



5th International Conference on
Electrical Systems for Aircraft, Railway, Ship Propulsion and Road
Vehicles

and
International Transportation Electrification Conference

CONFERENCE PROGRAM



November 7th-9th, 2018
East Midlands Conference Centre, Nottingham, United Kingdom

Detailed Conference Program

November, 6th

15:00 – 19:00 Registration
East Midlands Conference Centre

November, 7th

08:00 Registration

09:00 Opening Session

Welcome from **Professor Serhiy Bozhko** (General Chair, Director of IAT)

Welcome from **Professor Andy Long** (Deputy Vice-Chancellor, The University of Nottingham)

Welcome from **Professor Diego Iannuzzi** (Omnia Green)

Welcome from **Professor Patrick Wheeler** (IEEE, Power Electronic Society)

09:40 Keynote 1: “Prime Movers in Air Vehicle Electrification: Trajectories of Technology”
By **Chris Severns** (Boeing)

10:30 Coffee Break

10:50 Technical sessions

Room 1

Track 1 “*Aircraft Electrical Applications*”, Session #1

Chair: **Dr T. Yang**, Co-Chair: **Dr C. Jones**

Time	Paper ID	Paper Title	Paper Authors
10:50	T1.1.1 1570454306	Design of PMSM for EMA Employed in Secondary Flight Control Systems	Paolo Giangrande, Ahmed Al-Timimy, Alessandro Galassini and Savvas Papadopoulos (<i>University of Nottingham, United Kingdom</i>), Michele Degano and Michael Galea (<i>University of Nottingham Ningbo China, P.R. China</i>)

11:10	T1.1.2 1570458649	Comparative Study Of Back EMF Based Sensorless Control Methods For Dual Three-Phase PMSM	Linhui Fan and Tao Yang (<i>University of Nottingham, United Kingdom</i>); Serhiy Bozhko (<i>The University of Nottingham Ningbo China, P.R. China</i>), Mohamed Rashed (<i>University of Nottingham, United Kingdom</i>)
11:30	T1.1.3 1570471659	3L-NPC AC-DC Power Converter Using Virtual Space Vector PWM with Optimal Switching Sequence Based on g-h Coordinate	Feng Guo, Patrick Wheeler, Serhiy Bozhko and Tao Yang (<i>University of Nottingham, United Kingdom</i>)
11:50	T1.1.4 1570473191	Variable DC Bus Voltage Control Scheme for the More Electric Aircraft Power Generation System	Seang Shen Yeoh and Mohamed Rashed (<i>University of Nottingham, United Kingdom</i>); Mike Sanders (<i>Meggitt Polymers and Composites, United Kingdom</i>); Serhiy Bozhko (<i>The University of Nottingham, United Kingdom</i>)
12:10	T1.1.5 1570454893	Harmonics Suppression for Pulsed Power Loads for DC Power System	Lei Ren and Nan Luo (<i>Nanjing University of Aeronautics and Astronautics, P.R. China</i>), Chunying Gong (<i>Nanjing University of Aeronautics and Astronautics, P.R. China</i>), Shanshui Yang (<i>Nanjing University of Aeronautics and Astronautics, P.R. China</i>)

Room 2

Track 4 “*Electrical Systems in Road Vehicles*”, Session #1

Chair: **Prof G. Tomasso**, Co-Chair: **Dr M Chiandone**

Time	Paper ID	Paper Title	Paper Authors
10:50	T4.1.1 1570452487	Lateral and longitudinal control of bus platoon	Kari Tammi (<i>Aalto University, Finland</i>), Valteri Hyvärinen (<i>Elomatic Consulting Engineering Oy, Finland</i>)
11:10	T4.1.2 1570455408	Energy consumption of electric city buses	Alexander Bunzel (<i>Technische Universität Dresden, Germany</i>), Bernard Baeker (<i>Dresden University of Technology, Germany</i>)
11:30	T4.1.3 1570460301	Critical Aspects of Hybrid PFM-PWM Operation in LLC Converters For Electric Vehicles	Raffaele Fornari, Giovanni Mlgiazza, Emilio Lorenzani and Fabio Immovilli (<i>University of Modena and Reggio Emilia, Italy</i>)
11:50	T4.1.4 1570466503	Fuzzy Rule-Based Energy Management Strategy for a Parallel Mild-Hybrid Electric Bus	Dan Smith (<i>Queen's University Belfast and The William Wright Technology Centre, United Kingdom</i>); Roy Douglas and Wasif Naeem (<i>Queen's University Belfast, United Kingdom</i>)
12:10	T4.1.5 1570472862	Robust Flatness-based Control with State Observer-Based Parameter Estimation for PMSM Drive	Songklod Sriprang, S. (<i>King Mongkut's University of Technology North Bangkok, Thailand</i>)

Room 3

 Track 2 “*Shipboard Electrical Applications*”, Session 1

 Chair: **Prof. G. Sulligoi**, Co-Chair: **Dr. A. Vicenzutti**

Time	Paper ID	Paper Title	Paper Authors
10:50	T2.1.1 1570454339	Influence of DGs on the Single-Ended Impedance Based Fault Location Technique	Hayder Jahanger, Mark Sumner and David Thomas (<i>University of Nottingham, United Kingdom</i>)
11:10	T2.1.2 1570472941	Optimal Operation and Sizing of Energy Storage System for a Ship Electrical Power System	Rahul Bhujade, Ashwin Khambadkone and Salish Maharjan (<i>National University of Singapore, Singapore</i>); Zaki Mohzani (<i>Robert Bosch SEA pte Ltd, Singapore</i>)
11:30	T2.1.3 1570473014	Back-to-Back Modified T-Type Half-Bridge Module for Cascaded Multi-level Inverters with Decreased Number of Components	Marco Rivera, Mohammad Ali Hosseinzadeh and Maryam Sarbanzadeh (<i>Universidad de Talca, Chile</i>); Elham Sarbanzadeh (<i>Iran</i>)
11:50	T2.1.4 1570473112	A Stochastic Approach to Shipboard Electric Loads Power Modeling and Simulation	Alessandro Boveri (<i>University of Genova, Cetena S.p.A., Italy</i>); Federico Silvestro, Paola Gualeni and Diego Neroni (<i>University of Genova, Italy</i>)
12:10	T2.1.5 1570474943	Recent Challenge and Trends of Predictive Control in Power Electronics Application	Marco Rivera and Mohammad Ali Hosseinzadeh (<i>Universidad de Talca, Chile</i>); Elham Sarebanzadeh (<i>Iran</i>); Maryam Sarbanzadeh (<i>Universidad de Talca, Chile</i>)

Room 4

 Special Session 10: “*Modelling and diagnosis in automotive power supply networks*”

 Chair: **Prof S. Frei**, Co-Chair: **Prof L. Brabetz**

Time	Paper ID	Paper Title	Paper Authors
10:50	SS10.1.1 1570455310	State Transition Based Behavioural Model for Electric Arcs in 48 V Automotive Power Supply Networks	Carina Austermann and Michael Kiffmeier (<i>TU Dortmund University, Germany</i>), Stephan Frei (<i>TU Dortmund University - AG Bordsysteme, Germany</i>)
11:10	SS10.1.2 1570456415	Fault analysis of automotive claw pole alternator rectifier diodes	Michael Mürken (<i>University Karlsruhe and AUDI AG, Germany</i>); Dominik Kübel, Alexander Kurz and Andreas Thanheiser (<i>AUDI AG, Germany</i>); Peter Gratzfeld (<i>University Karlsruhe, Germany</i>)
11:30	SS10.1.3 1570461399	Energy and Supply Concepts for Automated Driving	Stefan Schumi (<i>Infineon Technologies AG and TU Graz, Germany</i>)
11:50	SS10.1.4 1570473211	Evaluation of Short-Circuits in Automotive Power Nets with Different Wire Inductances	Stefan Schwimmbeck and Quirin Buchner (<i>BMW Group, Germany</i>); Hans-Georg Herzog (<i>Technical University of Munich, Germany</i>)
12:10	SS10.1.5 1570478559	An Unsupervised Automated Method to Diagnose Industrial Motors Faults	Aman Sheikh (<i>UTP, Malaysia</i>)

12:30
Lunch

13:30
Technical Sessions
Room 1

 Track 5 "Aircraft, Railways, Ship and Road Vehicles: cross-border topics", Session 1

