DETAILED PROGRAM

Monday, September 24, 12:30PM-2:10PM

Control of Solar PV Systems

Monday, September 24, 12:30PM-2:10PM, Room: A107, Chair: Pedro Rodriguez, Aparna Saha

12:30PM *Evaluation of Low Voltage Loss Under Partial Shading Conditions in Solar Photovoltaic Systems [#18703]*
Hayder Ali and Hassan Abbas Khan, Dept. of EE, LUMS, Pakistan

12:55PM *Adaptive Dual Maximum Power Point Tracking Algorithm for PV DC-DC Conversion Stage [#18833]*
Ala Hussein, Anirudh Pise, Xi Chen and Issa Batarseh, Yarmouk University, Jordan; University of Central Florida, United States

1:20PM *Solar Off-Maximum Power Set-point Utilizing Ripple Correlation Control [#19574]*
Jason Galtieri and Philip Krein, University of Illinois Urbana-Champaign, United States

1:45PM *Universal Control Strategy using Operating Point Projection Technique for Improved Maximum Power Point Behavior in Solar Array Hardware Emulation [#19658]*
Thusitha Wellawatta and Sung-Jin Choi, University of Ulsan, Korea (South)

Microgrid Control-I

Monday, September 24, 12:30PM-2:10PM, Room: B111, Chair: Maryam Saeedifard, Amir Yazdani

12:30PM *A Novel RLC Load Emulation for Anti-Islanding Test Bench for Inverter and Machine Based Distributed Generation [#18206]*
Nakul Narayanan Kuruveettil and Umanand Loganathan, Indian Institute of Science, India

12:55PM *Control of Autonomous Single Phase Utility Interactive Reconfigurable Microgrid [#18389]*
Shailendra Kumar and Bhim Singh, Indian Institute of Technology Delhi, India

1:20PM *Grid Current Control Based Smooth Transfer Control Method in Distributed Generation [#18476]*
Xin Meng, Jinjun Liu, Zeng Liu and Ronghui An, Xi'an Jiaotong University, China

1:45PM *Modeling a DC Microgrid with Real Time Power Management using DC Bus Signalling [#19022]*
Akansha Garg, Bhakti Joshi and Ramesh Oruganti, IIT Mandi, India

Energy and Power Management

Monday, September 24, 12:30PM-2:10PM, Room: B117, Chair: Jae-Do Park, Norma Anglani

12:30PM *An Energy Routing Algorithm Used for Power Pool Transaction in Energy Internet [#18372]*
Hui Guo, Fei Wang, Lijun Zhang, Xiayun Feng and Jian Luo, Shanghai University, China

12:55PM *Lifetime Control of Modular Smart Transformers Considering the Maintenance Schedule [#18534]*
Vivek Raveendran, Markus Andresen and Marco Liserre, Chair of Power Electronics, University of Kiel, Germany

1:20PM *Smart Home Energy Management Using Real-Time Pricing of Storage Devices [#18563]*
Sima Aznavi and Poria Fajri, University of Nevada, Reno, United States

1:45PM *Real Time Electricity Price Forecasting for Energy Management in Grid-Tied MTDC Microgrids [#18607]*
Md Habib Ullah, Subrata Paul and Jae-Do Park, University of Colorado Denver, United States

Inductive power transfer

Monday, September 24, 12:30PM-2:10PM, Room: C120, Chair: Mehmet Timur Aydemir, Rashmi Prasad

12:30PM *A Novel Integrated Boost Modular Multilevel Converter for High Power Wireless EV Charging [#18895]*
Wenwei Victor Wang, Duleepa J Thrimawithana, Baljit Riar and Regan Zane, The University of Auckland, New Zealand; Utah State University, United States

12:55PM *Methods to Reduce Air-Gap Center Region Magnetic and Electric Fields for Large Gap Inductive Wireless Power Transfer Systems [#19091]*
Guangqi Zhu, Apoorva Athavale and Robert D. Lorenz, University of Wisconsin - Madison, WEMPEC, United States

1:20PM *A Litz Wire Based Novel Passive Shield Design for Wireless Charging System for Electric Vehicle [#19696]*
Mostak Mohammad and Choi Seungdeog, The University of Akron, United States

1:45PM *A Comparison of Multi-Coil Pads in IPT systems for EV Charging [#18620]*
Fei Yang Lin and Grant Covic, The University of Auckland, New Zealand

Multi-level converters 1

Monday, September 24, 12:30PM-2:10PM, Room: B119, Chair: Yuan Xibo, Luca Tarisciotti

12:30PM *Cascaded Open-Circuit Fault Ride-Through of Modular Multilevel Converters with Model Predictive Control [#18087]*
Dehong Zhou, Pengfei Tu, Huan Qiu and Yi Tang, Nanyang Technological University, Singapore

12:55PM *DC Fault Tolerant Modified Parallel Hybrid Converter with Enhanced Operating Range [#18948]*
Siba Kumar Patro, Anshuman Shukla and Mahendra Ghat, Indian Institute of Technology Bombay, India

1:20PM *Grid-Connected Voltage Source Converters with integrated Multilevel-Based Active Filters [#19077]*
Daniel Bernet, Lukas Stefanski, Ruediger Schwendemann, Christoph Rollbuehler and Marc Hiller, Karlsruhe Institute of Technology, Germany

1:45PM *Open-End Winding Multilevel Unidirectional Six-Phase Rectifier With Reduced Switch Count [#19279]*
Ivan da Silva and Cursino Brandao Jacobina, Federal University of Campina Grande, Brazil

DC-DC non-isolated 1

Monday, September 24, 12:30PM-2:10PM, Room: C122, Chair: Santanu Mishra, Dazhong Gu

12:30PM *A Non-Isolated Single-Stage 48V-to-1V VRM with a Light Load Efficiency Improvement Technique [#18561]*
Somnath Khatua, Debaprasad Kastha and Santanu Kapat, Indian Institute of Technology Kharagpur, India

12:55PM *Novel Actively Tuned Resonant Filter based Buck Converter with Tunable Capacitor [#19516]*
Ben Guo, Suman Dwari, Priya Shashank, Ngo Khai, Burgos Rolando and Nies Craig, United Technologies Research Center, United States; Virginia Polytechnic Institute and State Univers, United States; AVX Corporation, United States

1:20PM *Control Method of Flying Capacitor Converter Operated in Discontinuous Current Mode [#19064]*
Jun-ichi Itoh, Ryoichi Ishibashi, Takahiro Kumagai, Nagisa Takaoka, Hoai Nam Le and Keisuke Kusaka, Nagaoka University of Technology, Japan; Nagaoka University of Technology, Viet Nam

1:45PM *Resonant Cross-Commutated Point-of-Load Converter [#18599]*
Ting Ge, Brian Carpenter and Khai Ngo, CPES, Virginia Tech, United States; Texas Instruments, Inc., United States

Modeling and Control of DC-DC Converters 1

Monday, September 24, 12:30PM-2:10PM, Room: A108, Chair: Xinbo Ruan, Koji Orikawa

12:30PM *Modeling and Control for Interleaved Voltage-Doublers Boost Converter [#18347]*
Hung-Chi Chen, Tien-Hung Chen and Chung-Yi Li, National Chiao Tung University, Taiwan; National chiao Tung University, Taiwan; Chang Gung University, Taiwan

12:55PM *Triple-Phase-Shift Control Strategy for Full-Bridge Three-Level (FBTL) DC/DC Converter [#18735]*
Dong Liu, Yanbo Wang, Fujin Deng and Zhe Chen, Aalborg University, Denmark; Southeast University, China

1:20PM *Charge Balance Control for Improving the Load Transient Response [#18484]*
Hung-Yu Chen and Le-Ren Chang-Chien, National Cheng Kung University, Taiwan

1:45PM *A Compact Constant On-time Buck Converter with Analog Transient-optimized On-Time Control and Body Diode Control [#18279]*
Yu Chen Li, Ching Jan Chen and Chieh Ju Tsai, National Taiwan University, Taiwan

Converter Control in Microgrids and Distributed Generation 1

Monday, September 24, 12:30PM-2:10PM, Room: C121, Chair: Stefano Bifaretti, Katherine Kim

12:30PM *AC Voltage Sensorless Method With Bumpless Start for Current-Controlled Converters Connected to Microgrids [#18749]*
Diego Perez-Estevez and Jesus Doval-Gandoy, University of Vigo, Spain

12:55PM *Concurrent Control for Three-Phase Four-Wire Five Levels E-Type Inverter for Microgrids [#19725]*
Marco di Benedetto, Alessandro Lidozzi, Luca Solero, Petar J. Grbovic and Fabio Crescimbini, Roma Tre University, Italy; Huawei Technologies Duesseldorf GmbH, Germany

1:20PM *Single Phase Energy Management System Operating in Islanding Mode with Repetitive Control and Active Damping [#19730]*
Alexander Julian, Giovanna Oriti, Chao Ji and Pericle Zanchetta, Consultant, United States; Naval Postgraduate School, United States; Protean Electric Limited, United Kingdom; University of Nottingham, United Kingdom

1:45PM *Explore the Capability of Power Electronic Converters in Providing Power System Virtual Inertia [#18897]*
Huan Qiu, Jingyang Fang and Yi Tang, Nanyang Technological University, Singapore

Thermal Modelling of Electric Machines 1

Monday, September 24, 12:30PM-2:10PM, Room: B112, Chair: Zbigniew Gmyrek, Konstantinos Gyftakis

12:30PM *Short-Time Transient Thermal Model Identification of Multi-Three Phase Machines [#18762]*
Paolo Pescetto, Simone Ferrari, Gianmario Pellegrino, Enrico Carpaneto and Aldo Boglietti, Politecnico di Torino, Italy

12:55PM *Cooling of Windings in Electric Machines via 3D Printed Heat Exchanger [#19736]*
William Sixel, Mingda Liu, Bulent Sarlioglu and Gregory Nellis, University of Wisconsin-Madison, United States

1:20PM *Permanent Magnets Aging in Variable Flux Permanent Magnet Synchronous Machines [#19078]*
Daniel Fernandez, Maria Martinez, David Reigosa, Juan Manuel Guerrero, Carlos Suarez and Fernando Briz, University of Oviedo, Spain

1:45PM *Comparative Evaluation of Two Water Cooling Methods Used in Permanent Magnet Traction Motors by Combined Electromagnetic-Thermal Analysis [#18931]*
Xinggang Fan, Dawei Li, Ronghai Qu and Cong Wang, Huazhong University of Scicence and Technology, China

IPM Motors 1

Monday, September 24, 12:30PM-2:10PM, Room: B114, Chair: Rajesh Deodhar, Abraham Gebregergis

12:30PM *Large-Scale Electromagnetic Analysis on the K-Computer -Study on Conductor Eddy Current Loss in Bar-Wound Coil of Permanent Magnet Synchronous Motor for Automotive Applications- [#18119]*
Masahiro Aoyama, Ryosuke Akaki, Yoshihiko Sunayama and Masahiko Miwa, SUZUKI Motor Corporation, Japan; JSOL Corporation, Japan

12:55PM *Analytical Calculation of Maximum Mechanical Stress on the Rotor of the Interior Permanent-Magnet Synchronous Machine [#18840]*
Guoyu Chu, Rukmi Dutta and Faz Rahman, The University of New South Wales, Australia

1:20PM *A Novel Dual-Layer PM Variable Flux Hybrid Magnet Memory Machine [#19491]*
Hui Yang, Heyun Lin, Z. Q. Zhu, Shukang Lyu and Ya Li, Southeast University, China; The University of Sheffield, United Kingdom

1:45PM *Partially-Coupled d-q-0 Components of Magnetically-Isolated FSCW IPM Machines in Pre- and Post-Fault Control [#18540]*
Fan Wu and Ayman EL-Refaie, Marquette University, United States

Induction Machines

Monday, September 24, 12:30PM-2:10PM, Room: B118, Chair: Renato Lyra, Luigi Alberti

12:30PM *A Direct Analysis of Induction Motor Using Finite Elements [#19027]*
Matteo Carbonieri and Nicola Bianchi, University of Padova, Italy

12:55PM *Parameter Identification of Induction Motors for Railway Traction Applications [#19219]*
Jing Tang, Yongheng Yang, Lijun Diao, Jie Chen, Yujie Chang and Zhigang Liu, Beijing Jiaotong University, China; Aalborg University, Denmark

1:20PM *Towards an IE4 Efficiency Class for Induction Motors with Minimal Manufacturer Impact [#18648]*
Emmanuel Agamloh, Gerd Bramerdorfer, Zbigniew Gmyrek, Andrea Cavagnino, Luca Ferraris and Silvio Vaschetto, Advanced Energy, United States; Johannes Kepler University Linz, Austria; Technical University of Lodz, Poland; Politecnico di Torino, Italy

1:45PM *An Analytical Iron Loss Calculation Model of Inverter-fed Induction Motors Considering Harmonics [#18311]*
Dongdong Zhang, Shuaijun Chu and Thomas Wu, Xi an Jiaotong University, China; Department of Electrical and Computer Engineerin, United States

Multiphase drives

Monday, September 24, 12:30PM-2:10PM, Room: B113, Chair: Luca Zarri, Juan Manuel Guerrero

12:30PM *A Multiphase Machine and Converter Topology for Renewable Energy Generation [#18432]*
Mupambireyi Ushindibaba, Crane Allan, Ran Li and Mawby Phil, GE Power Conversion, United Kingdom; University of Warwick, United Kingdom

