russia</i>
11:30		Evolution of High Power SiC modules	Victor Tolstopyatov	<i>Mitsubishi, Russia</i>
12:00		<b>Lunch</b>		
13:00		<b>Student Oral Session 1 (10+5 min). Room N-201</b> <b>Power Electronic Devices and Control</b> (Chairs: Alexey Bodrov, Maria Gulyaeva)		
	2	Variable Switching Point Model Predictive Control for DC-Link Capacitance Minimization of Back-to-Back Converters	<b>Ferdinand Grimm</b> and Mehdi Baghdadi	<i>University College London</i>
	19	Base Switch Element with Increased Reliability for High-Voltage Power Converters	<b>Elena Dukhnich</b> , Igor Voronin and Oleg Osipov	<i>Moscow Power Engineering Institute</i>
	49	An Improved SVPWM Strategy for Three-Level Neutral Point Clamped Converter Capacitor Voltage Balancing	<b>Duy Hiep Do</b> and Alecksey Anuchin	<i>Moscow Power Engineering Institute</i>
	3	Sequential Model Predictive Control of Electric Drives Using a K-Best Sphere Decoding Algorithm	<b>Ferdinand Grimm</b> and Mehdi Baghdadi	<i>University College London</i>
14:00		<b>Student Oral Session 2 (10+5 min). Room N-201</b> <b>Electric Drive Control Systems</b> (Chairs: Galina L. Demidova, Yulia Kazemirova)		
	27	Average Torque Control of the Switched Reluctance Motor in High Speed Zone	<b>Elena Vostorgina</b> , Alexander Krasovsky, Sergey Vasyukov and Sergey Kuznetsov	<i>Bauman Moscow State Technical University, Industrial Metallurgical Holding</i>
	11	Extended Algorithm of Servodrive Mechanical Parameters Identification via Frequency Response Analysis	<b>Elizaveta Samygina</b> , Mikhail Tiapkin, Aleksandr Balkovoi and Lev Rassudov	<i>Moscow Power Engineering Institute</i>
	14	Combination of Luenberger Observer and PI Controller for Rotor Flux Linkage Estimation, by using Induction Motor Saturation Model	<b>Fei Lu</b> , Harald Graul, Dieter Gerling, Johannes Gerold, Matthias Pohl and Andreas Greifelt	<i>Bundeswehr University Munich</i>
	47	Analysis of Motor Power Curve for Detecting Fault Conditions in Sucker Rod Pump	<b>Samuel Tecele</b> and Anatolii Ziuzev	<i>Ural Federal University</i>
15:00		<b>Coffee Break</b>		

15:30	<b>Student Oral Session 3 (10+5 min). Room N-201</b> <b>Traction Systems</b> (Chairs: Christoph Datlinger, Egor Kulik)		
	24	Changing the Transport Characteristics of TEP70 Locomotive	<b>Viktor Rjabtšikov</b> , Anton Rassölkin, Ants Kallaste, Toomas Vaimann and Dmitry V. Lukichev <i>Tallinn University of Technology, ITMO University</i>
	26	A Design of Stabilized Sensor-Error-Tolerant V/f Control in iPMSMs for EV Traction	<b>Yuping Chen</b> , Gunther Götting, Lei Chen and Jian Xie <i>Robert Bosch GmbH, Ulm University</i>
	29	Overhead DC Line Transmission Loss Calculation Algorithm in Motion Simulations of Electric Transport Equipped with Energy Storage System	<b>Girls Stana</b> and Viesturs Brazis <i>Riga Technical University</i>
16:45	<b>Student Oral Session 4 (10+5 min). Room N-201</b> <b>Electrical Machines and Mechanical Design</b> (Chairs: Lev Rassudov, Toomas Vaimann)		
	25	Simulation of Wind Turbine Vibrations	<b>Ekaterina Andriushchenko</b> , Ants Kallaste, Toomas Vaimann, Anton Rassölkin, Aleksandr K. Meshkov, Hamidreza Heidari and Galina L. Demidova <i>Tallinn University of Technology, Peter the Great St. Petersburg Polytechnic University, ITMO University</i>
	12	Mathematical Model of the Electrodynamic Seismic Sensor with Two Mechanic Oscillation Circuits	<b>Nikolay Gavryushin</b> , Pavel Dergachev and Pavel Kurbatov <i>JSC "Science Research Engineer Institute", Moscow Power Engineering Institute</i>
	17	Three-Dimensional Thermal Stator Model of a Fully Air-Cooled Turbogenerator	<b>Vitaly Ryzhov</b> , Pavel Dergachev and Pavel Kurbatov <i>Moscow Power Engineering Institute</i>
	23	Main Faults and Diagnostic Possibilities of BLDC Motors	<b>Karolina Kudelina</b> , Bilal Asad, Toomas Vaimann, Anton Rassölkin, Ants Kallaste and Dmitry V. Lukichev <i>Tallinn University of Technology, ITMO University</i>
	40	Comparison of Synchronous Reluctance Machine and Permanent Magnet-Assisted Synchronous Reluctance Machine Performance Characteristics	<b>Hamidreza Heidari</b> , Ekaterina Andriushchenko, Anton Rassölkin, Ants Kallaste, Toomas Vaimann and Galina L. Demidova <i>Tallinn University of Technology, ITMO University</i>
17:30	<b>Closing&amp;Award Ceremony. Room N-201</b>		
18:00	<b>Young Professionals Event (Bowling party)</b>		
<b>DAY 4 (30 January 2020)</b>			
10:00	<b>Technical Visits</b>		
	<b>Cultural Program</b>		