 Chair: **Prof K. Kondo**, Co-Chair: **Dr M. Coppola**

Time	Paper ID	Paper Title	Paper Authors
13:30	T5.1.1 1570454767	A Flexible Control Method of Axial Force for Conical Bearingless Switched Reluctance Motors	Xin Cao, Xiaodi Li and Zhiquan Deng (<i>Nanjing University of Aeronautics and Astronautics, P.R. China</i>)
13:50	T5.1.2 1570461459	A Compensation Method for Full-Digital Sensorless Control of Permanent Magnet Synchronous Machine based on Model Reference Adaptive System	Feipeng Liu, Lie Xu, Ran Liu, Zedong Zheng, Kui Wang and Yongdong Li (<i>Tsinghua University, P.R. China</i>)
14:10	T5.1.3 1570466247	Self-tuning Based on Online Inertia Identification for Motor Drive	Ming Yang, Wanying Qu, Qinan Ni and Dianguo Xu (<i>Harbin Institute of Technology, P.R. China</i>)
14:30	T5.1.4 1570461588	Investigation of Hybrid Electric Aircraft Operation on Battery Degradation	Qingwei Zhu, Andrew Forsyth and Rebecca Todd (<i>The University of Manchester, United Kingdom</i>)
14:50	T5.1.5 1570467899	A Study on Thermal Effects of Different Potting Strategies in Traction Motors	Shafigh Nategh (<i>ABB AB and KTH Royal Institute of Technology, Sweden</i>), Daniel Barber (<i>LORD Corporation, USA</i>), Aldo Boglietti (<i>Politecnico of Turin, Italy</i>), David Lindberg and Ola Aglen (<i>ABB AB, Sweden</i>), Ron Brammer (<i>Asplunds Industri Produkter AB, Sweden</i>)
15:10	T5.1.6 1570473120	Control Design of Bidirectional DC-DC Converter for Supercapacitors Energy storage Interfacing with DC Micro Grids	Mohamed A.A Mohamed (<i>Nottingham University, United Kingdom and Assiut University, Egypt</i>), Mohamed Rashed (<i>University of Nottingham, United Kingdom</i>)

Room 2

 Track 2 "Shipboard Electrical Applications", Session #2

 Chair: **Prof. G. Sulligoi**, Co-Chair: **Dr D. Bosich**

Time	Paper ID	Paper Title	Paper Authors
13:30	T2.2.1 1570453973	Naval Smart Grid Research Program: Phase 2	Andrea Colavitto, Giorgio Sulligoi, Andrea Vicenzutti (<i>University of Trieste, Italy</i>), Regina Lamedica (<i>Sapienza Università di Roma, Italy</i>), Alessandro Ruvio (<i>University of Rome La Sapienza, Italy</i>), Enrico Tironi and Simone Negri (<i>Politecnico di Milano, Italy</i>), Gennaro Lipardi (<i>Italian Navy, Italy</i>)
13:50	T2.2.2 1570461346	Ship's PTO / PTI Torque Field Oriented Control scheme, with	Carlos Reusser and Marcelo A Perez (<i>Universidad Tecnica Federico Santa Maria, Chile</i>), Joel Perez (<i>Universidad Austral de Chile, Chile</i>)

		optimization strategy, for EEDI index improvement	
14:10	T2.2.3 1570461884	A New Method for Selecting the Voltage Level for an Advantageous Transition to DC Distribution in Ships	Maria Carmela Di Piazza, Massimiliano Luna, Giuseppe La Tona, Marcello Pucci and Angelo Accetta (<i>CNR-INM, Italy</i>), Andrea Pietra (<i>Fincantieri S.p.A., Italy</i>)
14:30	T2.2.4 1570473207	Communication Improvements for Intelligent Systems in Microgrids Part I	Marco Rivera, Ricardo Perez, Yamisleydi Salgueiro and Javier Munoz (<i>Universidad de Talca, Chile</i>)
14:50	T2.2.5 1570473209	Communication Improvements for Intelligent Systems in Microgrids Part II	Marco Rivera, Ricardo Perez, Yamisleydi Salgueiro and Javier Munoz (<i>Universidad de Talca, Chile</i>)
15:10	T2.2.6 1570478905	Predictive Control Applied to Cascaded H-Bridge Multilevel Converter	Marco Rivera, Mohammad Ali Hosseinzadeh and Maryam Sarbanzadeh (<i>Universidad de Talca, Chile</i>); E.Sarebanzadeh (<i>Iran, Iran</i>)

Room 3

Special Session #5 “Future Trends in DC Railway Electrification System”

Chair: **Prof P. Ladoux**, Co-Chair: **C. Courtois**

Time	Paper ID	Paper Title	Paper Authors
13:30	SS5.1.1 1570460298	Future DC Railway Electrification System - Go for 9 kV	Andrea Verdicchio (<i>University of Toulouse, Laboratory LAPLACE, France</i>), Philippe Ladoux (<i>Université de Toulouse, France</i>), Hervé Caron (<i>French National Railways (SNCF), France</i>); Sébastien Sanchez (<i>ICAM Toulouse - Lab. LAPLACE, France</i>)
13:50	SS5.1.2 1570466536	Energy Storage System based on Supercapacitors for a 750 V DC railway power supply	Ali Castaings (<i>SNCF, France</i>), Hervé Caron and H. Kharrat (<i>French National Railway (SNCF), France</i>), A. Ovalle (<i>Université de Grenoble Alpes, Grenoble INP, France</i>), Bogdan Vulturescu (<i>SNCF, France</i>)
14:10	SS5.1.3 1570469757	Towards the development of new DC railway system architectures with the use of superconducting devices	Guillaume Escamez and Christian Eric Bruzek (<i>Nexans France, France</i>), Hervé Caron (<i>French National Railways (SNCF), France</i>), Christian Courtois (<i>Reseau, United Kingdom</i>)
14:30	SS5.1.4 1570469787	Dual Active Bridge converters for MV distribution lines into 1500 V DC metro railway system	Alessio Clerici (<i>RSE spa Politecnico di Milano, Italy</i>), Riccardo Chiumeo (<i>RSE - Ricerca sul Sistema Energetico, Italy</i>), hiara Gandolfi and Alberto Villa (<i>RSE spa, Italy</i>), Roberto Zuelli (<i>RSE - Ricerca sul Sistema Energetico, Italy</i>), Claudio Chiappa (<i>RSE spa, Italy</i>), Morris Brenna (<i>Politecnico di Milano – Department of Energy, Italy</i>)
14:50	SS5.1.5 1570473045	Comprehensive integration of Onboard Energy Storage systems in tramways: Birmingham tram case study	Jean François Reynaud and Txomin Nieva (<i>CAF Power and Automation, Spain</i>), Maitane Garmendia (<i>IK4-IKERLAN, Spain</i>)
15:10	SS5.1.6 1570473100	Energy Evaluation for DC Railway Systems with Inverting Substations	Zhongbei Tian (<i>University of Birmingham, United Kingdom</i>), Gang Zhang (<i>Beijing Jiaotong University, P.R. China</i>), Ning Zhao and Stuart

			Hillmansen (<i>University of Birmingham, United Kingdom</i>), Pietro Tricoli and Clive Roberts (<i>University of Birmingham, United Kingdom</i>)
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Room 4

 Special Session 7 “*Model-Based Management of Automotive Power Supply Systems*”

 Chair: **Prof L. Brabetz**, Co-Chair: **Prof H.-G. Herzog**

Time	Paper ID	Paper Title	Paper Authors
13:30	SS7.1.1 1570456558	Model-based analysis and evaluation of 48V automotive power supply systems regarding to electric arc faults	Michael Kiffmeier and Carina Austermann (<i>TU Dortmund University, Germany</i>), Stephan Frei (<i>TU Dortmund University - AG Bordsysteme, Germany</i>)
13:50	SS7.1.2 1570460758	Introduction of Ring Structures in Future Car Generations' Electrical Systems	Laurenz Tippe and Julian Taube (<i>Technical University of Munich, Germany</i>), Joachim Froeschl (<i>BMW Group, Germany</i>), Hans-Georg Herzog (<i>Technical University of Munich, Germany</i>)
14:10	SS7.1.3 1570461668	Simulation-based optimization of an energy management for automotive power nets	Michael Winter, Julian Taube and Hans-Georg Herzog (<i>Technical University of Munich, Germany</i>)
14:30	SS7.1.4 1570461953	Analysis of automotive lead-acid batteries exchange rate on the base of field data acquisition	Michael Mürken (<i>University Karlsruhe & AUDI AG, Germany</i>), Dominik Kübel and Andreas Thanheiser (<i>AUDI AG, Germany</i>), Peter Gratzfeld (<i>University Karlsruhe, Germany</i>)
14:50	SS7.1.5 1570466374	A model-based automotive smart fuse approach considering environmental conditions and insulating aging for higher current load limits and short-term overload operations	Selcuk Önal and Stephan Frei (<i>TU Dortmund University - AG Bordsysteme, Germany</i>)
15:10	SS7.1.6 1570473144	Data-driven Modeling and Simulation of Thermal Fuses	Markus Horn, Ludwig Brabetz and Mohamed Ayeb (<i>University of Kassel, Germany</i>)

15:30
Coffee Break
16:00
Industrial Workshops (IW) and Roundtables (RT)
Room 1

 IW2 “*Electric Superbike Technologies*”

Room 2

 IW3 “*Electrification in Public Transportation*”

Room 3

 IW6 “*Future Trends in DC Railway Electrification Systems*”

17:30
End of Day 1
18:00
Drinks Reception

Great Hall, Trent Building, University Park

November, 8th

08:00 **Registration**

08:30 Keynote 2: “**Electric and Hybrid Propulsion of Aircraft – Power Conversion Opportunities and Challenges**” by **Prof Bulent Sarlioglu** (University of Wisconsin-Madison)

09:15 Keynote 3: “**Completing the Electric Ship**” by **Oliver Simmonds** (BMT)