12:55PM *A Simple PWM-based Direct Torque Control for Dual Three-phase Permanent Magnet Synchronous Machine Drives [#19234]*
Yuan Ren, Yun Li, Shiwu Zhu, Zijian Li, Ziqiang Zhu and James E. Green, The University of Sheffield, United Kingdom; Dynex Semiconductor Ltd., United Kingdom

1:20PM *Non - sinusoidal Power Supply Technology Based on Space Vector PWM for Multiphase Variable Speed Drives [#18034]*
Liu Xu and Kong Wubin, Huazhong university of science and technology, China

1:45PM *Diagnosis and Tolerance of Common Faults in Dual Three-phase PMSM Drives [#18578]*
Xueqing Wang, Zheng Wang, Zhixian Xu, Ming Cheng and Yihua Hu, Southeast University, China; University of Liverpool, United Kingdom

Sensorless Control of Electric Drives at Low Speed

Monday, September 24, 12:30PM-2:10PM, Room: B110, Chair: Roberto Petrella, Mario Pacas

12:30PM *Current Angle Adjustment Strategy in Low-Speed Sensorless Drive for Improved Torque Capability over Critical Point [#18529]*
Younggi Lee, Chae-Eun Hwang, Seung-Ki Sul, Mustafa Mohamadian, Lakshmi Narayanan Srivatchan, Daniel R. Luedtke and Nitinkumar Patel, Seoul National University, Korea (South); FCA US LLC, United States

12:55PM *Zero Synchronous Speed Stable Operation Strategy for Speed Sensorless Induction Motor Drive with Virtual Voltage Injection [#18486]*
Wei Sun, Dong Jiang and Ronghai Qu, Huazhong University of Science and Technology, China

1:20PM *Hybrid Sensorless Control of a Interior Permanent Magnet Synchronous Machine using Current Derivative Measurements and a Sliding Mode Observer [#18843]*
Minh Xuan Bui, Rahman Faz and Xiao Dan, M.X. Bui, Australia; M. F. Rahman, Australia; D. Xiao, Australia

1:45PM *Angular Voltage Step Excitation Strategy in Induction Machines for Sensorless Position Estimation Using One Single Active Switching State [#18221]*
Eduardo Rodriguez Montero, Johannes Eberle, Markus Vogelsberger and Thomas Wolbank, Technische Universitaet Wien, Austria; Bombardier Transportation Austria GmbH, Austria

Power modules 1: sensing & monitoring
Monday, September 24, 12:30PM-2:10PM, Room: A105, Chair: Douglas C Hopkins, Fang Luo

12:30PM *Condition monitoring the thermal path degradation of IGBT module using the time constants of junction temperature cooling curves [#18870]*
Yaoyi Yu, Jun Zhang, Xiong Du, Pengju Sun and Heng-Ming Tai, Chongqing University, China; University of Tulsa, United States

12:55PM *Online Aging Parameter Extraction with Peak Voltage veEpeak between the Kelvin and Power Emitter in Turn-off Progress for IGBT Modules [#19421]*
Renju Zheng, Chengmin Li and Wuhua Li, Zhengjiang University, China

1:20PM *Current Sensing Integration with Lead Frames in 6-in-1 IGBT Modules [#19090]*
Minhao Sheng, Hiroyuki Nogawa, Muhammad Alvi and Robert Lorenz, University of Wisconsin-Madison, WEMPEC, United States; Fuji Electic Co., Ltd., Japan

1:45PM *20 MHz Integrated Current Sensing for WBG Systems with EMI Suppression [#18838]*
Minhao Sheng, Muhammad Alvi and Robert Lorenz, UW Madison, WEMPEC, United States

SiC device monitoring & protection
Monday, September 24, 12:30PM-2:10PM, Room: B115, Chair: Bilal Akin, Dong Jiang

12:30PM *Oscillatory False Triggering of Parallel Si and SiC MOSFETs during Short-Circuit Turn-off [#18191]*
Craig Timms, Liang Qiao, Fred Wang, Zheyu Zhang and Dong Dong, University of Tennessee, United States; GE Global Research, United States

12:55PM *SiC Device Junction Temperature Online Monitoring [#19680]*
Ruxi Wang, Juan Sabate, Tomas Sadilek, Peter Losee and Krishna Mainaili, GE Global Research, United States; GE global research, United States

1:20PM *Phase Current Sensor and Shortcircuit Protection based on PCB-embedded Rogowski Coils Integrated in Gate Driver of 1.2 kV 300 A SiC MOSFET Power Module [#18197]*
Slavko Mocevic, Jun Wang, Rolando Burgos, Dushan Boroyevich, Constantin Stancu, Marko Jaksic and Brian Peaslee, Center for Power Electronics Systems, United States; GM Global Propulsion Systems, United States

1:45PM *Novel Bipolar Active Miller Clamp for Parallel SiC MOSFET Power Modules [#19140]*
Eddy Aeloiza, Rostan Rodrigues and Arun Kadavelugu, ABB Inc., United States

Special Session: Smart Transformers: which impact of the SiC technology ?
Monday, September 24, 12:30PM-2:10PM, Room: B116, Chair: Marco Liserre

Monday, September 24, 2:20PM-4:25PM

Wind Energy Sytems
Monday, September 24, 2:20PM-4:25PM, Room: A107, Chair: Alex De Abreu-Garcia, Eduard Muljadi

2:20PM *A new control technique to reduce dynamic effect of unbalanced masses in wind turbine systems [#18104]*
Jishnu Kambrath, Changwoo Yoon and Youyi Wang, NANYANG TECHNOLOGICAL UNIVERSITY, Singapore

2:45PM *Wake Effect on Wind Farm Ability to Participate in Ancillary Service [#18292]*
Dzulfiqar Rais Mushthafa, Le-Ren Chang-Chien and Chien-Hung Lin, National Cheng Kung University, Taiwan; Taiwan Power Research Institute, Taiwan

3:10PM *Centralized Controller of De-loaded Wind Farm for Primary Frequency Regulation [#18370]*
Abdullah Bubshait and Marcelo Simoes, Colorado School of Mines, United States

3:35PM *Comparison of voltage control strategies for wind parks [#18647]*
Shahab Asadollah, Rongwu Zhu and Marco Liserre, Kiel University, Germany

4:00PM *Minimizing The Expected Energy Deficiency of A Distributed Generation System Using Dynamic Optimal Power Management [#19761]*
Salman Harasis, Yilmaz Sozer and Malik Elbuluk, University of Akron, United States

Solid State Transformers and Transformer Applications

Monday, September 24, 2:20PM-4:25PM, Room: B111, Chair: Rajendra Prasad Kandula, Elisabetta Tedeschi

2:20PM *A DC Solid State Transformer with DC Fault Ride through Capability [#18822]*
Haoyuan Weng, Keyan Shi, Min Chen, Philip T. Krein and Dehong Xu, Zhejiang University, China; Zhejiang University, United States

2:45PM *Mobile Utility based Solid State Transformer (MUSE-SST) for MV Grid Interconnection with Gen3 SiC 10 kV MOSFETs [#19402]*
Anup Anurag, Yos Prabowo, Sayan Acharya and Subhashish Bhattacharya, North Carolina State University, United States

3:10PM *Continuous Operation of Smart Transformer-fed Distribution Grid with Single-phase Faults [#19056]*
Zhu Rongwu and Liserre Marco, Chair of Power Electronics, Kiel University, Germany

3:35PM *Isolated Multilevel HVDC Transformer for Off-shore DC Distribution [#19270]*
Amin Rahnama Sadat and Harish Sarma Krishnamoorthy, University of Houston, United States

4:00PM *Active Redundancy in the Low Voltage Stage of Smart Transformers [#19603]*
Victor Ferreira, Markus Andresen, Braz Cardoso and Marco Liserre, Federal University of Minas Gerais, Brazil; University of Kiel, Germany

Protection of Power Systems

Monday, September 24, 2:20PM-4:25PM, Room: B117, Chair: Xiu Yao, John Shen

2:20PM *On the Protection of the Power Flow Control Converter in Meshed Low Voltage DC Networks [#18727]*
Pavel Purgat, Mackay Laurens, Zian Qin and Pavol Bauer, TU Delft, Netherlands

2:45PM *Short Circuit Fault Location in DC Power Networks Using Intelligent SiC Solid-State Circuit Breaker [#18784]*
Yuanfeng Zhou, Yanjun Feng, Tianjiao Liu and Z. John Shen, Illinois Institute of Technology, United States

3:10PM *A Novel Series Arc Fault Detection Method using Sparks in DC Microgrids with Power Electronics Interface [#19397]*
Lu Yue, Vu Le and Xiu Yao, University at Buffalo, United States

3:35PM *A Parameter Identification Approach to Series DC Arc Fault Detection and Localization [#19500]*
Luis Herrera and Xiu Yao, Rochester Institute of Technology, United States; University at Buffalo, United States

4:00PM *A Novel Harmonic-based protection Method for AC Microgrids [#19713]*
Siavash Beheshtaein, Rob Cuzner, Mehdi Savaghebi and Josep Guerrero, Aalborg university, Denmark; University of Wisconsin Milwaukee, United States; Aalborg University, Denmark

Transportation electrification applications

Monday, September 24, 2:20PM-4:25PM, Room: C120, Chair: Antonio J. Marques Cardoso, Mengqi Wang

2:20PM *Stability Analysis of the Electrical Power Generation System for a More Electric Aircraft [#18100]*
Sumeet Singh Thakur, Gabriel Ooi, Souvik Dasgupta, Meng Yeong Lee, Mark Husband and Changyun Wen, Rolls-Royce at NTU Corp Lab, Singapore; Rolls-Royce Electrical, RRSPL, Singapore; Rolls-Royce Electrical, RRPLC, United Kingdom; Nanyang Technological University, Singapore

2:45PM *A Novel Unbalance Compensation Method for High-speed Railway Based on MMC [#18376]*
Jiaxin Yuan, Feiran Xiao, Chenmeng Zhang, Zhou Ni and Yongheng Zhong, Wuhan University, China

3:10PM *Multi-interval DC Traction System Simulator for Stray Current and Rail Potential Distribution [#18494]*
Hao Xue, Xiaofeng Yang, Yuhao Zhou and Trillion Q Zheng, Beijing Jiaotong University, China

3:35PM *The Voltage Difference Control of DCAT Traction Power Supply System for Urban Rail Transit [#18581]*
Miao Wang, Xiaofeng Yang and Trillion Zheng, Beijing Jiaotong University, China

4:00PM *Modeling Dual Active Bridge Converter Considering the Effect of Magnetizing Inductance for Electric Vehicle Application [#19563]*
Saeed Anwar and Daniel Costinett, The University of Tennessee, Knoxville, United States

AC-AC converters 1

Monday, September 24, 2:20PM-4:25PM, Room: B119, Chair: Rostan Rodrigues, Andrea Formentini

2:20PM *A Single-Phase to Two-Phase Power Converter Based on Two-Level and Three-Level Legs [#19687]*
Bruna Seibel Gehrke and Cursino Brandao Jacobina, Federal University of Campina Grande, Brazil

2:45PM *An Improved Model Predictive Dual Current Control Method for Indirect Matrix Converter Fed Induction Motor Drives [#18275]*
Yang Mei and Lisha Chen, North China University of Technology, China

3:10PM *Expansion of FRT Operation Range and Reduction of Grid Current Distortion for Grid-Tied Matrix Converter [#18696]*
Jun-ichi Itoh and Kyota Asai, Nagaoka University of Technology, Japan

3:35PM *Single-Phase AC-DC-AC Multilevel Converter with Transformers Applied to Grid Voltage Compensation [#19160]*
Rodrigo de Lacerda, Edgard Fabricio and Cursino Jacobina, Federal University of Campina Grande, Brazil; Federal Institute of Paraiba, Brazil

4:00PM *Analysis of the Operation of Single-Phase AC-DC-AC Multilevel Five-Leg Converter [#19656]*
Antonio de Paula Dias Queiroz, Cursino Brandao Jacobina and Ayslan Caisson Noroes Maia, Federal Institute of Paraiba, Brazil; Federal University of Campina Grande, Brazil; Federal Institute of Alagoas, Brazil

AC-DC multi-phase 1

Monday, September 24, 2:20PM-4:25PM, Room: C122, Chair: Dong Jiang, Giacomo Scelba

2:20PM *A Zero-Voltage-Switching Three-Phase Four-Wire Four-Leg Rectifier [#18653]*
An Zhao, Keyan Shi, Changsheng Hu and Dehong Xu, Zhejiang University, China

2:45PM *A New Modulation Method for a Bidirectional Isolated Three-Phase AC/DC Dual-Active-Bridge Converter to Realize Higher Efficiency in Wide Output Voltage Range. [#19735]*
Koji Shigeuchi, Jin Xu, Noboru Shimosato and Yukihiko Sato, Chiba University, Japan; Myway Plus Corporation, Japan

3:10PM *A comparison of continuous and discontinuous modulation schemes for a non-isolated single-phase differential-mode Cuk rectifier [#19727]*
Nikhil Gupta and Sudip K Mazumder, University of Illinois, Chicago, United States

3:35PM *Two-phase Interleaved Boost PFC Converter with Coupled Inductor under Single-phase Operation Condition [#18297]*
Chun hui Li, Fei Yang, Yong Cao and Bin Fang, Nanjing University of Science and Technology, China