10:00 **Coffee Break**

10:30 **Technical sessions**

Room 1

Track 1: “*Aircraft Electrical Applications*”, Session #2

Chair: **Dr P. Norman**, Co-Chair: **D. J. Wei**

Time	Paper ID	Paper Title	Paper Authors
10:30	T1.2.1 1570464777	Thermal Analysis of High Power High Voltage DC Solid State Power Controller (SSPC) for Next Generation Civil Tilt Rotor-craft	Jeevan Adhikari, Tao Yang and Mohamed Rashed, Serhiy Bozhko and Patrick Wheeler (<i>University of Nottingham, United Kingdom</i>)
10:50	T1.2.2 1570461685	IDA-Passivity-Based Control for Boost Converter with LC Filter Supplying Constant Power Load	Shengzhao Pang (<i>Université de Lorraine & Northwestern Polytechnical University, France</i>), Babak Nahid-Mobarakeh (<i>University of Lorraine (ENSEM), France</i>), Serge Pierfederici (<i>Université de Lorraine, France</i>)
11:10	T1.2.3 1570466469	PWM impacts on the Reliability of DC/DC Converters with High-Frequency Transformer	Davide Barater and Giovanni Franceschini (<i>University of Modena and Reggio Emilia, Italy</i>), Andrea Cavallini and Luca Lusuardi (<i>University of Bologna, Italy</i>), Giampaolo Buticchi (<i>University of Nottingham Ningbo China, P.R. China</i>)
11:30	T1.2.4 1570473205	Thermal Sensitivity Analysis of a High Power Density Electric Motor for Aeronautical Application	Amal Zeaiter (<i>ENSMA-Poitiers, France</i>), Matthieu Fénot (<i>Prime Institute, France</i>)
11:50	T1.2.5 1570478015	A Twin Spool Engine Emulator for the Study of Power Exchange Idea	Hossein Balaghi Enalou, Mohamed Rashed, Ponggorn Kulsangcharoen, Shajjad Chowdhury, Serhiy Bozhko (<i>The University of Nottingham, United Kingdom</i>)
12:10	T1.2.6 1570473221	Design and Evaluation of a Power Converter for an Energy Storage System for Helicopters	Christian Klumpner and Mohamed Rashed (<i>University of Nottingham, United Kingdom</i>)

Room 2

 Track 5 "Aircraft, Railways, Ship and Road Vehicles: cross-border topics", Session #2

 Chair: **Prof M. Pagano**, Co-Chair: **Dr M. Rashed**

Time	Paper ID	Paper Title	Paper Authors
10:30	T5.2.1 1570461234	Application of Amorphous Cores to DC-excited Flux-modulated Motors Used for Electric Vehicles	Jing Ou (<i>Elektrotechnisches Institut (ETI) & Karlsruhe Institute of Technology, Germany</i>), Yingzhen Liu (<i>Institute of Technical Physics (IPET), Germany</i>), Markus Schiefer (<i>SciMo - Elektrische Hochleistungsantriebe GmbH, Germany</i>), Patrick Breining (<i>Institute of Electrical Engineering (ETI), Germany</i>), Martin Doppelbauer (<i>Karlsruhe Institute of Technology, Germany</i>), Feng Chai (<i>Harbin Institute of Technology, P.R. China</i>)
10:50	T5.2.2 1570466313	The Suppression of Quadrant Glitches with Ball-Screw-Driven Stage	Yangyang Guo, Ming Yang, Qinan Ni, Yining Liu and Dianguo Xu (<i>Harbin Institute of Technology, P.R. China</i>)
11:10	T5.2.3 1570469260	Model Predictive Control Based PID Controller for PMSM for Propulsion Systems	Ahmed Hebala (<i>University of Nottingham, United Kingdom & Arab Academy for Science, Technology and Maritime Transport, Egypt</i>), Michael Galea (<i>University of Nottingham Ningbo China, P.R. China</i>); Ahmed Abdelrauf and Waseem Saad (<i>Arab Academy for Science, Technology and Maritime Transport AASTMT, Egypt</i>)
11:30	T5.2.4 1570473149	State of the Art of Electric Taxiing Systems	Milos Lukic (<i>University of Nottingham, United Kingdom</i>), Ahmed Hebala (<i>University of Nottingham, United Kingdom & Arab Academy for Science, Technology and Maritime Transport, Egypt</i>), Paolo Giangrande, Christian Klumpner, Stefano Nuzzo, George Z. Chen, Chris Gerada and Carol Eastwick (<i>The University of Nottingham, United Kingdom</i>), Michael Galea (<i>University of Nottingham Ningbo China, P.R. China</i>)
11:50	T5.2.5 1570473172	Power Density Optimization of a DC/DC Converter for an Aircraft Supercapacitors Energy Storage	Niklas Fritz (<i>University of Aachen, Germany</i>), Mohamed Rashed and Christian Klumpner (<i>The University of Nottingham, United Kingdom</i>)
12:10	T5.2.6 1570478247	An Improved Extra-Insensitive Input Shaper with feed-forward compensation for Servo Systems	Jia Cao, Ming Yang, Qinan Ni and Dianguo Xu (<i>Harbin Institute of Technology, P.R. China</i>)

Room 3

 Track 3 "Electrical Railway Traction Systems", Session #1

 Chair: **Prof K Hondo**, Co-Chair: **D. Frugier**

Time	Paper ID	Paper Title	Paper Authors
10:30	T3.1.1 1570456395	A Novel Harmonic Current Control Algorithm for Torque Ripple Reduction of Permanent	Amir Ebrahimi (<i>Leibniz University of Hannover, Germany</i>)

		Magnet Synchronous Motors for Traction Application	
10:50	T3.1.2 1570461822	Next generation DCDC converters for auxiliary power supplies with SiC MOSFETs	Marc-André Ocklenburg, Martin Helsper, Manfred Döhmen and Xiao-Qiang Wu (<i>Siemens AG, Germany</i>)
11:10	T3.1.3 1570470975	A study of Design Guideline on Bidirectional Wireless Power Transfer for Railway Vehicles focused on DC Voltages and Current Oscillation	Toranosuke Uehara (<i>Chiba University, Japan</i>), Keiichiro Kondo (<i>Waseda University, Japan</i>)
11:30	T3.1.4 1570472764	Predictive Control for a Flying Capacitor Multilevel Inverter	Marco Rivera, Maryam Sarbanzadeh, Mohammad Ali Hosseinzadeh (<i>Universidad de Talca, Chile</i>), Elham Sarebanzadeh (<i>Iran, Iran</i>)
11:50	T3.1.5 1570473199	Step Up Gain Converter with fast MPPT control under moving partial shading for train rooftop PV-DC- μ G	Vishal Verma Shirish Raizada (<i>Delhi Technological University, India</i>)
12:10	T3.1.6 1570473212	Energy Efficiency for rolling stock, from measuring to savings	André-Philippe Chamaret (<i>SNCF Rolling Stock Engineering Centre, France</i>), Mannevy Pascal and Didier Frugier (<i>SNCF, France</i>), Patrick Henry, Gwenaël Pichon and Younès Galeb (<i>SNCF Mobilités, France</i>)

Room 4

Special Session #1: “Dependable Oriented Design of Electrical Transportation Power Systems”

Chair: **Dr A. Vicenzutti**, Co-Chair: **C. Berridge**

Time	Paper ID	Paper Title	Paper Authors
10:30	SS1.1.1 1570451843	The Hybrid Control Strategy for The Wide Input of The LLC Converter	Haitao Wen, Yundong Ma and Aiyun Zhu (<i>Nanjing University of Aeronautics and Astronautics, P.R. China</i>)
10:50	SS1.1.2 1570454715	Fault Tolerant More Electric Engine/Aircraft Architecture with Integrated Condition-Based Control	Heo Peng Gabriel Ooi (<i>Rolls Royce @ NTU Corp Lab, Singapore</i>), Yicheng Zhang (<i>Nanyang Technological University & Rolls-Royce @ NTU Corp Lab, Singapore</i>), Souvik Dasgupta (<i>Rolls-Royce Singapore Pte Ltd, Singapore</i>), Mark Husband (<i>Rolls-Royce PLC, United Kingdom</i>), Di Wu (<i>Rolls-Royce @ NTU Corp Lab, Singapore</i>), Changyun Wen (<i>Nanyang Technological University, Singapore</i>)
11:10	SS1.1.3 1570465742	Statistical Analysis of the Reliability of Rail Signalling System of the Iranian Railway	Maziar Yazdani and Fatemeh Hajizadeh (<i>Islamic Azad University, Iran</i>), Naghi Parniabaran (<i>Telecommunication, RAI- Signaling exper, Iran</i>), Saeed Ghazi Maghrebi (<i>Yadegar-e-Imam Khomeini (RAH) Branch, Islamic Azad University, Iran</i>)
11:30	SS1.1.4 1570465963	Presentation of the Model of Reliability of the Signaling System with Emphasis on Determining Best Time	Maziar Yazdani and Fatemeh Hajizadeh (<i>Islamic Azad University, Iran</i>), Saeed Ghazi Maghrebi (<i>Yadegar-e-Imam Khomeini (RAH) Branch, Islamic Azad University, Iran</i>)

		Schedule for Repairs and Preventive Maintenance in the Iranian Railway	
11:50	SS1.1.5 1570466994	Thermal Steady-State Behavior of 9-Phase Synchronous Machines with Surface Permanent Magnets during Open Phase Faults	Igor Bolvashenkov, Jörg Kammermann, Kostiantyn Udovichenko, Laurenz Tippe (<i>Technical University of Munich (TUM), Germany</i>)
12:10	SS1.1.6 1570475876	Power Conversion and Distribution Equipment Metamodels for Dependable Design of Shipboard Integrated Power and Energy Systems	Robert M Cuzner, Mark Vygoder and Rounak Siddaiah (<i>University of Wisconsin–Milwaukee, USA</i>)

12:30 Lunch

13:30 Technical Sessions

Room 1

Track 1 “*Aircraft Electrical Applications*”, Session #3

Chair: **Dr L. Xu**, Co-Chair: **Dr J. Chen**

Time	Paper ID	Paper Title	Paper Authors
13:30	T1.3.1 1570461456	Impedance and Stability Analysis of a Permanent Magnet Synchronous Generator System for More Electric Aircraft	Feipeng Liu, Lie Xu, Ran Liu and Yongdong Li (<i>Tsinghua University, P.R. China</i>)
13:50	T1.3.2 1570465921	Impact of thermal overload on the insulation aging in short duty cycle motors for aerospace	Vincenzo Madonna and Paolo Giangrande (<i>University of Nottingham, United Kingdom</i>), Luca Lusuardi and Andrea Cavallini (<i>University of Bologna, Italy</i>), Michael Galea (<i>University of Nottingham Ningbo China, P.R. China</i>)
14:10	T1.3.3 1570473033	A New Ground Power Unit (GPU) Supply for Aircraft Applications	Marco Rivera and Daniel Faundez (<i>Universidad de Talca, Chile</i>), Johann. W. Kolar (<i>ETH Zurich, Switzerland</i>), Patrick Wheeler (<i>University of Nottingham, United Kingdom</i>), Jose A Riveros (<i>Universidad de Talca, Chile & Universidad Nacional de Asunción, Paraguay</i>)
14:30	T1.3.4 1570464898	Design Considerations for Supercapacitor-based Energy Storage Systems for Aircrafts	A. Fares, M. Rashed, C. Klumpner (<i>University of Nottingham, United Kingdom</i>)
14:50	T1.3.5 1570461502	A reliability approach for the MEA power system architecture design optimization problem	Angel Recalde, Jason Atkin, Serhiy Bozhko, Christopher I Hill (<i>The University of Nottingham, United Kingdom</i>)
15:10	T1.3.6 1570461510	Design and Mathematical Modeling of Gearless SMC Flux Reversal Motor	Vladimir Prakht, Vladimir Dmitrievskii and Vadim Kazakbaev (<i>Ural Federal University, Russia</i>), Dmitry Golovanov and David Gerada (<i>University of Nottingham, United Kingdom</i>)

Room 2

 Track 4 “*Electrical Systems in Road Vehicles*”, Session #2

 Chair: **Prof G. Tomasso**, Co-Chair: **Dr M. Di Monaco**

Time	Paper ID	Paper Title	Paper Authors
13:30	T4.2.1 1570457579	Control Development for Hybrid Vehicle Powertrain with Magnetic Continuously Variable Transmission	Khoa Hoang (<i>The University of Sheffield & Romax Technology, United Kingdom</i>), Kais Atallah and Milijana Odavic (<i>University of Sheffield, United Kingdom</i>), Jeff Birchall and Stuart D. Calverley (<i>Magnomatics Ltd, United Kingdom</i>)
13:50	T4.2.2 1570462981	Optimal design of an interior permanent magnet in-wheel motor for electric off-road vehicles	Guanghai Wang (<i>China North Vehicle Research Institute, P.R. China</i>), Xiao Chen (<i>The University of Sheffield, United Kingdom</i>), Yanbin Xing, Dewen Tian and Huayuan Liu (<i>China North Vehicle Research Institute, P.R. China</i>)
14:10	T4.2.3 1570472949	Alternative EV powertrain topologies designed for operation in a conductive electric road system	Anton Karlsson, Gabriel Domingues and Mats Alakula (<i>Lund University, Sweden</i>)
14:30	T4.2.4 1570473113	Brake by Wire for Remotely Controlled Vehicle	Tomas Mrovec, Petr Simonik, Tomas Harach, Samuel Przewczek and Tomas Klein (<i>VSB - Technical University of Ostrava, Czech Republic</i>)
14:50	T4.2.5 1570473124	On-board state of health estimation of Li-Ion batteries packs using incremental capacity analysis with principal components	Alexander Kuznietsov (<i>University of Applied Sciences Mittelhessen, Germany</i>)
15:10	T4.2.6 1570473220	Analysis of Inter-turn Short Circuit Detectability in Electric Vehicles under real Operation Conditions	Frank Landry Tanenkeu Guefack, Aleksej Kiselev and Alexander Kuznietsov (<i>University of Applied Sciences Mittelhessen, Germany</i>)

Room 3

 Track 3 “*Electrical Railway Traction Systems*”, Session #2

 Chair: **Dr B. Vulturescu**, Co-Chair: **Prof D. Iannuzzi**

Time	Paper ID	Paper Title	Paper Authors
13:30	T3.2.1 1570461906	Characterization of DC current sensors under distorted conditions for railway applications	Helko van den Brom, Ronald van Leeuwen and Ralph Hornecker (<i>VSL, The Netherlands</i>)
13:50	T3.2.2 1570463388	Analyses of an AC Linear Actuator for Cross-Wind Stabilisation and Rail Stress Reduction	Christoph Holtmann (<i>German Aerospace Center, Germany</i>)

14:10	T3.2.3 1570465231	Battery-Based Energy Storage Systems for Catenary-Free Electric Trains	Luisa Alfieri (<i>University of Naples Federico II, Italy</i>), Diego Iannuzzi (<i>University of Naples, Italy</i>), Fabio Mottola (<i>University of Naples Federico II, Italy</i>), Mario Pagano (<i>Università degli Studi di Napoli Federico II, Italy</i>), Mariacristina Roscia (<i>University Bergamo, Italy</i>)
14:30	T3.2.4 1570465884	A Theoretical Analysis on Dynamic and Static Characteristics of Control Strategies for Wayside Energy Storage System in DC-electrified Railway	Hiroyasu Kobayashi (<i>Chiba University, Japan</i>), Keiichiro Kondo (<i>Waseda University, Japan</i>), Diego Iannuzzi (<i>University of Naples, Italy</i>)
14:50	T3.2.5 1570466168	A Novel Architecture of Urban Rail Transit Based on Hybrid Energy Storage Systems Using Droop Control	Ran Liu, Lie Xu, Feipeng Liu, Zedong Zheng, Kui Wang and Yongdong Li (<i>Tsinghua University, P.R. China</i>)
15:10	T3.2.6 1570474425	Towards Railway Virtual Coupling	Francesco Flammini (<i>Ansaldo STS, Italy</i>), Valeria Vittorini (<i>University of Naples Federico II, Italy</i>), Roberto Nardone (<i>Università degli Studi di Napoli Federico II, Italy</i>), Stefania Santini, Alberto Petrillo (<i>University of Naples Federico II, Italy</i>), Stefano Marrone (<i>Università della Campania Luigi Vanvitelli, Italy</i>)

Room 4

Special Session #3 “*Electrical Starter-generator systems for more-electric aircraft*”

Chair: **Dr T. Yang**, Co-Chair: **Prof Z. Zhang**

Time	Paper ID	Paper Title	Paper Authors
13:30	SS3.1.1 1570455175	The Designing of Testing System for the Electric Load Management Center in More Electric Aircraft	Xiaofei Liu and Lei Tao (<i>Northwestern Polytechnical University, P.R. China</i>)
13:50	SS3.1.2 1570456149	Frequency Characteristics of Indirect High Frequency Signal Injection Method for Sensorless Starting Control of Aircraft Starter-Generator	Hua Xue, Jiadan Wei, Zhuoran Zhang and Bo Zhou (<i>Nanjing University of Aeronautics and Astronautics, P.R. China</i>)
14:10	SS3.1.3 1570466309	Performance Comparison of Doubly Salient Reluctance Generators for High-Voltage DC Power System of More Electric Aircraft	Yu Li and Zhuoran Zhang (<i>Nanjing University of Aeronautics and Astronautics, P.R. China</i>); David Gerada and Chris Gerada (<i>University of Nottingham, United Kingdom</i>)
14:30	SS3.1.4 1570474594	Design Features of Liquid-Cooled Aviation Starter Generators	Denis Gusakov, Vyacheslav Vavilov and Flur Ismagilov (<i>Ufa State Aviation Technical University, Russia</i>)
14:50	SS3.1.5 1570466303	High Frequency Harmonic Current Generator for More Electric Aircraft Based on GaN HFETs	Meiqi Wang (<i>University of Nottingham Ningbo China, P.R. China</i>), Boran Fan, Lie Xu, Kui Wang, Zedong Zheng and Yongdong Li (<i>Tsinghua University, P.R. China</i>), Chris Gerada, He Zhang

			and Jing Li (<i>University of Nottingham Ningbo China, P.R. China</i>)
15:10	SS3.1.6 1570458309	A Novel Power Converter Unit for Dual-function Technology of Aircraft Three-stage Brushless Synchronous Starter/Generator	Juan Yang (<i>Civil Aviation University of China, P.R.China</i>)