4:00PM *Multilevel Rectifier Based On Cascaded Transformer With Single DC-Link And Shared Legs [#19138]*
Alan Felinto, Gregory Carlos, Cursino Jacobina and Joao Mello, Federal University of Campina Grande, Brazil; Federal Institute of Alagoas, Brazil

Modeling, Control and Stability of Dual Active Bridge Converter

Monday, September 24, 2:20PM-4:25PM, Room: C121, Chair: Tsorng-Juu Liang, Arijit Banerjee

2:20PM *An Optimized Control Scheme for Reducing Conduction Losses in Dual Active Bridge Converters [#19148]*
Bochen Liu, Pooya Davari and Frede Blaabjerg, Aalborg University, Denmark

2:45PM *A Generalized Modulation Scheme for Soft Switched Dual Active Bridge Converter With Wide Voltage and Power Ranges [#19256]*
Amit Bhattacharjee and Issa Batarseh, UCF, United States

3:10PM *Fast Response Dual Active Bridge Converter with Elimination of Transient DC Offset By Intermediate Asymmetric Modulation [#19258]*
Amit Bhattacharjee and Issa Batarseh, UCF, United States

3:35PM *Unified state-space modeling method for dual-active-bridge converters considering bidirectional phase shift [#18368]*
Haixu Shi, Kai Sun, Hongfei Wu, Yunwei Li and Xi Xiao, Tsinghua University, China; Nanjing University of Aeronautics and Astronauti, China; University of Alberta, Canada

4:00PM *Modelling, Analysis and Mitigation of the Transformer Current Ringing in Dual Active Bridge Converters [#18661]*
Zian Qin, Zhan Shen, Frede Blaabjerg and Pavol Bauer, Delft University of Technology, Netherlands; Aalborg University, Denmark

Modeling and Control of Modular Multilevel Converters 1

Monday, September 24, 2:20PM-4:25PM, Room: A108, Chair: Navid Zargari, Xiaonan Lu

2:20PM *A Novel Discharging Control Strategy for Modular Multilevel Converter Submodules without Using External Circuit [#18800]*
Jianyu Pan, Ziwei Ke, Risha Na and Longya Xu, The Ohio State University, United States

2:45PM *Control of the Hybrid Cascaded Converter based on Distributed Architecture [#18901]*
Yu-chen Su, Ping-heng Wu and Po-tai Cheng, National Tsing Hua University, Taiwan

3:10PM *Improved Balancing and Sensing of Sub-module Capacitor Voltages In Modular Multi-level Converters [#18963]*
Shamkant Joshi, Anshuman Shukla and Mukul Chandorkar, Indian Institute of Technology Bombay, India

3:35PM *Anticipative Sorting Control of Modular Multilevel Converters [#18938]*
Cristian Lascu, Remus Teodorescu and Emanuel Serban, Aalborg University, Denmark; Schneider Electric, Canada

4:00PM *Circulating Current Resonant Oscillation in Modular Multilevel Converters for Variable Frequency Operation and Its Suppression Method [#19536]*
Jianyu Pan and Ziwei Ke, Mr., United States

Ronald Gordon Harley Memorial - Fault Diagnosis

Monday, September 24, 2:20PM-4:25PM, Room: B114, Chair: Thomas Habetler, David Dorrell

2:20PM *Performance Analysis of Dual Wound Permanent Magnet Synchronous Machines under Winding Fault Scenarios [#19678]*
Mohammad Islam, Abraham Gebregergis, Mazharul Chowdhury, Ramakrishnan Raja and Anant Singh, Halla Mechatronics, United States

2:45PM *Impedance-based Induction Motor Bearing Failure Detection Applied to X-Ray Tube [#18177]*
Jayakrishnan Unnikrishnan, Nidhishri Tapadia, John Breunissen and Uwe Wiedmann, Qualcomm New Jersey Research Center, United States; GE Global Research, United States; GE Healthcare, United States

3:10PM *Inter-turn short circuit ratio estimation in IPMSM based on a fault index current and magnet flux linkage observer [#19348]*
Pablo Castro Palavicino, Dheeraj Bobba and Bulent Sarlioglu, University of Wisconsin-Madison, United States

3:35PM *On-line Detection and Classification of Rotor and Load Defects in PMSMs based on Hall Sensor Measurements [#19127]*
Park Yonghyun, Yang Chanseung, Sang Bin Lee, Dongmyung Lee, Daniel Fernandez, David Reigosa and Fernando Briz, Korea University, Korea, Republic of; Hongik University, Korea, Republic of; University of Oviedo, Spain

4:00PM *Simultaneous torque and radial and force ripple control for reduction of acoustic noise in switched reluctance machines [#19755]*
Omer Gundogmus, Mohammed Elamin, Yilmaz Sozer and Akira Chiba, University of Akron, United States; Tokyo Institute of Technology, Japan

Special and Non-Conventional Machines

Monday, September 24, 2:20PM-4:25PM, Room: B118, Chair: Elena Lomonova, Yingjie Li

2:20PM *Rotary-Reciprocating Movement Switched Reluctance Machines with Auxiliary Poles [#19165]*
Parham Hekmati and Ian Brown, Illinois Institute of Technology, United States

2:45PM *A Radial-Force-Based Electromagnetic Wobble Actuator for Low-Speed and High-Torque-Density Applications [#19330]*
Lingyu Chen, Ryosuke Hoshi, Akira Chiba, Masao Nagano and Kimiaki Nakamura, Tokyo Institute of Technology, China; Tokyo Institute of Technology, Japan; Honda Research and Development Co.,Ltd., Japan

3:10PM *A Novel Partitioned-primary Hybrid-excited Flux-switching Linear Machine with Dual-PM [#18022]*
Zhiqiang Zeng and Qinfen Lu, Zhejiang University, China

3:35PM *Double Stator Linear-Rotary Actuator with a Single Set of Mover Magnets [#18984]*
Spasoje Miric, Marcel Schuck, Arda Tuysuz and Johann Walter Kolar, ETH Zurich, Power Electronic Systems Laboratory, Switzerland

4:00PM *A Three-Phase Adjustable-Voltage-Ratio Transformer Based on Magnetic Flux Valves [#19774]*
Junwei Cui, Liyan Qu and Wei Qiao, University of Nebraska-Lincoln, United States

Fault Tolerant Drives and Fault Diagnosis

Monday, September 24, 2:20PM-4:25PM, Room: B110, Chair: Thomas Wolbank, Sang Bin Lee

2:20PM *Ride-Through Capabilities of Electrolytic Capacitor-less Adjustable Speed Drive System During Power Interruptions [#18701]*
Zhentian Qian, Wenxi Yao and Kevin Lee, Zhejiang University, China; Eaton Corporation, United States

2:45PM *Permanent Magnet Synchronous Machine Demagnetization Detection Using Zero-Sequence Magnetic Field Density [#18475]*
David Reigosa, Daniel Fernandez, Maria Martinez, Yonghyun Park, Sang Bin Lee and Fernando Briz, University of Oviedo, Spain; Dept. of Elec. Eng.,Korea University, Seoul, Korea (South)

3:10PM *Multifrequency Current Control for Multiphase Machines With Antiwindup, Distortion-Free Saturation and Full DC-Link Utilization [#18585]*
Alejandro Yepes, Jesus Doval-Gandoy and Hamid Toliyat, University of Vigo, Spain; Texas AM University, United States

3:35PM *Performace Comparison at Maximum Torque per Ampere Control between Rare Earth and Rare Earth Free Five-phase PMa-SynRM under Open Phase Faults [#19653]*
Akm Arafat and Seungdeog Choi, University of Akron, United States

4:00PM *A Novel Stator Current Observer for Fault-Tolerant Control in VSCF System of DFIG [#18698]*
Zhiyong Lan, Li Li, Cheng Deng and Wenxin Yu, Xiangtan University, China; Hunan University of Science and Technology, China

Efficiency Issues in Electric Drives

Monday, September 24, 2:20PM-4:25PM, Room: B113, Chair: Mahesh Swamy, Fernando Briz

2:20PM *Performance Comparison Between Two-Level and Three-Level SiC-Based VFD Applications with Output Filters [#18480]*
Seunghoon Baek, Younghoon Cho, Byung-Geuk Cho and Chanook Hong, Dept. of Electrical Eng. Konkuk University, Korea (South); LS IS Co., Ltd, Korea (South)

2:45PM *A Megawatt-Scale Medium-Voltage High Efficiency High Power Density Hybrid Three-Level ANPC Inverter for Aircraft Hybrid-Electric Propulsion Systems [#19474]*
Di Zhang, Jiangbiao He, Di Pan, Mark Dame and Michael Schutten, GE Global Research, United States

3:10PM *ESC Based Optimal Stator Frequency Control of DFIG-DC System for Efficiency Enhancement [#18445]*
Yan Xiao, Mario Rotea, Yaoyu Li and Babak Fahimi, University of Texas at Dallas, United States

3:35PM *Fast Calculation of the Magnetic Field and Loss Distributions in the Stator Core End Packets and Finger Plates of Large Synchronous Generators [#19398]*
Sufei Li, Cheng Gong, Liang Du, J. Rhett Mayor, Ronald G. Harley and Thomas G. Habetler, Georgia Institute of Technology, United States; Temple University, United States

4:00PM *Optimal Energy Efficiency Evaluation in Induction Machines Driven by Adjustable Speed Drives under EN 50598-2 and IEC 61800-9-1 Standards [#18178]*
Kevin Lee, Eaton, United States

SiC ruggedness & reliability

Monday, September 24, 2:20PM-4:25PM, Room: B112, Chair: Rostan Rodrigues, Victor Veliadis

2:20PM *Impact of the Gate Oxide Reliability of SiC MOSFETs on the Junction Temperature Estimation Using Temperature Sensitive Electrical Parameters [#18660]*
Jose Ortiz Gonzalez and Alatise Olayiwola, University of Warwick, United Kingdom

2:45PM *Surge Current Comparison and Analysis of SiC Schottky Diode and Body Diode of SiC MOSFET [#19003]*
Xi Jiang, Jun Wang, Jianjun Chen, Fanxin Yuan, Zongjian Li, Zhizhi He and Z. John Shen, Hunan University, China

3:10PM *4H-SiC Junction Barrier Schottky Diodes and Power MOSFETs with High Repetitive UIS Ruggedness [#19205]*
Amaury Gendron-Hansen, Dumitru Sdrulla, Avinash Kashyap, Changsoo Hong, Bruce Odekirk, William Brower and Laird Thornhill, Microsemi, United States

3:35PM *Precursors of Gate Oxide Degradation in Silicon Carbide MOSFETs [#19207]*
Ujjwal Karki and Fang Peng, MICHIGAN STATE UNIVERSITY, United States

4:00PM *Non-destructive and destructive short-circuit characterization of a high current SiC MOSFET [#19782]*
Amy Romero and Rolando Burgos, CPES (Virginia Tech), United States

GaN devices & applications

Monday, September 24, 2:20PM-4:25PM, Room: B115, Chair: Hanh-Phuc Le, Jun Wang

2:20PM *Assessment of Switching Frequency Effect on a Compact Three-Phase GaN-Based Inverter Design [#18679]*
Bingyao Sun and Rolando Burgos, Virginia Tech, CPES, United States

2:45PM *Novel monolithic integrated bidirectional GaN HEMT [#18382]*
Carsten Kuring, Oliver Hilt, Mihaela Wolf, Jan Boecker, Joachim Wuerfl and Sibylle Dieckerhoff, Technische Universitaet Berlin, Germany; Ferdinand Braun Institut, Germany

3:10PM *Temperature sensing in GaN Devices using dI/dt [#19742]*
Jianjing Wang and Bernard Stark, University of Bristol, United Kingdom

3:35PM *Characterization of 650 V Enhancement GaN HEMT under Cryogenic Temperature [#18986]*
Ren Ren, Gui Handong, Zhang Zheyu, Chen Ruirui, Niu Jiahao, Wang Fred, M. Tolbert Leon, Costinett Daniel Jes, B. Choi Benjamin and V. Brown Gerald, University of Tennessee, United States; NASA Glenn Research Center, United States

4:00PM *Optimal Dead Time Setting and Loss Analysis for GaN-based Voltage Source Converter [#18956]*
Paige Williford, Edward Jones, Zhe Yang, Jianliang Chen, Fred Wang, Sandeep Bala and Jing Xu, University of Tennessee, United States; Efficient Power Conversion (EPC), United States; ABB, United States

Wireless Power Transfer 1
Monday, September 24, 2:20PM-4:25PM, Room: A105, Chair: Al-Thaddeus Avestruz, Ching-Jan Chen

2:20PM *Wireless Power Transfer System Design Method Considering Inter-dependence of Converters, Coils, and Circuit Operating [#18504]*
Jie Li and Daniel Costinett, University of Tennessee, Knoxville, United States

2:45PM *Coil and Circuit Design of Omnidirectional Wireless Power Transfer System for Portable Device Application [#18464]*
Junjie Feng, Qiang Li and Fred Lee, Center for power Electronics Virginia Tech, United States

3:10PM *Maximum-Efficiency Operation of a 3.7 kW Inductive Wireless Charging System by Using On-Off Keying Modulation [#18673]*
Wenxing Zhong, Hao Li, Hongzhi Cui, S.Y.R. Hui and Dehong Xu, Zhejiang University, China; The University of Hong Kong, Hong Kong