15:30 Coffee Break

16:00 Industrial Workshops (IW) and Roundtables (RT)

Room 1

IW4: "High Performing Electric Vehicles"

Room 2

IW1: "Future of Automotive Electrical Drives in Traction Applications"

Room 3

IW5: "Smart and Green Integrated Transport" ("Next Generation of Charging Station from Urban to extra-Urban Roads")

17:30 End of Day 2

19:00 Gala-Dinner

East Midlands Conference Centre

November, 9th

08:00 Registration

08:30 Keynote 4: **"Dynamic Wireless Charging: Magnetics, Electronics, and Integration Requirements"** - by **Prof Babak Fahimi** (University of Texas)

09:15 Keynote 5: **"New Era of Fuel Cell Electric Vehicles"** - by **Prof Fei Gao** (University of Technology of Belfort-Montbéliard)

10:00 Coffee Break

10:30
Technical sessions
Room 1

 Track 1: “*Aircraft Electrical Applications*”, Session #4

 Chair: **Prof X. Huang**, Co-Chair: **Dr T. Dragicevic**

Time	Paper ID	Paper Title	Paper Authors
10:30	T1.4.1 1570453518	Design of Fault-Tolerant Dual Three-Phase Winding PMSM for Helicopter Landing Gear EMA	Paolo Giangrande, Vincenzo Madonna and Stefano Nuzzo (<i>University of Nottingham, United Kingdom</i>), Michael Galea (<i>University of Nottingham Ningbo China, P.R. China</i>)
10:50	T1.4.2 1570454348	Design of the Power Management System for Electrical Power Systems in More Electric Engine/ Aircraft	Yicheng Zhang (<i>Nanyang Technological University & Rolls-Royce @ NTU Corp Lab, Singapore</i>), Heo Peng Gabriel Ooi (<i>Rolls Royce @ NTU Corp Lab, Singapore</i>), Souvik Dasgupta (<i>Rolls-Royce Singapore Pte Ltd, Singapore</i>), Mark Husband (<i>Rolls-Royce PLC, United Kingdom</i>), Rong Su and Changyun Wen (<i>Nanyang Technological University, Singapore</i>)
11:10	T1.4.3 1570473225	Reliability Analysis of SiC Power Module for More Electric Aircraft Motor Drive Applications	Shane O'Donnell (<i>University of Nottingham, Ireland & Microsemi, United Kingdom</i>), Patrick Wheeler and Alberto Castellazzi (<i>University of Nottingham, United Kingdom</i>)
11:30	T1.4.4 1570472902	Generator overload reduction using smart power management	Cosimo Spagnolo, Sharmila Sumsurooah and Christopher I Hill (<i>The University of Nottingham, United Kingdom</i>), Serhiy Bozhko (<i>The University of Nottingham Ningbo China, P.R. China</i>)
11:50	T1.4.5 1570473029	Three-Phase AC-DC Converters with Passive, Active and Hybrid Current Injection Circuits - Pt I	Marco Rivera and Daniel Faundez (<i>Universidad de Talca, Chile</i>), Johann. W. Kolar (<i>ETH Zurich, Switzerland</i>), Patrick Wheeler (<i>University of Nottingham, United Kingdom</i>), Jose A Riveros (<i>Universidad de Talca, Chile & Universidad Nacional de Asunción, Paraguay</i>)
12:10	T1.4.6 1570473032	Three-Phase AC-DC Converters with Passive, Active and Hybrid Current Injection Circuits - Pt II	Marco Rivera and Daniel Faundez (<i>Universidad de Talca, Chile</i>), Johann. W. Kolar (<i>ETH Zurich, Switzerland</i>), Patrick Wheeler (<i>University of Nottingham, United Kingdom</i>), Jose A Riveros (<i>Universidad de Talca, Chile & Universidad Nacional de Asunción, Paraguay</i>)

Room 2

 Track 4 “*Electrical Systems in Road Vehicles*”, Session #3

 Chair: **Prof F. Gao**, Co-Chair: **Dr M. Coppola**

Time	Paper ID	Paper Title	Paper Authors
10:30	T4.3.1 1570454448	Next Generation of Recharge Types for Electric Buses	Michela Longo (<i>Politecnico di Milano, Italy</i>), Wahiba Yaici (<i>2CanmetENERGY Research Centre, Natural Resources Canada, Canada</i>),

			Maurizio Bottari (<i>Kiepe Electric, Italy</i>), Federica Foiadelli (<i>Politecnico di Milano, Italy</i>)
10:50	T4.3.2 1570461448	Very high speed flatness based current control for a Permanent Magnet Synchronous Motor, Application on internal combustion engines electrification	Najla Haje Obeid, Alexandre Battiston and Christophe Dufresnes (<i>IFP Energies Nouvelles, France</i>)
11:10	T4.3.3 1570461674	Control of an electric starter to a DC-embedded microgrid: Dynamical stability issue	Matheepot Phattanasak (<i>KMUTNB, Thailand</i>), Roghayeh Gavagsaz-Ghoachani (<i>Shahid Beheshti University, Iran</i>), Fadi Sharif, Babak Nahid-Mobarakch, Jean-Philippe Martin, Serge Pierfederici and Farid Meibody (<i>University of Lorraine, France</i>)
11:30	T4.3.4 1570472980	Thermal modeling of an ERS during static charging	Philip Abrahamsson and Mats Alakula (<i>Lund University, Sweden</i>)
11:50	T4.3.5 1570473168	Sensitivity analysis of Kalman filter based estimation methods of lithium-ion batteries under non-stationary conditions	Tilman Happek and Alexander Kuznetsov (<i>University of Applied Sciences Mittelhessen, Germany</i>)
12:10	T4.3.6 1570467976	Current waveforms distribution among electrochemical cells of Modular Multilevel Converters in Battery Electric Vehicles	Marino Coppola (<i>PNP Lab, Italy</i>), Andrea Del Pizzo and Ivan Spina (<i>University of Napoli Federico II, Italy</i>)

Room 3

Special Session #2 "Electrical Power Systems for Hybrid Electric Propulsion Aircraft"

Chair: **Dr C. Jones**, Co-Chair: **Dr P. Norman**

Time	Paper ID	Paper Title	Paper Authors
10:30	SS2.1.1 1570457365	The Problem of Altitude When Qualifying the Insulating System of Actuators for More Electrical Aircraft	Luca Lusuardi and Andrea Cavallini (<i>University of Bologna, Italy</i>)
10:50	SS2.1.2 1570461548	A Holistic Electrical Machine Design Tool for More-Electric and Hybrid-Electric Aircraft	Dmitry Golovanov, David Gerada, Luca Papini, Zeyuan Xu and Chris Gerada (<i>University of Nottingham, United Kingdom</i>)
11:10	SS2.1.3 1570462434	Design considerations for fully superconducting synchronous motors aimed at future electric aircraft	Anup Patel, Vicente Climente-Alarcon, Algirdas Baskys and Bartek Glowacki (<i>University of Cambridge, United Kingdom</i>), Thomas Reis (<i>Oswald Elektromotoren GmbH, UK</i>)
11:30	SS2.1.4 1570462464	An Enhanced Power Generation Centre for More Electric Aircraft Applications	Xiaoyu Lang, Tao Yang, Hossein Balaghi Enalou Serhiy Bozhko, Patrick Wheeler (<i>University of Nottingham, United Kingdom</i>)
11:50	SS2.1.5 1570465233	A Decentralized Energy Management Strategy for A Hybrid Power Supply System	Qingchao Song and Jiawei Chen (<i>Chongqing University, P.R. China</i>)

		with Multiple Fuel Cells and Supercapacitors	
12:10	SS2.1.6 1570466517	Control of DC power distribution system of a hybrid electric aircraft with inherent overcurrent protection	Andrei-Constantin Braitor (<i>The University of Sheffield, United Kingdom</i>), Andrew Mills (<i>University of Sheffield & Rolls-Royce plc, United Kingdom</i>), Visakan Kadirkamanathan (<i>University of Sheffield, United Kingdom</i>), Patrick Norman and Catherine Jones (<i>University of Strathclyde, United Kingdom</i>), George Konstantopoulos (<i>The University of Sheffield, United Kingdom</i>)

Room 4

Special Session #9.1 *“Wide bandgap power devices applications and perspectives for future efficient mobility”*