3:35PM *Phase-Shift Control for Two Half-Bridge Resonant Inverter with Parallel Coupled Coils in Induction Heating [#19135]*
Ruan Gomes, Montie Vitorino, Diego Acevedo-Bueno and Mauricio Correa, Federal University of Campina Grande, Brazil

4:00PM *Feasibility study on the all metal induction cooker systems considering topology and control [#18808]*
Eunsu Jang, Sang Min Park, Dongmyoung Joo and Byoung Kuk Lee, Sungkyunkwan University, Korea (South)

Special Session: Smart Transformers: which impact of the SiC technology ?
Monday, September 24, 2:20PM-4:25PM, Room: B116, Chair: Marco Liserre

Monday, September 24, 5:00PM-7:30PM

Plenary Poster Session: Wind Energy Systems
Monday, September 24, 5:00PM-7:30PM, Room: Exhibit Hall A and A1, Chair: Omer Gundogmus, Iftekhar Hasan

P101 *Frequency Coupling Characteristic Modeling of DFIG System based on Type-1 Frequency-locked Loop [#18020]*
Yunyang Xu, Heng Nian and Liang Chen, College of Electrical Engineering Zhejiang Unive, China

P102 *Harmonic Impedance Modeling of DFIG Considering Dead Time Effect of Rotor Side Converter [#18075]*
Chao Wu, Heng Nian, Qi Zhou and Peng Cheng, College of Electrical Engineering, Zhejiang Univ, China; China Electric Power Research Institute, China

P103 *A Prototype 3.2 MW Flux-Switching Permanent Magnet Drive for Large Wind Turbines [#18301]*
Chester Ditmanson, Nils Larsen, Ronny Hein, Peter Hein, Stefan Kolb and Steffen Bernet, Venpower GmbH, Germany; Enasys GmbH, Germany; TU Dresden, Germany

P104 *Multi-winding Flyback Type Snubber for 10kV IGCT with Reduced Voltage Stress on Recovery Diodes [#18813]*
Siamak Shirmohammadi, Amreena Lama Lyngdoh and Yongsug Suh, Chonbuk National University, Korea (South)

P105 *Probability Forecasting of Wind Power Ramp Events Using a Time Series Similarity Search Algorithm [#18952]*
Bo Cao, Liuchen Chang, Xun Gong and Julian Luciano Cardenas Barrera, University of New Brunswick, Canada

P106 *Converting Waste Vehicle Aerodynamic Energy into Electricity [#19212]*
Matthew Penne and Wei Qiao, University of Nebraska-Lincoln, United States

P107 *Wind Turbine Drivetrains: A Glimpse of Existing Technologies [#19523]*
Afshin Izadian, Purdue School of Engineering and Technology, United States

Plenary Poster Session: Renewable Energy Applications

Monday, September 24, 5:00PM-7:30PM, Room: Exhibit Hall A and A1, Chair: Suman Debnath, Madhu Sudhan Chinthavali

P301 *Modular isolated DC/DC converter for MVDC-connected solar energy applications [#18293]*
Jiaxi Chen, Daozhuo Jiang, Rui Yin and Yiqiao Liang, College of EE, Zhejiang university, China

P302 *Control Strategy and Experiment Research on Primary Frequency Regulation for Large Capacity DFIG-Based Wind Turbines [#19614]*
Shiyao Qin, Qiping Zhang, Cun Dong, Mingjie Li and Shaolin Li, China Electric Power Research Institute, China; State Grid Corporation of China, China

P303 *Cascaded Paralleled-Buck Converter with Leakage Current Elimination for Transformerless Photovoltaic Applications [#19351]*
Vagner Fonseca Nobrega and Montie Alves Vitorino, Federal Institute of Paraiba - IFPB, Brazil; Federal University of Campina Grande - UFCG, Brazil

P304 *Low-Voltage Ride-Through for a DFIG Wind Turbine Using Dual-Output of Nine-Switch Inverter [#19343]*
Kennedy Aganah and Olorunfemi Ojo, Tusegee University, United States; Tennessee Tech University, United States

P305 *Modeling and Control for a Photovoltaic Inverter with Power Decoupling on the AC Side [#19151]*
Jianwu Zeng, Junhui Zhao and Taesic Kim, Minnesota State University, Mankato, United States; University of New Haven, United States; Texas AM University-Kingsville, United States

P306 *Active Power Limiter for Static Synchronous Generators in Renewable Applications [#19098]*
Mostafa Abdollahi, Jose Ignacio Candela, Joan Rocabert and Raul Santiago Munoz Aguilar, Technical University of Catalonia UPC SEER, Spain

P307 *Analysis and Control of a Parallel DC Collection System for Wind Turbines with Single Active Bridge Converters [#19026]*
Yu Sang, Adria Junyent-Ferre and Tim C Green, Imperial College London, United Kingdom

P308 *Analysis of Impact on Small Signal Stability of Onshore Wind Integrated VSC HVDC Systems [#18980]*
Nsofwa Kangwa and David Dorrell, University of KwaZulu-Natal, South Africa

P309 *MOSFET-Clamped Three-Level DC-DC Converters for Renewable Energy Resources [#18753]*
Zhilei Yao and Jing Xu, Yancheng Institute of Technology, China

P310 *An Enhanced Damping Control Strategy for Circulating Current Suppression in Modular Multilevel Converters [#18039]*
Rafael Oliveira and Amirnaser Yazdani, Ryerson University, Canada

P311 *Fast and Secure Operation of Voltage Source Inverter based DERs using Model Predictive Droop Control [#19525]*
Waleed Alhosaini and Zhao Yue, University of Arkansas, United States

P312 *A Three-Layer Energy Management and Control System for Wind-PV-Battery Based Microgrid with Model Predictive Controller [#18345]*
GuiBin Li, JieFeng Hu, Kevin K.W Chan and Eric K.W Cheng, The Hong Kong PolyU and Xinjiang University, Hong Kong; The Hong Kong Polytechnic University, Hong Kong

Plenary Poster Session: EV-Grid Interconnection

Monday, September 24, 5:00PM-7:30PM, Room: Exhibit Hall A and A1, Chair: Jiangchao Qin, Li Qi

P501 *Energy Management Strategy of Solar PV-Battery and Diesel Generator Based Electric Vehicle Charging Station [#18145]*
Anjeet Verma and Bhim Singh, Indian Institute of Technology, New Delhi, india, India

P502 *Reliability Oriented Multi-Electrical Vehicle (EV) Charging Strategy Based on EV Load Analysis [#18362]*
Qiyun Dang, McGill Univesity, Canada

P503 *Performance Evaluation and Improvement of Grid Peak-Shaving and Power-Smoothing for Photovoltaic (PV) and Electric Vehicle (EV) Integrated Systems [#18413]*
Wenping Zhang, Katelin Spence, Riming Shao and Liuchen Chang, University of New Brunswick, Canada

P504 *Optimal Scheduling of Spinning Reserve and User Cost in Vehicle-to-Grid (V2G) Systems [#18414]*
Wenping Zhang, Katelin Spence, Riming Shao and Liuchen Chang, University of New Brunswick, Canada

P505 *An Integrated Electrolytic Capacitorless Onboard Charger for Electric Vehicles [#18549]*
Shuai You, Zheng Wang, Yang Xu, Huafeng Xiao and Ming Cheng, Southeast University, China

P506 *Parameters Optimization for Integration of MMC-Based EV Fleet into Smart Grid [#18935]*
Meiqin Mao, Xitao Chen, Yong Ding, Qiang Chen and Liuchen Chang, Hefei University of Technology, China

P507 *Flexibility Scheduling for Microgrids with EV Penetration [#19166]*
Qiyun Dang, Geza Joos and Yuchong Huo, McGill University, China; McGill University, Canada

P508 *A Method for Evaluating Reliability of fast EV chargers by means of Accelerated Testing [#18216]*
Filippo Chimento and Silvestro Bruno, ABB Italy, Power One S.p.a., Italy

Plenary Poster Session: Smart Grid Systems

Monday, September 24, 5:00PM-7:30PM, Room: Exhibit Hall A and A1, Chair: Martin Ordonez, Afshin Izadian

P701 *Discontinuous Modulation based Power Routing for Modular Smart Transformers [#18722]*
Youngjong Ko, Markus Andresen, Levy Costa and Marco Liserre, University of Kiel, Germany

P702 *A Transmission Line Emulator with Integrated Series Compensation Devices [#18781]*
Shuoting Zhang, Jingxin Wang, Fred Wang and Leon Tolbert, The University of Tennessee, United States; the University of Tennessee, United States

P703 *Saving energy by changing the tariff structure and applying flag fees in Brazil [#19253]*
Daniela Wolter Ferreira Touma and Agnelo Marotta, University of South Alabama, United States; Universidade Estadual Paulista, Brazil

P704 *SOC Estimation in Li-ion Batteries Exploiting High-Frequency Model Properties [#19288]*
Pablo Garcia, Angel Navarro-Rodiguez, Sarah Saeed and Jorge Garcia, University of Oviedo, Spain

P705 *Virtual Inertia Emulation using Commercial Off-The-Shelf Inverters [#19395]*
Ujjwol Tamrakar, Andre Luna, Fernando Bereta dos Reis, Dipesh Shrestha, Robert Fourney and Reinaldo Tonkoski, South Dakota State University, United States

P706 *An Adaptive Framework for Mitigating the Current Harmonics Produced by Distributed Energy Resources Using an AC-Stacked Architecture [#19674]*
John Troxler and Robert Cox, UNC Charlotte, United States

P707 *Impact of Transformer Leakage Inductance on the Soft-Switching Solid-State Transformer [#19714]*
Liran Zheng, Mickael Mauger, Karthik Kandasamy, Rajendra Kandula and Deepak Divan, Georgia Institute of Technology, United States

P708 *Augmenting the Traditional Bus-Branch Model for Seismic Resilience Analysis [#19389]*
Vishvas Chalishazar, Brandon Johnson, Ted Brekken and Eduardo Cotilla-Sanchez, Oregon state university, United States; Oregon State university, United States; Oregon State University, United States

P709 *Reliability Analysis of Small Scale DC Microgrid using Stochastic Hybrid System Modeling [#19647]*
Shaheed Mohammad Noor and Choi Seungdeog, University of Akron, United States

P710 *The Steady-State and Fault Ride-Through Strategies of Soft Normally Open Point in Distribution Network [#18973]*
Yuze Li and Zhi Chen, Huazhong University of Science and Technology, China

P711 *A novel filter method to suppress the voltage variations caused by introducing droop control in DC microgrids [#18416]*
Fulong Li, Zhengyu Lin, Alian Chen, Jiande Wu and Cao Wenping, Aston Univerisity, United Kingdom; Aston University, United Kingdom; Shandong University, China; Zhejiang University, China

P712 *Cooperative Control in a Hybrid DC/AC Microgrid Based on Hybrid DC/AC Virtual Generators [#19664]*
Angel Navarro-Rodriguez, Pablo Garcia, Cristian Blanco, Ramy Georgious and Jorge Garcia, University of Oviedo, Spain

Plenary Poster Session: Inductive Power Transfer & Charging Techniques

Monday, September 24, 5:00PM-7:30PM, Room: Exhibit Hall A and A1, Chair: Mohammad Anwar, Shamala Chickamenahalli

P901 *Load-independent ZPA Conditions in Both Constant Current and Constant Voltage Modes of IPT systems [#18123]*
Jiang-Hua Lu, Guo-Rong Zhu, Wen-Jing Li and Bo Li, Wuhan University of Technology, China; Wuhan University of Technology, Chile

P902 *Design and experimental validation of a 50kW IPT for Railway Traction Applications [#18150]*
Irma Villar, Asier Garcia-Bediaga, Ugaitz Iruretagoyena, Ruth Arregi and Pedro Estevez, IK4-IKERLAN, Spain; CAF, Spain

P903 *Expandable N-Legged Converter for Dynamic Wireless Power Transfer [#18485]*
Farzad Farajizadeh, Mahinda Vilathgamuwa, Sampath Prasad and Ledwitch Gerard, Queensland University of Technology, Australia

P904 *Design of an IPT Battery Charger with Double-sided LCC Compensation [#18577]*
Haijun Chu, Xiaohui Qu, Siu chung Wong and Chi kong Tse, Southeast university, China; The Hong Kong polytechnic university, Hong Kong

P905 *Near Field Wireless Power Transfer for Multiple Receivers by A Novel Magnetic Core Structure [#18742]*
Manxin Chen, Ka Wai Eric Cheng and Jiefeng Hu, Dept. of EE,The Hong Kong Polytechnic University, Hong Kong

P906 *Coil Power Density Optimization and Trade-off Study for a 100kW Electric Vehicle IPT Wireless Charging System [#19392]*
Jason Pries, Veda Prakash Galigekere and Omer Onar, Oak Ridge National Laboratory, United States

P907 *Exploration of the Noncommensurate Performance Objective of Bidirectional Vehicle to Grid Resonant Converter based Battery Charger [#18791]*
Olorunfemi Ojo, Tennessee Tech University, United States

P908 *A Novel Grid-Integration Technique for IPT based EV Chargers [#18916]*
Gaurav Kalra, Duleepa Thrimawithana and Martin Neuburger, University of Auckland, New Zealand; Hochschule Esslingen, Germany

P909 *Partial-Power Converter without High Frequency Transformer for Electric Vehicle Fast Charging Stations [#19349]*
Daniel Pesantez, Sebastian Rivera and Samir Kouro, Universidad Tecnica Federico Santa Maria, Chile

P910 *A Current Controller based on SPAACE for Parallel Charging Systems of Energy-Storage Urban Rails [#19399]*
Xiaoyong Zhang, Hang Zhang, Yanhui Zhou, Yun Jiao, Heng Li, Hongtao Liao and Zhiwu Huang, Central South University, China

P911 *Leakage Current Issue of Non-Isolated Integrated Chargers for Electric Vehicles [#19462]*
Yue Zhang, Ge Yang, He Xiaoteng, He Li, Mohamed Elshaer, Chengcheng Yao, Jin Wang, Ke Zou, Zhuxian Xu and Chingchi Chen, The Ohio State University, United States; Ford Motor Company, United States; FORD MOTOR COMPANY, United States

P912 *Design of A Novel High Frequency High Voltage Planar Transformer [#18881]*
Yun Xu, Lixia Chen, Kaiwen He, Siqi Huang and Hongfa Ding, Huazhong University of Science and Technology, China

P913 *Design and Implementation of an Interleaved 6-Level GaN AC-DC Converter for Level II Electric Vehicle Charging [#19544]*
Derek Chou and Robert Pilawa-Podgurski, University of California, Berkeley, United States

P914 *Next Generation Integrated Drive, NGID: A novel approach to thermal and electrical integration of high power density drives in automotive applications [#19768]*
Liliana de Lillo, Behzad Ahmadi, Jorge Espina, Robert Abebe, Lee Empringham and Mark Johnson, University of Nottingham, United Kingdom

P915 *Comparison of Si, SiC, and GaN based Isolation Converters for Onboard Charger Applications [#19660]*
Gui-Jia Su, Oak Ridge National Lab, United States

Plenary Poster Session: DC-DC Converters Poster 1

Monday, September 24, 5:00PM-7:30PM, Room: Exhibit Hall A and A1, Chair: Pradeep Shenoy, Aleksandar Prodic

P1101 *Non-Inverting Three-level Buck-Boost Converter for Wide Output Voltage Range Application [#18472]*
Fang Li, Ruixiang Hao, Xiaojie You and Haodong Lei, Beijing Jiaotong University, China, China

P1102 *Efficiency-Volume Multi-objective Optimization of a High Step-up Interleaved Boost with Coupled Inductor [#18918]*
Wilmar Martinez, Cortes Camilo and Imaoka Jun, KU Leuven, Belgium; Universidad Nacional de Colombia, Colombia; Nagoya University, Japan

P1103 *Multilevel Hysteresis Current Control for Parallel-Form Switch-Linear Hybrid Envelope Tracking Power Supply [#18076]*
Yazhou Wang, Xinbo Ruan, Yang Leng and Ying Li, Nanjing University Of Aero. And Astro., China

P1104 *Nonisolated High Step-Up Soft-Switching DC-DC Converter Integrating Dickson Switched-Capacitor Techniques [#18317]*
Haodong Lei, Ruixiang Hao, Xiaojie You and Fang Li, Beijing Jiaotong University, China

P1105 *A High Step-Up Dual Switches DC-DC Converter with Three-Winding Coupled Inductor and Charge Pump [#18837]*
Koki Takahashi, Atsushi Matsuda, Yuya Nakagawa and Hirotaka Koizumi, Tokyo University of Science, Japan

P1106 *An Optimized, Multiphase Switched-Capacitor DC-DC Converter with Variable-Gain [#18860]*
Marko Krstic and Praveen Jain, Queen's University, Canada

P1107 *A 120V-to-1.8V 91.5%-Efficient 18-W Dual-Inductor Hybrid Converter with Natural Soft-charging Operations for Direct Extreme Conversion Ratios [#19559]*
Ratul Das, Gab-Su Seo and Hanh-Phuc Le, University of Colorado, Boulder, United States

P1108 *A Non-isolated Bidirectional Modular DC-DC Converter with Unipolar and Bipolar Structure for dc Networks Interconnection [#18274]*
Lejia Sun, Fang Zhuo, Feng Wang and Hao Yi, Xi'an Jiaotong University, China

Plenary Poster Session: DC-AC single-phase Poster 1

Monday, September 24, 5:00PM-7:30PM, Room: Exhibit Hall A and A1, Chair: Peter Barbosa, Leon M Tolbert

P1301 *Soft-Switching Techniques for Transformerless Photovoltaic Grid-Connected Inverters [#18070]*
Huafeng Xiao, Zheng Wang and Ming Cheng, Southeast University, China

P1302 *Investigation of Secondary Winding Structure in Multi-Core Transformer in MHz Inverter using Frequency Multiplying [#19454]*
Koji Orikawa, Satoshi Ogasawara, Masatsugu Takemoto and Jun-ichi Itoh, Hokkaido University, Japan; Nagaoka University of Technology, Japan

P1303 *A Novel Calculus Based Unipolar Double Reference Single Carrier PWM for Single Phase T-Multilevel Inverter with Under Modulation (<1) for Renewable Energy Applications: Hardware Implementation [#18033]*
Mahajan Sagar Bhaskar, Sanjeevikumar Padmanaban, Frede Blaabjerg, Muhammad H. Rashid and Dan M. Ionel, University of Johannesburg, South Africa; Aalborg University, Denmark; Florida Polytechnic University, United States; University of Kentucky, United States

P1304 *ZVS transitions in Multi-Mode Single Stage Inverter [#19201]*
Diego Serrano, Regina Ramos, Pedro Alou, Jesus A. Oliver and Jose A. Cobos, Universidad Politecnica de Madrid, Spain

P1305 *Isolated Symmetric Single-Phase Converter with Two DC-links [#19197]*
Nayara Brandao de Freitas and Cursino Brandao Jacobina, Federal University of Campina Grande, Brazil

P1306 *Multicell Multilevel Single-Phase Inverters with Shared Legs and Cascaded Transformers [#19411]*
Joao Paulo Mello and Cursino Jacobina, Federal University of Campina Grande, Brazil

P1307 *A Very High Efficiency Circuit Topology for a Few kw Inverter Based on Partial Power Conversion Principle Suitable for a Wide Band Gap Switching Devices [#19644]*
Atsuo Kawamura, Sakahisa Nagai, Shogo Ito, Satoshi Nakazaki and Hidemine Obara, Yokohama National University, Japan

P1308 *Cascaded H-Bridge Inverters Without Power Regeneration [#19147]*
Amanda Monteiro, Cursino Jacobina, Nayara De Freitas and Joao Mello, Federal University of Campina Grande, Brazil

P1309 *Designing a 40.68 MHz multi-level resonant inverter with eGaN FET for plasma generation [#19484]*
Jungwon Choi and Juan Rivas-Davila, Stanford University, United States

P1310 *Analysis of DC/Single Phase 17-level AC Voltage Steps Converted from Three-phase AC voltages using 12-pulse rectification, Four Cascaded DC voltages, and Inner H-Bridge with a floating capacitor [#18016]*
Masakazu Muneshima, MEIDENSHA CORPOLATION, Japan

Plenary Poster Session: Multi-level converters Poster 7

Monday, September 24, 5:00PM-7:30PM, Room: Exhibit Hall A and A1, Chair: Zach Pan, Fred Wang

P1501 *A New 5-Level Voltage Source Inverter [#18625]*
Ali Ramezani, Apparao Dekka and Mehdi Narimani, McMaster University, Canada

P1502 *Multi-Commutation Loop Induced Over-voltage in High Frequency and Switching Speed Three-Level Active Neutral Point Clamped Phase Leg [#19005]*
Ren Ren, Zhang Zheyu, Liu Bo, Gui Handong, Chen Ruirui, Niu Jiahao, Wang Fred, M. Tolbert Leon, Jes Costinett Daniel, J. Blalock Benjamin, B. Choi Benjamin and V. Brown Gerald, University of Tennessee, United States; NASA Glenn Research Center, United States

P1503 *GaN Modular Multi-Level Inverter fulfilling Next Generation Aerospace Requirements [#19132]*
Mattia Guacci, Dominik Bortis and Johann Walter Kolar, Power Electronic Systems Laboratory - ETH Zurich, Switzerland

P1504 *Zero-Current Switching for the Alternate Arm Converter through On-Load Tap Changers [#18330]*
Harith Roshana Wickramasinghe, Georgios Konstantinou and Josep Pou, UNSW Sydney, Australia; Nanyang Technological University, Singapore

P1505 *High-Frequency Pulsating DC-Link Three-Phase Multilevel NPC Inverter Without Electrolytic Capacitor [#19629]*
Ailton Dutra, Montie Vitorino, Mauricio Correa and Gutemberg Goncalves, Federal University of Campina Grande, Brazil

P1506 *An Enhanced Efficiency MMC Submodule with DC-side Fault Handling Capability and Reduced Voltage Stress for HVDC Transmission Systems [#18038]*
Rafael Oliveira and Amirnaser Yazdani, Ryerson University, Canada

P1507 *Explore the Operating Limit of Cascaded H-Bridge Converters with Uneven Power Distribution [#18465]*
Yang Zezhou, Sun Jianjun, Tang Yi and Zha Xiaoming, Wuhan University, China; Nanyang Technological University, Singapore

P1508 *A Mapping-Based SVM Method for Balancing DC Input Voltage of a NPC Five-Level Inverter [#18542]*
Takumi Sono, Toshiji Kato, Kaoru Inoue and Kaname Tominaga, Doshisha University, Japan

P1509 *Eight-switch Five-level Current Source Inverter [#18776]*
Weiqi Wang, Feng Gao, Yongheng Yang and Frede Blaabjerg, Shandong University, China; Aalborg University, Denmark; Aalborg University, Denmark

P1510 *Optimization of Excitation Waveforms for Multilevel Medium Frequency Transformer [#18819]*
Zhengda Zhang, Lei Zhang, Jiangchao Qin, Qing Duan and Wanxing Sheng, Arizona State University, United States; China Electric Power Research Institute, China

Plenary Poster Session: Modeling and Control of DC-DC Converters

Monday, September 24, 5:00PM-7:30PM, Room: Exhibit Hall A and A1, Chair: Stefano Bifaretti, Koji Orikawa

P1701 *Improving the Transient Response of Voltage-Mode Controller with the Ripple-Based Circuit for On-Chip Buck Converter [#18136]*
Wen-Wei Chen and Jih-Sheng Lai, Virginia Tech, United States

P1702 *A Novel High Resolution DPWM Circuit for High Frequency Digitally Controlled DC-DC Converter [#19368]*
Yudai Furukawa, Hirokazu Nakamura, Haruhi Eto and Fujio Kurokawa, Nagasaki Univercity, Japan; Nagasaki Institute of Applied Science, Japan

P1703 *High-Speed High/Low Pulse Operation by Deadbeat Control Considering Control Delay in Three-Phase Interleaved DC/DC Converter [#18124]*
Yu Hosoyamada, Itsuo Yuzurihara and Atsuo Kawamura, Kyosan Electric MFG. Co., LTD., Japan; Yokohama National University, Japan

P1704 *A Review of Compensator Design for Digital Controller Implementation for DC-DC Converters [#19679]*
Rajat Channappanavar and Santanu Mishra, Indian Institute of Technology Kanpur, India

P1705 *Minimization of Current of a High Gain Dual Active Bridge Converter for Super-capacitor Based Energy Storage System Integration [#19668]*
Samir Hazra and Subhashish Bhattacharya, EPC Power Corp, United States; North Carolina State University, United States

P1706 *Trajectory-Prediction-Based Fast Bidirectional Power Transient Control for Series Resonant Dual-Active-Bridge Converter [#18310]*
Renzhi Duan, Liqiang Yuan, Qing Gu, Jintong Nie and Zhengming Zhao, Dept. of Electrical Engineering, Tsinghua Univ., China

P1707 *Deadbeat Control for Multiphase Interleaved DC-DC Converters [#18694]*
Liang Xian, Qian Zhao and Sandeep Madishetti, Experimental Power Grid Centre (EPGC), Singapore

P1708 *Current-Mode Digital Control Method for High Frequency DC-DC Converter with Reduced Number of Sampling in One Switching Cycle [#18712]*
Atsushi Mishima, Reo Takiguchi, Jun Imaoka, Masahito Shoyama, Akihiro Yamaguchi and Tomonori Kimura, Kyushu University, Japan; DENSO Corporation, Japan

P1709 *Analysis and Design of Fast Transient Response with Current-Mode Adaptive On-Time Control Circuit for On-Chip Buck Converter [#18137]*
Wen-Wei Chen, Jih-Sheng Lai and Chin-Chiang Yah, Virginia Tech, United States; uPI Semiconductor Corporation, Taiwan

P1710 *High efficiency wide input voltage range LCLC resonant converter using nonlinear frequency controller [#19467]*
Bo Sheng, Yang Chen, Hongliang Wang, Yanfei Liu and Paresh C. Sen, Queen's University, Canada

P1711 *Analytical Small-Signal Transfer Functions for Phase Shift Modulated Dual Active Bridge Converters Using Phasor Transformation [#19030]*
Weijian Han and Luca Corradini, Northwestern Polytechnical University, China; University of Padova, Italy

P1712 *A Novel Reduced Voltage Sensor-Count Control of a DC/DC Converter Utilizing MPPT Algorithm [#19243]*
Zakariya Dalala and Osama Saadeh, German Jordanian University, Jordan

P1713 *An Enhanced Multi-frequency Small-signal Model for the Close-loop Design in Buck Converters [#18871]*
Xiangpeng Cheng, Jinjun Liu, Zeng Liu, Teng Liu and Danhong Xue, Xi'an Jiaotong University, China