Chair: **Dr. G. Longobardi**, Co-Chair: **Prof. A. Irace**

Time	Paper ID	Paper Title	Paper Authors
10:30	SS9.1.1 1570461937	Design of Full GaN Power Integrated DC-DC Converter with Over-current Protection	Yung C. Liang (<i>National University of Singapore, Singapore</i>)
10:50	SS9.1.2 1570463467	Effect of Parameters Variability on the Performance of SiC MOSFET Modules	Alessandro Borghese and Michele Riccio (<i>University of Naples Federico II, Italy</i>), Asad Fayyaz and Alberto Castellazzi (<i>University of Nottingham, United Kingdom</i>); Luca Maresca, Giovanni Breglio and Andrea Irace (<i>University of Naples Federico II, Italy</i>)
11:10	SS9.1.3 1570465949	Modelling Framework for Parallel SiC Power MOSFETs Chips in Modules developed by Planar Technology	Tamer Kamel, Antonio Griffo and Jiabin Wang (<i>The University of Sheffield, United Kingdom</i>)
11:30	SS9.1.4 1570466346	Experimental analysis of electro-thermal interaction in normally-off pGaN HEMT devices	Michele Riccio (<i>University of Naples Federico II, Italy</i>), Giorgia Longobardi (<i>Trumpington St, United Kingdom & Kyushu Institute of Technology, Japan</i>), Alessandro Borghese and Luca Maresca (<i>University of Naples Federico II, Italy</i>), Giovanni Breglio (<i>University Naples, Italy</i>), Andrea Irace and Gianpaolo Romano (<i>University of Naples Federico II, Italy</i>)
11:50	SS9.1.5 1570457742	Electro-thermal Simulations of Power Semiconductor Devices during High Stress Events	Andrea Irace and Michele Riccio (<i>University of Naples Federico II, Italy</i>), Giovanni Breglio (<i>University Naples, Italy</i>), Luca Maresca (<i>University of Naples Federico II, Italy</i>)

12:30

Lunch

13:30
Poster Sessions
Room 1: “Road Vehicles and Infrastructures”
Chair: Prof D. Iannuzzi

Paper ID	Paper Title	Paper Authors
P1.1 1570459318	Optimal Design of Fuel Cell Hybrid Power Source Under Energy Constraints	Adriano Ceschia (<i>GeePs & ESTACA'LAB, France</i>), Toufik Azib (<i>ESTACA & ESTACA'LAB, France</i>), Olivier Bethoux (<i>GeePs Group of Electrical Engineering, France</i>), Francisco Alves (<i>GEEPS, France</i>)
P1.2 1570464689	Simulation of Single Belt Motion in a Spherical Wheel Motor with Virtual Shaft	Minki Kim, Junbo Park, Dong Yun Jung, Jong Moon Park (<i>ETRI, Korea</i>)
P1.3 1570466739	Multi-Winding Equalization Technique for Lithium Ion Batteries for Electrical Vehicles	Ali Farzan Moghaddam, Alex Van den Bossche (<i>Ghent University, Belgium</i>)
P1.4 1570473107	Improvement of the Electric Charging Stations Efficiency using situation dependent Fuzzy Algorithms	Alexander Kuznietsov (<i>University of Applied Sciences Mittelhessen, Germany</i>)
P1.5 1570473109	New approach for the evaluation of magnetic fields in dynamic wireless charging for electric vehicles	Salim Guerroudj (<i>Université de Rouen & IRSEEM, France</i>), Habib Boulzazen (<i>IRSEEM/ESIGELEC, France</i>), Zouheir Riah (<i>Normandie Univ UNIROUEN ESIGELEC/IRSEEM, France</i>)
P1.6 1570473111	Multiple electrical machines applied for high drive train efficiency	Nimananda Sharma and Yujing Liu (<i>Chalmers University of Technology, Sweden</i>)
P1.7 1570473223	Power Losses analysis and Efficiency evaluation of an Electric Vehicle Conversion	Andre Abelardo Tavares (<i>SATC, Brazil</i>)
P1.8 1570467751	Wireless Power Transfer circuit for e-bike battery charging system	Marino Coppola (<i>PNP Lab, Italy</i>), Adolfo Dannier (<i>University of Naples Federico II, Italy</i>), Pasquale Cennamo (<i>PNP Lab srl, Italy</i>), Diego Iannuzzi (<i>University of Naples, Italy</i>), Santolo Meo (<i>Federico II University, Italy</i>)
P1.9 1570470727	Direct vector control of induction motors based on rotor resistance-invariant rotor flux observer	Serhiy Bozhko (<i>The University of Nottingham Ningbo China</i>), Serhii Kovbasa, Yevhen Nikonenko and Sergei Peresada (<i>National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute”, Ukraine</i>)
P1.10 1570466056	Analysis of bidirectional switching of SiC transistors in a matrix converter leg	Luis Villagrán Valencia, Jazmin Ramirez, Nancy Mondragon Escamilla, Ismael Araujo-Vargas (<i>National Polytechnic Institute of Mexico, Mexico</i>)
P1.11 1570484913	Design Optimization of Electric Kart for Racing Sport Application -	Diego Iannuzzi, Stefania Santini, Alberto Petrillo, Procolo Ivan Borrino (<i>University of Naples Federico II, Italy</i>)
P1.12 1570495050	Optimal Control for CHB Multi-Level Converter with Integrated ESS for EV Ultra-Fast Charging Station	Giuseppe Tomasso (<i>University of Cassino, Italy</i>), Mauro Di Monaco (<i>University of Cassino and Southern Lazio, Italy</i>), Matilde D’Arpino (<i>The Ohio State Univeristy, USA</i>), Ciro Attaianesi (<i>University</i>)

		<i>of Cassino, Italy), Umberto Abronzini (University of Cassino and Southern Lazio, Italy)</i>
P1.13 1570495052	Optimal Modular BMS for high performances NMC Battery Pack	Giuseppe Tomasso (<i>University of Cassino, Italy</i>), Mauro Di Monaco and Umberto Abronzini (<i>University of Cassino and Southern Lazio, Italy</i>), Ciro Attaianesi (<i>University of Cassino, Italy</i>), Francesco Porpora (<i>University of Cassino and Southern Lazio, Italy</i>), Maurizio Granato and Giovanni Frattini (<i>Texas Instruments, Italy</i>)

Room 2: “*Shipboard and Cross-Border Electrical Applications*”

Chair: **Prof G. Sulligoi**

Paper ID	Paper Title	Paper Authors
P2.1 1570461879	Electric Ship Propulsion with Induction Motor Drive and Li-Ion Battery based Back-up Capability	Angelo Accetta, Maria Carmela Di Piazza, Massimiliano Luna, Giuseppe La Tona and Marcello Pucci (<i>CNR-INM, Italy</i>)
P2.2 1570466350	Onboard DC Solid State Transformer Based on Series Resonant Dual Active Bridge Converter	Shien Wang, Zedong Zheng, Lie Xu and Yongdong Li (<i>Tsinghua University, P.R. China</i>), Ling Peng (<i>China Ship Development and Design Center, P.R. China</i>)
P2.3 1570473227	Control Strategy for Improving Operation Energy Efficiency of Bow Thruster in Ship Microgrid	Zhaoxia Xiao and Huaimin Li (<i>Tianjin Polytechnic University, P.R. China</i>), Josep M. Guerrero (<i>Aalborg University, Denmark</i>), Tianli Zhu (<i>Tianjin Polytechnic University, P.R. China</i>)
P2.4 1570450365	Cost Effective Electric Ship Energy Regulation System Based on Asynchronized Synchronous Motor	Kai Ni, Lujia Xie, Yihua Hu (<i>The University of Liverpool, United Kingdom</i>)
P2.5 1570467262	Direct Measurement of the Current Derivative Using a Delta-Sigma Modulator for Sensorless Traction Motor Control	Alecksey Anuchin, Dmitry Aliamkin, Dmitry Shpak, Alexandr Zharkov and Dimid Surnin (<i>Moscow Power Engineering Institute, Russia</i>), Yuriy Vagapov (<i>Glyndwr University, United Kingdom</i>)
P2.6 1570471790	Using Interval Type2 Fuzzy Controller in Ship Power Systems in Presence of Pulsed Power Loads	Mohammad Hassan Khooban and Tomislav Dragičević (<i>Aalborg University, Denmark</i>), Hooman Mohammadi Moghadam (<i>Shiraz University of Tehcnology, Iran</i>), Ali Masoudian (<i>Department of Electrical and Computer Engineering Shiraz University, Iran</i>)
P2.7 1570471797	Modeling and Hardware-in-the-Loop Real-Time Simulation for the Secondary LFC in Time-Delay Shipboard Microgrids	Mohammad Hassan Khooban, Navid Vafamand, Tomislav Dragičević, Mehdi Mardani, and Rasool Heydari (<i>Aalborg University, Denmark</i>)
P2.8 1570473188	A Review of Torque Ripple Minimization Techniques in Switched Reluctance Machine	Ganeish Velmurugan (<i>University of Nottingham, United Kingdom</i>), Serhiy Bozhko (<i>The University of Nottingham, P.R. China</i>), Tao Yang (<i>University of Nottingham, United Kingdom</i>)
P2.9 1570454529	A Novel SOC Estimation Method for Lithium Ion Battery Based On Improved Adaptive PI Observer	Usama Amir, Lei Tao, Xiaobin Zhang, Muhammad Saeed and Manzoor Hussain (<i>Northwestern Polytechnical University, Xi'an, P.R. China</i>)