P1714 *A New Maximum Efficiency Point Tracking Technique for Digital Power Converter with Dual Parameters Control [#19406]*
Xi Chen, Anirudh Pise, John Elmes and Issa Batarseh, University of Central Florida, United States; Advanced Power Electronics Corporation, United States

Plenary Poster Session: Modeling and Control of DC-AC Converters

Monday, September 24, 5:00PM-7:30PM, Room: Exhibit Hall A and A1, Chair: Brandon Grainger, Dong Dong

P1901 *Master-Slave Control of Parallel-Operated Interfacing Inverters Based on Digital Wireless Communication [#18449]*
Dong Li and Carl Ngai Man Ho, University of Manitoba, Canada

P1902 *Pade'-based-Repetitive Learning Current-Control for Voltage Source Inverters [#19193]*
Valerio Salis, Alessandro Costabeber, Tardelli Francesco, Cox Stephen, Zanchetta Pericle, Bifaretti Stefano and Verrelli Cristiano Maria, The University of Nottingham, United Kingdom; Universita' di Roma Tor Vergata, Italy

P1903 *Small-Signal Model of Parabolic Current Control [#19596]*
Lanhua Zhang, Texas Instruments, United States

P1904 *Voltage Sensorless Control of a Three-Phase Standalone Inverter Based on Internal Model Principle [#18829]*
Sara Yazdani and Mehdi Ferdowsi, Missouri University of Science and Technology, United States

P1905 *DC-link Ripple Reduction in a DPWM-based Two-Level VSI [#18147]*
Tcai Anatolii and Kyo-Beum Lee, Ajou University, Russia; Ajou University, Korea (South)

P1906 *Implementation of a Voltage Sensor-less Current-Control Technique Based on Internal Model Principle with Xilinx System Generator [#18326]*
Sara Yazdani and Mehdi Ferdwosi, Missouri University of Science and Technology, United States

P1907 *Evaluation of Voltage Controllers Based on Active Damping for the CVCF Power Converter under Nonlinear Load Condition [#18048]*
Jianxin Zhu, Li Zhang, Rui Zhao, Fan Wu and Yan Xing, Nanjing University of Aeronautics Astronautics, China; Hohai University, China

P1908 *An enhanced droop control algorithm for direct paralleled DC-AC inverters [#18737]*
Duo Wang, Lijun Zhang, Jiaming Zhang, Xuqiang Zhao and Xianqi Lin, CRRC Qingdao Sifang Rolling Stock Research Inst., China

P1909 *Inherent Damping Design for LCL Grid-tied Inverter to Avoid Harmonic Instability in Multi-parallel Operation [#18371]*
Tong Chen, Chi Kwan Lee and S.Y.Ron Hui, The University of Hong Kong, Hong Kong

P1910 *Influence of DC Link Capacitance on Power Efficiency of Single-Phase Inverter [#18798]*
Yi Liu, Huai Wang, Meng Huang and Xiaoming Zha, Energy Department, Denmark; School of Electrical Engineering, China

P1911 *High Temperature Design Optimisation of DC/AC Power Converters using SiC BJTs [#19422]*
Ian Laird, Xibo Yuan, Bosen Jin and Neville McNeill, University of Bristol, United Kingdom; University of Strathclyde, United Kingdom

Plenary Poster Session: Modeling and Control of AC-DC Converters

Monday, September 24, 5:00PM-7:30PM, Room: Exhibit Hall A and A1, Chair: Luca Solero, Andrea Formentini

P2101 *Small-Signal Modeling and Controller Design Considerations for Dyna-C AC-DC Converter [#19066]*
Adrian Wiemer, Vishnu Mahadeva Iyer, Arne Hinz, Subhashish Bhattacharya and Rik W. De Doncker, RWTH Aachen University, Germany; North Carolina State University, United States

P2102 *Control of a three phase boost rectifier under unbalanced grid conditions without grid voltage sensors [#19173]*
Subhajyoti Mukherjee and Jonathan Kimball, Missouri University of Science and Technology, United States

P2103 *Synchronous Rectifier Control Algorithm to Improve Efficiency of Full-Bridge Converter with Asymmetric PWM Control [#18154]*
Tae-Ho Bang, Sun-Ho Lee and Jung-Wook Park, Yonsei University, Korea (South)

P2104 *A New Hybrid Switching Frequency Control for Resonant Converter with Fast Dynamic Response [#18554]*
Yen-Shin Lai and Min-Hsiang Yu, National Taipei University of Technology, Taiwan

P2105 *A Reduced Order Generalized Proportional Integral Observer based DC Link Voltage Control Strategy for Three-phase AC/DC Converter [#18552]*
Jinghang Lu, Mehdi Savaghebi and Josep Guerrero, Aalborg University, Denmark

P2106 *A new relative droop-gain based current sharing and voltage regulation method of DC side parallel connected rectifiers [#18102]*
JIan Zhang and Xuhui Wen, Institute of Electrical Engineering,CAS, China

P2107 *Multi-modes Hybrid Power Control Strategy for LCC Resonant Capacitor Charging Power Supply [#18878]*
Yun Xu, Chao Lu, Kaiwen He, Lixia Chen and Hongfa Ding, Huazhong University of Science and Technology, China

P2108 *Analysis of Voltage Stress Auto-Balance Characteristic for Half-Bridge Three-Level LLC Resonant Converter with Clamped Diodes and Flying-Capacitor [#18996]*
Lin Shi, Bangyin Liu and Shanxu Duan, HuaZhong University of Science and Technology, China; Huazhong University of Science and Technology, China

Plenary Poster Session: General Topics and Induction Machines

Monday, September 24, 5:00PM-7:30PM, Room: Exhibit Hall A and A1, Chair: Andrea Cavagnino, Rashmi Prasad

P2301 *Study of Rotor Endturn Flow in Large Synchronous Generators [#19001]*
Ke Xiao and J.Rhett Mayor Mayor, Georgia Institute of Technology, United States

P2302 *A Universal Method to Minimize Space Harmonics of Fractional Slot Concentrated Windings in AC Machines [#19331]*
Md Sariful Islam, Md Ashfanoor Kabir, Rajib Mikail and Iqbal Husain, North Carolina State University, United States; ABB Inc., United States

P2303 *Accurate Joule Loss Estimation for Rotating Machines: An Engineering Approach [#19646]*
Adeeb Ahmed and Iqbal Husain, North Carolina State University, United States

P2304 *Comparison of PWM and Sinusoidal excitation conditions of Induction Machines [#18892]*
Boglietti Aldo, Armando Eric and Agamloh Emmanuel, Politecnico di Torino, Italy; Advanced Energy, United States

P2305 *A Technical Arrangement of High Performance Techniques Realized by Multi-Phase Permanent Magnet Synchronous Motor Systems [#18344]*
Yoshihiro Miyama and Kan Akatsu, Mitsubishi Electric Corporation, Japan; Shibaura Institute of Technology, Japan

P2306 *Comparison of AC Motors to an Ideal Machine Part I-Conventional AC Machines [#18435]*
Thomas Lipo and Wenbo Liu, University of Wisconsin, United States

P2307 *Design Optimization and Performance Investigation of Novel Double-slit Secondaries for Linear Induction Motors [#18685]*
Jiawen Zhan and Qinfen Lu, Zhejiang University, China

P2308 *A Simple and Efficient State-space Model of Induction Machines with Interconnected Windings Including Space Harmonics [#19169]*
Julien Cordier and Ralph Kennel, Technische Universitaet Muenchen, Germany

P2309 *Estimator of the Rotor Temperature of Induction Machines Based on Parameter Identification Method [#18295]*
Haisen Zhao, Pengyu Li, Yang Zhan, Guorui Xu and Xueshen Cui, North China Electric Power University, China; Tianjin University, China

P2310 *Small-Signal Finite Element Simulation of an Induction Machine [#19000]*
Omar Bottesi and Luigi Alberti, Free University of Bozen-Bolzano, Italy; University of Padova, Italy

P2311 *Twelve-Phase Induction Machine Analysis With Harmonic Injection [#19633]*
Isaac Soares de Freitas, Italo Roger Ferreira Moreno Pinheiro da Silva, Zariff Meira Gomes and Elves Sousa e Silva, Federal University of Paraiba, Brazil; Federal Rural University of Pernambuco, Brazil; VEDECOM, France

P2312 *Shaping Induction Machine Rotor Slots for Reduced Losses during Torque Transients [#19070]*
Yuying Shi and Robert Lorenz, University of Wisconsin-Madison, WEMPEC, United States

Plenary Poster Session: IPMSM and Synchronous Reluctance Machines

Monday, September 24, 5:00PM-7:30PM, Room: Exhibit Hall A and A1, Chair: Marcello Pucci, Rashmi Prasad

P2501 *Investigation of PMASynRM with Dy-free Bonded Magnets for Traction Applications Considering Irreversible Demagnetization [#18571]*
Marika Kobayashi, Shigeo Morimoto, Masayuki Sanada and Yukinori Inoue, Osaka Prefecture University, Japan

P2502 *Comparative Analysis of Six-Step and Vector Controlled IPMSM under Inter-Turn Fault [#19105]*
Zia Ullah and Jin Hur, Incheon university, korea, Korea (South)

P2503 *Synchronous Reluctance Motor Iron Losses: Analytical Model and Optimization [#18909]*
Hanafy Mahmoud, Michele Degano, Giacomo Bacco, Nicola Bianchi and Chris Gerada, University of Nottingham, United Kingdom; Padova University, Italy

P2504 *A Fault Tolerant PMA SynRM Drive with Mixed Pitch Segregated Windings [#18490]*
Bo Wang, Jiabin Wang and Antonio Griffo, The University of Sheffield, United Kingdom

P2505 *Comparison between Assisted and Dual Phase synchronous reluctance machines for high speed applications [#18869]*
Leila Nguimpi Langue, Guy Friedrich, Stephane Vivier, Khadija El Kadri and Iman Kleilat, Universite de technologie Compiegne, France

P2506 *The Emergence of Two Speed Line Start Synchronous Motors [#18536]*
Ebrahim Amiri, Aliakbar Damaki and Oleksandr Dobzhanskyi, University of New Orleans, United States; Yazd University, Iran; American University, Iraq

P2507 *Transient Demagnetization Characteristics of Permanent Magnet Synchronous Machines with Stator Inter-Turn Short Circuit Faults for Automotive Applications [#18054]*
Shen Zhang, Georgia Institute of Technology, United States

P2508 *Investigation on IPMSM Machines with Dy-free Magnets and Magnets recycling Concept for Hybrid Electrical Vehicle Applications [#18314]*
Ziwei Li, Afef Kedous Lebouc, Jean-Marc Dubus, Jerome Legranger and Radu Fratila, Grenoble INP/Valeo, France; Univ. Grenoble Alpes, CNRS, G2Elab, Grenoble INP, France; Valeo, France

P2509 *Wireless Torque Pulsations Measurement System for PMSMs [#19216]*
Maria Martinez, Daniel Fernandez, David Reigosa, Juan Manuel Guerrero and Fernando Briz, University of Oviedo, Spain

P2510 *On PMSM Model Fidelity and its Implementation in Simulation [#18510]*
Haiwei Cai and Dakai Hu, ANSYS, Inc., United States; MathWorks, Inc., United States

P2511 *Performance review of permanent magnet assisted synchronous reluctance traction motor designs [#19628]*
Sai Sudheer Reddy Bonthu, Zakirul Islam and Choi Seungdeog, Cincinnati Incorporated, United States; University of Akron, United States

Plenary Poster Session: Sensorless Drives and High Speed Drives

Monday, September 24, 5:00PM-7:30PM, Room: Exhibit Hall A and A1, Chair: Michael Harke, Jul-Ki Seok

P2701 *Decoupling Control for Parallel Drive No-Voltage Bearingless Motors [#19200]*
Renato Amorim Torres and Eric Severson, University of Wisconsin-Madison, United States

P2702 *Nonlinear Adaptive Backstepping Control-Based Dynamic Recurrent RBFN Uncertainty Observer for High-Speed Micro Permanent-Magnet Synchronous Motor Drive System [#18666]*
Fayez El-Sousy and Khaled Abuhasel, Prince Sattam bin Abdulaziz University, Saudi Arabia; University of Bisha, Saudi Arabia

P2703 *Rotor Dynamic Analysis of Ultra-high Speed Switched Reluctance Machines over 1 Million rpm [#19180]*
Cheng Gong, Sufei Li and Thomas Habetler, Georgia Institute of Technology, United States

P2704 *Simple and Effective Position Estimation Error Compensation Method for Sensorless SPMSM Drives [#18499]*
Hechao Wang, Kaiyuan Lu, Dong Wang and Frede Blaabjerg, Aalborg University, Denmark

P2705 *A Sensorless V/f Control Technique based on MTPA Operation for PMSMs [#18628]*
Won-Jae Kim and Sang-Hoon Kim, Kangwon National University, Korea, Republic of

P2706 *SiC MOSFET Based Power Module Design and Analysis for EV Traction Systems [#19357]*
Emre Gurpinar, Randy Wiles, Tsarafidy Raminosoa, Burak Ozpineci, Feng Zhou, Yanghae Liu and Ercan Dede, Oak Ridge National Laboratory, United States; Toyota Research Institute of North America, United States