P2.10 1570461546	Enhanced Rotor Position and Speed Extractions for Salient PMSM Sensorless Drives Based on An Extended State Observer	Tianru Zhang, Zhuang Xu, Jing Li and Hao Yan (<i>University of Nottingham Ningbo China, P.R. China</i>)
P2.11 1570466359	A Control Method with Ring Structure for Switched Reluctance Motor	Haitao Sun, Ali Farzan Moghaddam and Mohannad Jabbar Mnati (<i>Gent University, Belgium</i>), Abdalla Hussein Mohamed (<i>Gent University, Belgium and Cairo University, Egypt</i>), Peter Sergeant and Alex Van den Bossche (<i>Ghent University, Belgium</i>)
P2.12 1570484809	Design and Simulation of Electrical Emergency System in Aircraft using Ram Air Turbine	Ahmed Altuma (<i>University of Kerbala, Iraq</i>), Mohammed Ridha Alhakeem (<i>Midland Refinery Company Ministry of Oil, Iraq</i>)
P2.13 1570495566	Circulating Current control of a Modular Multilevel Converter (MMC) with State Feedback Controller and Harmonic Current Suppression	Abdurrahman Umar Lawan, Haider Abbas F. Almurib, Jeen Ghee Khor (<i>The University of Nottingham Malaysia Campus, Malaysia</i>), Sulaiman Babani (<i>Hussaini Adamu Federal Polytechnic, Nigeria</i>)
P2.14 1570472908	Power-Electronics-Based Power Distribution System of a MVDC Ship: AC/DC Interface Converters and Control System	Rosa Anna Mastromauro and Lorenzo Bongini (<i>University of Florence, Italy</i>), Daniele Bosich, Giorgio Sulligoi (<i>University of Trieste, Italy</i>)

Room 3: “Electrical Railway Traction Systems and Cross-Border Topics”

Chair: Prof P. Ladoux

Paper ID	Paper Title	Paper Authors
P3.1 1570473171	Modelled, Simulation and Design of Collecting Grid of Stray Currents in Slab Track in DC Electrified Railway Systems	Jordi Coves (<i>IDOM, Spain</i>), Joan Rull (<i>Polythecnical University of Catalonia, Spain</i>), Francisco José Sanchez Aguilar (<i>IDOM, Spain</i>)
P3.2 1570465783	Urban Rail Transit Power System Integrated with Electric Vehicles Based on CLLC Resonant and Buck-boost Converter	Hao Liu, Zedong Zheng, Yongdong Li, Zheng Xu and Ruidi Yao (<i>Tsinghua University, P.R. China</i>)
P3.3 1570461587	Two-stage Interleaving DC/DC Topology Based on Phase-shift Full bridge Converter	Cheng Pu, Zhenyang Hao and Chenmao Shao (<i>Nanjing University of Aeronautics and Astronautics, P.R. China</i>)
P3.4 1570469732	Predictive Control for MPPT in a Non-DC/DC Stage Photovoltaic System	Marco Rivera, Carlos Muñoz and Ariel Villalon (<i>Universidad de Talca, Chile</i>); Jose A Riveros (<i>Universidad de Talca, Chile & Universidad Nacional de Asunción, Paraguay</i>), Javier Munoz (<i>Universidad de Talca, Chile</i>)
P3.5 1570466324	Grid demand reduction for high-speed dynamic road charging by narrowing inter-vehicle distance	Saleh Abdusalam Ali, Volker Pickert and Haris Patsios (<i>Newcastle University, United Kingdom</i>)
P3.6 1570473181	Cable Bundle Protection and Cross-Section Reduction by using a centralized Smart Fusing Strategy	Leonard Gysen, Ludwig Brabetz, Mohamed Ayeb (<i>University of Kassel, Germany</i>)

P3.7 1570461948	Determination of the Insulation Fault of Windings of the Tree-Phase AC Motors	Nikolay Grebchenko (<i>National University of Life and Environmental Science of Ukraine, Ukraine</i>)
P3.8 1570466378	Parametric study of optimum gate-resistance for performance and short-circuit robustness of novel half-bridge IGBT modules	Alireza Cheraghinezhad, Abdallah Hussein, Alberto Castellazzi (<i>University of Nottingham, United Kingdom</i>), Katsuaki Saito (<i>Hitachi Power Semiconductor Device Ltd., Japan</i>)
P3.9 1570470072	Modulated Model Predictive Speed Control for PMSM Drives	Cristian Garcia and Jose Rodriguez (<i>Universidad Andres Bello, Chile</i>), Cesar Silva (<i>Universidad Tecnica Federico Santa Maria, Chile</i>), Shafiq Odhano and Pericle Zanchetta (<i>University of Nottingham, United Kingdom</i>)
P3.10 1570470527	Optimized Predictive Control and Equalization of Zero-States for a 27-level Cascade Asymmetric Multilevel Converter	Javier Munoz, Patricio Gaisse, Rodrigo Aliaga, Ariel Villalon, Marco Rivera and Carlos Baier (<i>Universidad de Talca, Chile</i>)
P3.11 1570463778	Robust stabilization and synchronization of a class of fractional order chaotic systems via second-order sliding mode controller	Xiaomin Tian (<i>Jinling Institute of Technology, P.R.China</i>)
P3.12 1570465927	Hesop: advanced reversible substation solution	Stephane Binet, Francois Maurin (<i>Alstom, France</i>)
P3.13 1570497228	Use of a HIL railway traction simulator for low frequency network stability studies	David Cypers (<i>Alstom, France</i>), Nicolas Roux and Philippe Ladoux (<i>University of Toulouse, France</i>), Sebastien Belin, Meli Takuefou and Yosr Hachicha (<i>Alstom, France</i>)

Room 4: “Aircraft Electrical Applications”

Chair: **Dr T. Yang**

Paper ID	Paper Title	Paper Authors
P4.1 1570461240	Simple and Efficient Direct Torque Control of Induction Motor Based on Artificial Neural Networks	Kenza Bouhoune (<i>University of Sciences and Technology Houari Boumediene (USTHB) & Electrical and Industrial Systems Laboratory (LSEI), Algeria</i>), Krim Yazid (<i>University of Sciences and Technology Houari Boumediene (USTHB), Algeria</i>), Mohamed Seghir Boucherit (<i>Polytechnic National School (ENP), Algeria</i>), Babak Nahid-Mobarakeh (<i>University of Lorraine (ENSEM), France</i>)
P4.2 1570455161	Dynamic Programming Algorithm for Management of Aircraft Power Supply System	Yazhu Liu (<i>Nanjing University of Aeronautics and Astronautics, P.R. China</i>), Qinhuai Wei (<i>Shanxi Aircraft Industry (Group) Co. Ltd., P.R. China</i>), Shanshui Yang and Li Wang (<i>Nanjing University of Aeronautics and Astronautics, P.R. China</i>)

P4.3 1570488906	Investigation of HTS cable impact on Turbo-Electric Aircraft Performance	Sriharsha Venuturumilli (University of Bath, United Kingdom), Fred Berg (Airbus, France), Min Zhang and Yawei Wang (University of Strathclyde, United Kingdom), Jay Patel (University of Bath, United Kingdom)
P4.4 1570475010	Performance Analysis of PMSM for High-Speed Starter- Generator System	Ahmed Diab (<i>The University of Nottingham Ningbo China, P.R. China</i>), Mohamed Rashed (<i>University of Nottingham, United Kingdom</i>), Jing Li, Chris Gerada and Serhiy Bozhko (<i>The University of Nottingham Ningbo China, P.R. China</i>)
P4.5 1570467329	Control System Design and the Power Management of MEFADEC Assembled on More-Electric Aircraft	Mingming Yin (<i>AECC Aero-engine Control System Institute, P.R. China</i>), Serhiy Bozhko (<i>The University of Nottingham, P.R. China</i>), Taike Yao (<i>AECC Aero-engine Control System Institute, P.R. China</i>)
P4.6 1570466495	Sizing Procedure of PMSMs for Hybrid Parallel Aircraft Propulsion	Adolfo Dannier, Andrea Del Pizzo, Luigi Pio Di Noia, Ivan Spina (<i>Università of Naples Federico II, Italy</i>)
P4.7 1570472151	Line-Start Permanent Magnet Synchronous Motor for Aerospace Application	Denis Gusakov, Flur Ismagilov and Vecheslav Vavilov (<i>Ufa State Aviation Technical University, Russia</i>)
P4.8 1570454233	Research on Characteristics of DC Arc Fault Based on Wavelet Transform	Yaojia Zhang, Li Wang, Shanshui Yang (<i>Nanjing University of Aeronautics and Astronautics, P.R.China</i>)
P4.9 1570456071	The Testing Platform of Hybrid Electric Power System for a Fuel Cell Unmanned Aerial Vehicle	Zhou Yang and Lei Tao (<i>Northwestern Polytechnical University, P.R. China</i>)
P4.10 1570456490	Adaptive V/f-Based Control for Induction Machines in Distributed Electric Propulsion Systems	Michal Szytkiel (<i>University of Strathclyde, United Kingdom</i>), Suvajit Mukherjee (<i>Singapore</i>), Rafael Pena-Alzola, Catherine Jones, Patrick Norman, Stuart Galloway and Graeme Burt (<i>University of Strathclyde, United Kingdom</i>)
P4.11 1570466550	Feasibility of Superconducting Gas-Insulated Transmission Lines for Electric Aviation Applications	Peter Cheetham and Chul Kim (<i>Center for Advanced Power Systems, USA</i>), Lukas Graber (<i>Georgia Institute of Technology, USA</i>), Sastry Pamidi (<i>Center for Advanced Power Systems, USA</i>)
P4.12 1570466398	Modelling Method of the Direct Drive Valve with Limited Information for More Electric Aircraft Applications	Xu Han, Jian Fu (<i>Beihang University, P.R.China</i>), Yayiana Minav (<i>Aalto University, Finland</i>), Yongling Fu (<i>Beihang University, P.R.China</i>), Matti Pirtola (<i>Aalto University, Finland</i>)
P4.13 1570488180	HTS Machines for Electrical Aircraft Propulsion: Baseline Target for Technical Feasibility	Jay Patel (<i>University of Bath, United Kingdom</i>), Min Zhang and Weijia Yuan (<i>University of Strathclyde, United Kingdom</i>), Harsha Venuturumilli (<i>University of Bath, United Kingdom</i>)