P2707 *Sensorless Harmonic Estimation for Servo Drive System with Vibrational Load [#18697]*
Ching-Lon Huang, Shih-Chin Yang and Yi-Hsun Lee, National Taiwan University, Taiwan; LiteOn Technology Corporation, Taiwan

P2708 *Position Sensorless Drive of High Speed Permanent Magnet Synchronous Motor [#18982]*
Yu Yao, Fei Peng and Yunkai Huang, Southeast University, China

P2709 *FPGA Implementation of an Arbitrary Injection based Sensorless Control for PMSM [#18879]*
Zhe Chen, Hang Zhang, Wencong Tu, Bo Tan and Guangzhao Luo, Northwestern Polytechnical University, China

P2710 *Discrete-Time Current Control of Modular Multilevel Converter for Medium Voltage High Power High-Speed PMSM [#18941]*
Tianqi Xia, Yunkai Huang, Fei Peng and Yu Yao, Southeast University, China

P2711 *Position Sensorless Control of Switched Reluctance Motor Drives Without Pre-stored Magnetic Characteristics [#19387]*
Jongwan Kim, Jung-Muk Choe, Seungryul Moon and Jih-Sheng Lai, Virginia Polytechnic Institute and State Univ., United States

P2712 *Self-Sensing via Flux Injection with Servo Dynamics including a Smooth Transition to Back-EMF Tracking [#18990]*
Huthaifa Flieh, Timothy Slininger, Eigo Totoki and Robert D. Lorenz, University of Wisconsin Madison , WEMPEC, United States; Mitsubishi Electric Corporation, Japan

Plenary Poster Session: Efficiency issues and faults in electric drives

Monday, September 24, 5:00PM-7:30PM, Room: Exhibit Hall A and A1, Chair: Michael Harke, Jul-Ki Seok

P2901 *Open Circuit Fault Diagnosis of Rotating Rectifier based on the Polarity and Symmetry of Armature Current [#18287]*
Zhihuang Wei, Weiguo Liu, Ji Pang, Ningfei Jiao and Chenghao Sun, Northwestern Polytechnical University, China

P2902 *Performance Comparison of Stator Winding Connections in Multiphase Drives Under Open Converter Leg [#18164]*
Alejandro Yepes, Jesus Doval-Gandoy, Fernando Baneira and Hamid Toliyat, University of Vigo, Spain; Texas AM University, United States

P2903 *Efficient Calculation of the Strand Eddy Current Loss Distributions in the End Stepped-Stator Region of Large Synchronous Generators [#19472]*
Sufei Li, Cheng Gong, J. Rhett Mayor, Ronald G. Harley and Thomas G. Habetler, Georgia Institute of Technology, United States

P2904 *Common Mode Voltage Reduction Method for H7 Inverter Using DPWM Offset Based Modulation Technique [#18688]*
Seung-Hwan Lee, Jun-Hyung Jung, Seon-Ik Hwang, Hyun-Jin Jo and Jang-Mok Kim, Pusan National University, Korea, Republic of; Agency for Defense Development, Korea, Republic of

P2905 *Application of Active Gate Driver in Variable Frequency Drives [#19448]*
Sam Cherati, Nandini Ganesan and Rangarajan Tallam, Rockwell Automation/Allen-Bradley, Mequon, WI, U, United States

P2906 *Common-mode EMI Noise Modeling and Reduction using Balance Technique for AC-DC-AC Traction Systems with Paralleled Power Modules [#19670]*
Le Yang, Hui Zhao and Shuo Wang, University of Florida, United States

P2907 *Development of High-Frequency GaN-HEMT Power Modules with Reverse-Voltage-Blocking Capability for an Integrated Motor Drive using a Current-Source Inverter [#19588]*
Hang Dai, Thomas Jahns, Steven Chang, Renato Torres, Mingda Liu and Bulent Sarlioglu, University of Wisconsin-Madison, United States

P2908 *Bus Conditioner Discharge Circuit in Floating Ground System Applications [#18041]*
Ripunjoy Phukan, Jiangang Hu, Jim Ulrich and Lixiang Wei, Rockwell Automation, United States

P2909 *A Design Investigation of A 1MVA SiC MOSFET Medium Voltage Variable Frequency Drive With Various Filtering Options [#19356]*
Hanning Tang and Alex Huang, The University of Texas at Austin, United States

P2910 *Study of a Silicon Carbide MOSFET Power Module to Establish the Benefits of Adding Anti-parallel Schottky Diodes [#19705]*
Andrew Trentin, David Hind, Marco Degano, Christopher Tighe, Saul Lopez Arevalo, Yang Li, Mark Johnson, Pat Wheeler, Christopher Gerada, Anne Harris and Matthew Packwood, University of Nottingham, United Kingdom; Dynex Semiconductor Ltd, United Kingdom

Plenary Poster Session: WBG devices & applications 1

Monday, September 24, 5:00PM-7:30PM, Room: Exhibit Hall A and A1, Chair: Khurram Afridi, Babak Parkhideh

P3101 *Development of Simulink Based Modeling Platform for 3.3 kV/400 A SiC MOSFET Module [#18037]*
Muhammad Nawaz, Nikolaos Bezentes, Kalle Ilves and Francesco Iannuzzo, ABB Corporate Research, Vaasteras, Sweden; Institut for Energiteknik, Aalborg University,, Denmark

P3102 *Limits of SiC MOSFETs' Parameter Deviations for Safe Parallel Operation [#18157]*
Teresa Bertelshofer and Mark-M. Bakran, University of Bayreuth, Germany

P3103 *Understanding of Decoupling Capacitance Selection for SiC Based Voltage Source Converter Considering Short-Circuit Fault Conditions [#18192]*
Craig Timms, Liang Qiao, Fred Wang, Zheyu Zhang and Dong Dong, University of Tennessee, United States; GE Global Research, United States

P3104 *A Passive Component Based Gate Drive Scheme for Negative Gate Voltage Spike Mitigation in a SiC-Based Dual-Active Bridge [#18288]*
Yidong Tian, Ruiliang Xie, Xiang Hao, Xu Yang, Lang Huang, Tao Liu and Jianpeng Wang, Xi'an Jiaotong University, China; New Energy Research Institute of TBEA, China

P3105 *Effects of the Device Parameters and Circuit Mismatches on the Static and Dynamic Behavior of Parallel Connections of Silicon Carbide MOSFETs [#18391]*
Maurizio Melito, Massimo Nania, Gionatan Montoro and Angelo Raciti, STmicroelectronics, Italy; University of Catania, Italy

P3106 *Impact of SiC MOSFET on PV Inverter [#18412]*
Junxiong Wu, Ning He and Dehong Xu, Zhejiang University, China

P3107 *SiC MOSFET Based LCL Grid-Connected Inverter with Double Closed-Loop Control [#18513]*
Jin Dianheng, Liu Yitao, Yin Jian, Pan Xuewei and Peng Jianchun, Shenzhen University, China; Harbin Institute of Technology, China

P3108 *Accurate Analytical Switching Loss Model for High Voltage SiC MOSFETs Includes Parasitics and Body Diode Reverse Recovery Effects [#18598]*
Soheila Eskandari, Kang Peng and Enrico Santi, University of South Carolina, United States; Infineon, United States

P3109 *Safe-Operating-Area of Snubberless Series Connected Silicon and SiC power devices [#18804]*
Zarina Davletzhanova, Layi Alatise, Jose Ortiz-Gonzalez, Roozbeh Bonyadi, Tianxiang Dai and Chun Wa Chan, University of Warwick, United Kingdom; Jaguar Land Rover, United Kingdom

P3110 *Optimization of Delay Time between Gate Signals for Si/SiC Hybrid Switch [#18805]*
Zhengda Zhang, Lei Zhang and Jiangchao Qin, Arizona State University, United States

P3111 *Impact of Body Diode and Anti-parallel JBS Diode on Switching Performance of 3rd Generation 10 kV SiC MOSFET [#18831]*
Xingxuan Huang, Shiqi Ji, Jingjing Sun, Sheng Zheng, Fred Wang, Leon Tolbert, Marko Laitinen and William Giewont, University of Tennessee, Knoxville, United States; Oak Ridge National Laboratory, United States; Danfoss Inc., United States

P3112 *Analysis of Transient Gate-Source OverVoltages in Silicon Carbide MOSFET Power Devices [#18899]*
Mario Pulvirenti, Gionatan Montoro, Massimo Nania, Rosario Scollo, Giacomo Scelba, Mario Cacciato and Giuseppe Scarcella, STMicroelectronics, Italy; STmicroelectronics, Italy; University of Catania, Italy

P3113 *Comparison of Voltage Source Inverters Using SiC Schottky Diode and Synchronous Rectification [#19263]*
Cheng Zeng, Jun Wang, Zongjian Li, Fanxin Yuan, Zhizhi He and Z.John Shen, Hunan University, China

Plenary Poster Session: WBG devices & applications 2

Monday, September 24, 5:00PM-7:30PM, Room: Exhibit Hall A and A1, Chair: Subhashish Bhattacharya, Ravi Raju

P3301 *Coordinated On-line Junction Temperature Estimation and Prognostics of SiC Power Modules [#19617]*
Fausto Stella, Gianmario Pellegrino and Eric Armando, Politecnico di Torino, Italy

P3302 *Impact of power module parasitic capacitances on switching losses in medium voltage fast switching applications [#19686]*
Dipen Narendra Dalal, Nicklas Christensen, Asger Bjorn Jorgensen, Simon Dyhr Sonderskov, Christian Uhrenfeldt, Szymon Beczkowski, Stig Munk - Nielsen and Subhashish Bhattacharya, North Carolina State University, United States; Aalborg University, Denmark

P3303 *Dynamic Performance of 600 V GaN and SiC Schottky Diodes [#18035]*
Nasser Badawi, Lempidis Georgios and Heinbokel Bjoern, Valeo Siemens eAutomotive Germany, Germany; Valeo Siemens eAutomotive Gemany, Germany; Technical Universtiy of Berlin, Germany

P3304 *Paralleled GaN HEMTs Loss Distribution Analysis for High-power Applications [#18664]*
Juncheng(Lu) Lu, Ruoyu Hou and Di Chen, GaN Systems,Inc, Canada

P3305 *An Ultrafast Discrete Short-Circuit/Over-Current Protection Circuit for GaN HEMTs [#18828]*
Ruoyu Hou, Juncheng Lu and Di Chen, GaN Systems Inc., Canada

P3306 *GaN Power Switches: A Comprehensive Approach to Power Loss Estimation [#19435]*
Matthieu Amyotte, Ettore Scabeni Glitz, Celeste Garcia Perez and Martin Ordonez, University of British Columbia, Canada

P3307 *Analysis of Optimal Operation Conditions for GaN-based Power Converters [#19591]*
Ander Avila, Asier Garcia-Bediaga, Alberto Rodriguez, Luis Mir and Alejandro Rujas, IK4-IKERLAN TECHNOLOGY RESEARCH CENTRE, Spain; IK4-IKERLAN Technology Research Centre, Spain; Universidad de Oviedo, Spain

P3308 *Using the Case Temperature Cooling Curves to Monitor the Thermal Impedance of IGBT Module and TIM [#18725]*
Jun Zhang, Xiong Du, Shuai Zheng, Pengju Sun and Heng-Ming Tai, Chongqing University, China; University of Tulsa, United States

P3309 *A high power density and high efficiency three phase inverter based on a hybrid 3D SiC packaging power module [#19439]*
Zhizhao Huang, Teng Liu, Yifan Tan, Yuxiong Li, Cai Chen, Yong Kang and Fang Luo, Huazhong University of Science and Technology, China; University of Arkansas, United States

P3310 *Continuous Heat Run Test of Latest Generation Power Modules for 10kV 4H-SiC MOSFETs in Medium Voltage Power Converters [#19691]*
Ashish Kumar, Sanket Parashar and Subhashish Bhattacharya, North Carolina State University, United States

P3311 *Diamond Schottky barrier diodes for power electronics applications [#19108]*
Gaetan Perez, Aurelien Marechal, Nicolas Rouger, Juliette Letellier, David Eon and Gauthier Chicot, Universite Grenoble Alpes, CNRS, G2Elab, F-38000, France; Universite de Toulouse, LAPLACE, CNRS, INPT, UPS, France; Universite Grenoble Alpes, CNRS, Institut Neel,, France

P3312 *Investigation of a parasitic-inductance reduction technique for through-hole packaged power devices [#19354]*
Harry Dymond and Bernard Stark, University of Bristol, United Kingdom

P3313 *Emerging GaN Power Devices for Efficient and Compact Power Conversion [#19605]*
Ahmed Elasser, Mohammed Agamy, Ramanujam Ramabhadran and Kum-Kang Huh, GE Global Research Center, United States; GE global research center, United States

Plenary Poster Session: Emerging Technologies and Applications (I)

Monday, September 24, 5:00PM-7:30PM, Room: Exhibit Hall A and A1, Chair: Huai Wang, Dong Cao

P3501 *Phase Synchronization of Control Signals Based on Perturbation and Observation for Bidirectional Wireless Power Transfer System [#18825]*
Fang Liu, Kainan Chen, Zhengming Zhao and Kai Li, Tsinghua University, China

P3502 *A Soft -Switching Active Energy Injection Converter for Magnetic Resonant Wireless Power Transfer Applications [#18888]*
Zhipeng Zheng and Liangzong He, Xiamen University, China