15:00

Coffee Break

15:30
Technical Sessions
Room 1

 Special Session #6 “*High Performance Electrical Machines for Automotive*”

 Chair: **Dr G. Vakil**, Co-Chair: **Mr D Evans**

Time	Paper ID	Paper Title	Paper Authors
15:30	SS6.1.1 1570455483	Air Gap Flux Density Analytical Model for a Fractional-Slot Concentrated-Winding SM-PMSM	Saleh Edhah and Jamal Al Sawalhi (<i>Khalifa University of Science and Technology, United Arab Emirates</i>)
15:50	SS6.1.2 1570471311	Comparative Study of Non-linear Controllers Applied to a Six-Phase Induction Machine	Magno Ayala, Osvaldo González, Jorge Rodas and Raúl Gregor (<i>Universidad Nacional de Asunción, Paraguay</i>), Yassine Kali (<i>Ecole Mohamadia d'Ingenieurs & All Laboratory, Morocco</i>)
16:10	SS6.1.3 1570473163	Improved loss modelling of electrical traction motors by including magnetic skin effect	Sigrid Jacobs and Jan Rens (<i>ArcelorMittal, Belgium</i>), Emmanuel Attrazic (<i>ArcelorMittal, France</i>)
16:30	SS6.1.4 1570473186	Assessment of cooling integration with direct cooled windings	Avo Reinap, Michael Gabassi, Mats Alaküla and Mats Andersson (<i>Lund University, Sweden</i>)
16:50	SS6.1.5 1570473203	Design of a Flux-Switching PM Machine with Axial Fan Capability	Hao Ding and William Sixel (<i>University of Wisconsin-Madison & WEMPEC, USA</i>), Connor Temme and Bulent Sarlioglu (<i>University of Wisconsin - Madison, USA</i>)

Room 2

 Track 4 “*Electrical Systems in Road Vehicles*”, Session #4

 Chair: **Prof G. Tomasso**, Co-Chair: **Dr M. Di Monaco**

Time	Paper ID	Paper Title	Paper Authors
15:30	T4.4.1 1570450230	Three-Phase Four-Switch Inverter Fed IPMSM Sensorless Control Scheme Using Sine-Wave HF Voltage Injection	Jiadong Lu (<i>Northwestern Polytechnical University, P.R. China</i>); Kai Ni, Yihua Hu and Xinhua Li (<i>The University of Liverpool, United Kingdom</i>)
15:50	T4.4.2 1570464931	Evaluation and Optimization of a Floating Interleaved DC-DC Boost Converter under Switch Fault for Fuel Cell Applications	Shengrong Zhuo, Rui Ma, Arnaud Gaillard and Damien Paire (<i>University of Technology of Belfort-Montbéliard, France</i>), Yigeng Huangfu (<i>Northwestern Polytechnical University, P.R. China</i>), Fei Gao (<i>University of Technology of Belfort-Montbéliard, France</i>)
16:10	T4.4.3 1570470923	Current Control of Interleaved DC-DC Converter in Continuous and Discontinuous Mode	Marcelo A Perez and Mario Lopez (<i>Universidad Tecnica Federico Santa Maria, Chile</i>), Samir Kouro (<i>Ryerson University, Canada</i>)
16:30	T4.4.4 1570472778	Energy Harvesting System using Shock Absorber Vibration	JinKyu Lee (<i>University of Science and Technology, Korea</i>), YonDo Chun (<i>Korea Electrotechnology Research Institute & University of Science and Technology, Korea</i>), PilWan Han and DeokJe Bang (<i>Korea Electrotechnology Research Institute, Korea</i>), Minh-Trung Duong (<i>University of Science</i>)

			<i>and Technology & Korea Electrotechnology Research Institute, Korea), ByoungGun Park (Korea Electrotechnology Research Institute & University of Science and Technology, Korea)</i>
16:50	T4.4.5 1570472871	Sensorless Control for PMSM Drives Using the Cubature Kalman Filter based Speed and Flux Observer	Zheng Wang and Haomin Li (<i>Southeast University, P.R. China</i>)

Room 3

Special Session #8 *“PEPDS (Power Electronics Power Distribution Systems) for transportation electrification”*

Chair: **Dr D. Bosich**, Co-Chair: **Dr R. Cuzner**

Time	Paper ID	Paper Title	Paper Authors
15:30	SS8.1.1 1570436419	A Novel Solid-State Circuit Breaker for DC Microgrid System	Weilin Li, Xuanlyu Wu, Yufeng Wang, Renyou Xie and Zhiyong Zhang (<i>Northwestern Polytechnical University, P.R. China</i>), Heng Wang (<i>Beijing Aeronautical Technology Research Center, P.R. China</i>)
15:50	SS8.1.2 1570454875	Research on the Control of Isolated Dual-mode Inverter	Yuan Gan, Zhenyang Hao, Cheng Pu, Chenmao Shao and Cheng Zhang (<i>Nanjing University of Aeronautics and Astronautics, P.R. China</i>)
16:10	SS8.1.3 1570469508	New Asymmetric Cascaded Multi-level Converter with Reduced Components	Marco Rivera, Mohammad Ali Hosseinzadeh and Maryam Sarbanzadeh (<i>Universidad de Talca, Chile</i>), Elham Sarbanzadeh (<i>Iran</i>)
16:30	SS8.1.4 1570498700	Analysis and Mitigation of Common Mode Current in SiC MOSFET Gate Driver Power Supply	Lee Gill (<i>Virginia Tech & Center For Power Electronics Systems (CPES), USA</i>), Takayuki Ikari (<i>Nissan Motor Co. Ltd., Japan</i>)
16:50	SS8.1.5 1570473147	A frequency analysis of the small-signal voltage model of a MVDC power system with two cascade DC-DC converters	Stefano Pastore, Daniele Bosich, Giorgio Sulligoi (<i>University of Trieste, Italy</i>)

Room 4

Special Session #9.2 *“Wide bandgap power devices applications and perspectives for future efficient mobility”*

Chair: **Dr G. Longobardi**, Co-Chair: **Prof A. Irace**

Time	Paper ID	Paper Title	Paper Authors
15:30	SS9.2.1 1570493536	Gate leakage-current, damaged gate and open-circuit failure-mode of recent SiC Power Mosfet - Overview and analysis of unique properties for converter protection and possible future safety management	Frédéric Richardeau and François Boige (<i>Lab. LAPLACE - CNRS - University of Toulouse, France</i>), Stephane Lefebvre (<i>SATIE, ENS-CACHAN, France</i>)

15:50	SS9.2.2 1570461875	Wide Bandgap Voltage Source Inverter Design for Automotive Electric Drivetrain	Filippo Savi and Giampaolo Buticchi (<i>University of Nottingham Ningbo China, P.R. China</i>), Chris Gerada and Patrick Wheeler (<i>University of Nottingham, United Kingdom</i>), Davide Barater (<i>University of Modena and Reggio Emilia, Italy</i>)
16:10	SS9.2.3 1570473050	GaN power devices for Electric Vehicles State-of-the-art and future perspective	Giorgia Longobardi (<i>Trumpington St, United Kingdom, Great Britain</i> , & <i>Kyushu Institute of Technology, Japan</i>), Loizos Efthymiou and Martin Arnold (<i>University of Cambridge, United Kingdom</i>)
16:30	SS9.2.4 1570473130	SiC power MOSFETs Threshold-voltage hysteresis and its impact on Short Circuit operation	Besar Asllani (<i>Nottingham University & Ampère Lab INSA Lyon, United Kingdom</i>), Asad Fayyaz and Alberto Castellazzi (<i>University of Nottingham United Kingdom</i>), Herve Morel (<i>Université de Lyon, INSA Lyon, Lab Ampère, CNRS, France</i>), Dominique Planson (<i>Université de Lyon Laboratoire Ampere CNRS UMR 5005 Insa de Lyon, France</i>)
16:50	SS9.2.5 1570473185	A Comparison of the Transient Behavior of the Drain Current Hysteresis in SiC-MOSFETs	Christian Unger and Martin Pfof (<i>TU Dortmund, Germany</i>)

17:15 Conclusive remarks and Summary of the Conference.

End of the Conference