P3503 *Modeling of Mutual Inductance for Hexagonal Coils with Horizontal Misalignment in Wireless Power Transfer [#18498]*
Ping-an Tan, Fu Yi and Chunxia Liu, Xiangtan University, China

P3504 *Modeling and Implementation of Switching Control for Multi-transmitter Wireless Power Transfer [#18526]*
Ping-an Tan, Tao Peng and Saiqi Cao, Xiangtan University, China

P3505 *Maximum Efficiency Tracking for Dynamic Wireless Power Transfer System Using LCC Compensation Topology [#18280]*
Xiufang Hu, Yue Wang, Yongbin Jiang, Wanjun Lei and Xiaoshuai Dong, Xi'an Jiaotong University, China; Xi'an jiaotong University, China; XJ GROUP CORPORATION, China

P3506 *First order frequency-domain analytical model for resonant converters in CCM [#18096]*
Hulong Zeng and Fang Z. Peng, Michigan State University, United States

P3507 *Double-layer Shielding Method for Point Field Detection-based Current Sensing [#19689]*
Mohammad Nari, Aptiv, United States

P3508 *Soft-Start Control Method for In-motion Charging of Electric Vehicles Based on Transient Analysis of Wireless Power Transfer System [#18161]*
Katsuhiro Hata, Takehiro Imura, Hiroshi Fujimoto and Yoichi Hori, The University of Tokyo, Japan

P3509 *Energy Harvesting for Power Transmission Online Monitoring [#19593]*
Jia Long Qu and Chi Kwan Lee, The University of Hong Kong, Hong Kong

P3510 *Planar Printed-Circuit-Board (PCB) Resonator Design for Domino-Resonator Wireless Power Transfer (WPT) System [#19594]*
Jia Long Qu and Chi Kwan Lee, The University of Hong Kong, Hong Kong

Tuesday, September 25, 8:30AM-10:10AM

Health and Condition Monitoring of Energy Storage Systems

Tuesday, September 25, 8:30AM-10:10AM, Room: A107, Chair: Ahmed Elasser, Mithat Kisacikoglu

8:30AM *Online Condition Monitoring of Sealed Lead Acid and Lithium Nickel-Cobalt-Manganese Oxide Batteries using Broadband Impedance Spectroscopy [#18107]*
Olakunle Alao and Paul Barendse, University of Cape Town, South Africa

8:55AM *Cell Failure Evaluations under Environmental and Safety Tests of Multiple 18650 Li-Ion NCA and NMC cells for Space Cells Qualification Establishment [#18224]*
Jonghoon Kim, Seongjun Lee and Woonki Na, Chungnam National University, Korea, Republic of; Chosun University, Korea, Republic of; California State University, Fresno, United States

9:20AM *A Non-Linear Electrical Model for Iron Doped Sodium Metal Halides Batteries [#18792]*
Alfonso Damiano, Mauro Boi, Andrea Salimbeni and Daniele Battaglia, University of Cagliari, Italy

9:45AM *Time-Frequency Analysis of the Chirp Response for Rapid Electrochemical Impedance Estimation [#18012]*
Fabusuyi Aroge and Paul Barendse, University of Cape Town, South Africa

Microgrid Control-II

Tuesday, September 25, 8:30AM-10:10AM, Room: B117, Chair: Sara Ahmed, Amir Yazdani

8:30AM *A Hardware-in-the-Loop Real Time Testbed for Microgrid Hierarchical Control [#18547]*
Hao Tu, Yuhua Du, Hui Yu, Srdjan Lukic, Mary Metelko, Peter Volgyesi, Abhishek Dubey and Gabor Karsai, North Carolina State University, United States; Vanderbilt University, United States

8:55AM *Decentralized Microgrid Synchronization Using a Reusable Information Architecture Platform [#18568]*
Yuhua Du, Hao Tu, Srdjan Lukic, Abhishek Dubey and Gabor Karsai, North Carolina State University, United States; Vanderbilt University, United States

9:20AM *Accurate Current Sharing and PCC Voltage Restoration in LVDC Microgrid without Communication Network [#18754]*
Khanh Hoang Duc and Hong-Hee Lee, University of Ulsan, Korea (South)

9:45AM *Implementation and Testing of a Real-time Microgrid Controller [#18760]*
Chu Sun, Fares Al Jajeh, Geza Joos and Bouffard Francois, McGill University, Canada

Studies and designs for UPS

Tuesday, September 25, 8:30AM-10:10AM, Room: B111, Chair: Alexis Kwasinski, John Hawkins

8:30AM *Integrated Single-Stage Bi-directional UPS with One-Cycle Mode Switching and Active Deadtime Control for Automotive Electronics [#18318]*
Dong Yan, Xugang Ke and D. Brian Ma, The University of Texas at Dallas, United States

8:55AM *Zero Common-Mode Voltage Three-Level Buck DC-DC Converter using 1.2 kV SiC MOSFET Neutral-Point-Clamped (NPC) Modules for UPS Applications [#19379]*
Paul Rankin, Sungjae Ohn, Jianghui Yu, Rolando Burgos, Dushan Boroyevich, Harish Suryanarayana and Christopher Belcastro, CPES, Virginia Tech, United States; ABB, United States

9:20AM *Three Terminal Common-Mode EMI Model and EMI Mitigation Strategy for Full SiC UPS [#19136]*
Sungjae Ohn, Jianghui Yu, Paul Rankin, Rolando Burgos, Dushan Boroyeivch, Harish Suryanarayana and Christopher Belcastro, CPES, Virgina Tech, United States; ABB, United States

9:45AM *Ultra-fast Utility Disconnect Switch for High Efficiency Medium Voltage UPS [#19190]*
Pietro Cairoli, Nick Elliott and Simon Walton, ABB Inc. USCRC, United States; ABB ltd., New Zealand

Batteries modelling and management 2

Tuesday, September 25, 8:30AM-10:10AM, Room: C120, Chair: Long Wu, Arash Nassiri Bavili

8:30AM *Analysis and Modeling of DHB Converter Applied in High-Voltage Battery Balancing [#18812]*
JieYi Sun, Chang She and Tao Cai, Huazhong University of Science and Technology, China

8:55AM *Enhancement of Li-ion Battery Performance at Low Temperatures by DC-DC Converter Duty-cycle Autotuning [#18834]*
Ala Hussein, Anirudh Pise, Xi Chen and Issa Batarseh, Yarmouk University, Jordan; University of Central Florida, United States

9:20AM *A Hierarchical ZVS Battery Equalizer Based on Bipolar CCM Buck-Boost Units [#18875]*
Faxiang Peng and Haoyu Wang, ShanghaiTech University, China

9:45AM *Lithium-ion Battery Rate-of-Degradation Modeling for Real-Time Battery Degradation Control during EV Drive Cycles [#18859]*
Ruxiu Zhao, Robert Lorenz and Thomas Jahns, University of Wisconsin-Madison, United States

Multi-level converters 2

Tuesday, September 25, 8:30AM-10:10AM, Room: B119, Chair: Francisco Daniel Freijedo, Yongsug Suh

8:30AM *Six-Leg AC-DC-AC Single-Phase Multilevel Converter for Grid Overvoltage Mitigation [#19734]*
Rodrigo P. de Lacerda, Edgard L. Fabricio and Cursino Jacobina, Federal University of Campina Grande, Brazil; Federal Institute of Paraiba, Brazil

8:55AM *A Control Scheme of Nine-Arm Modular Multilevel Converter [#18544]*
Futian Qin and Feng Gao, Shandong University, China

9:20AM *Cascaded Transformer Multilevel Inverters in Symmetrical Conditions Based on NPC [#18738]*
Filipe Bahia, Cursino Jacobina, Nady Rocha and Reuben Palmer, Federal University of Campina Grande (UFCG), Brazil; Federal University of the Paraiba (UFPB), Brazil

9:45AM *Battery Integrated Modular Multifunction Converter for Grid Energy Storage [#18989]*
Baljit Riar, Weilun Warren Chen and Regan Zane, Utah State University, United States

DC-DC non-isolated 2

Tuesday, September 25, 8:30AM-10:10AM, Room: C122, Chair: Dong Cao, Juan Rivas Davila

8:30AM *Optimized Parameter Design for a 20MHz Class E DC-DC Converter With ON-OFF Control [#18627]*
Ying Li, Li Zhang and Jiandong Dai, Nanjing Univ. of Aero. and Astro., China

8:55AM *Control of Bidirectional Interleaved DC-DC Converter with Single Current Sensor [#18027]*
Hung-Chi Chen, Che-Yu Lu and Chi-Hsiu Lu, National Chiao Tung University, Taiwan

9:20AM *Applying Switched-Capacitor Voltage Multiplier to Coupled Inductor Boost Converter for Getting Novel DC-DC Converter with High Voltage Gain and Low Voltage Stress [#18629]*
Manxin Chen, Kai Wai Cheng and Kerui Li, the Hong Kong Polytechnic University, Hong Kong; the University of Hong Kong, Hong Kong

9:45AM *High-Performance Megahertz-Frequency Resonant DC-DC Converter for Automotive LED Driver Applications [#19487]*
Mausamjeet Khatua, Ashish Kumar, Vahid Yousefzadeh, Alihossein Sepahvand, Montu Doshi, Dragan Maksimovic and Khurram Afridi, University of Colorado Boulder, United States; Texas Instruments, United States

Modeling and Control of Multilevel Converters 1

Tuesday, September 25, 8:30AM-10:10AM, Room: B116, Chair: Leon M Tolbert, Matthias Preindl

8:30AM *An Integrated Dual Voltage Loop Control for Capacitance Reduction in CHB-based Regenerative Motor Drive Systems [#18089]*
Zezhou Yang, Jianjun Sun, Yi Tang, Xiaoming Zha and Cheng Cheng, Wuhan University, China; Nanyang Technological University, Singapore

8:55AM *Universal Neutral Point Balancing Algorithm for Three-phase Three-level Converters with Hybrid of Zero-sequence Signal Injection and Virtual Zero-level Modulation [#18914]*
Jun Wang, Xibo Yuan, Kfir J. Dagan, Andrew Bloor, Phil Mellor and David Drury, University of Bristol, United Kingdom; Safran Electrical and Power UK, United Kingdom

9:20AM *A Novel ZVS Turn-on Triangular Current Mode Control with Phase Synchronization for Three Level Inverters [#19764]*
Nidhi Haryani, Sung Jae Ohn, Jiewen Hu, Paul Rankin, Rolando Burgos and Dushan Boroyevich, CPES, Virginia Tech, United States

9:45AM *SVM of Three-Level NPC Inverter with Unbalanced DC-Link [#18086]*
Ciro Attaianese, Giuseppe Tomasso, Mauro Di Monaco and Umberto Abronzini, University of Cassino and Southern Lazio, Italy

Stability in Power Converters 1

Tuesday, September 25, 8:30AM-10:10AM, Room: C121, Chair: Brendan McGrath, Joseph Olorunfemi Ojo

8:30AM *Small-Signal Modelling and Control Design of VSCs in Multi-terminal Railway Applications [#19093]*
Alberto Rodriguez-Cabero, Milan Prodanovic and Javier Roldan-Perez, IMDEA Energy Institute, Spain

8:55AM *Analysis of the Behavior of Synchronverters Operating in Parallel by Means of Component Connection Method (CCM) [#18587]*
Roberto Rosso, Marco Liserre and Soenke Engelken, WRD GmbH, Germany; University of Kiel, Germany

9:20AM *Influence of Reactive Power Flow on the DC-Link Voltage Control in Voltage- Source Converters [#19100]*
Dapeng Lu, Xiongfei Wang and Frede Blaabjerg, Aalborg University, Denmark

9:45AM *Refined Small-Signal Sequence Impedance Models of Type-III Wind Turbines [#19543]*
Ignacio Vieto, Jian Sun and Guanghui Li, Rensselaer Polytechnic Institute, United States; China Epri, China

Modeling and Control of DC-AC Converters 1

Tuesday, September 25, 8:30AM-10:10AM, Room: A108, Chair: Liliana De Lillo, Jiacheng Wang

8:30AM *A DSP Based Modeling and Digital Control of Single Phase Quasi-Z-Source Inverter [#18452]*
Xuliang Hou and Marcelo Godoy Simoes, Illinois Institute of Technology, United States; Colorado School of Mines, United States

8:55AM *Performance and Scalability Analysis of H2 Optimally Controlled Three-Phase Embedded Grids [#19618]*
David Dewar, Andrea Formentini, Pericle Zanchetta, Kang Li and Pat Wheeler, University of Nottingham, United Kingdom

9:20AM *Disturbance-Observer Assisted Controller for Stand-Alone Four-Leg Voltage Source Inverter [#18778]*
Marco di Benedetto, Mi Tang, Alessandro Lidozzi, Andrea Formentini, Luca Solero and Pericle Zanchetta, Roma Tre University, Italy; University of Nottingham, England

9:45AM *Closed-loop Elimination of Low-order Sideband Harmonics in Parallel-Connected Low-Pulse Ratio VSIs [#19155]*
Tao Xu, Feng Gao, Xiongfei Wang, Dongsheng Yang and Frede Blaabjerg, Shandong University, China; Aalborg University, Denmark

Machines for Transportation 1

Tuesday, September 25, 8:30AM-10:10AM, Room: B114, Chair: Ronghai Qu, Sara Roggia

8:30AM *Design of an Electric Machine for a 48-V Mild Hybrid Vehicle [#19732]*
Alireza Fatemi, Thomas Nehl, Lei Hao, Suresh Gopalakrishnan, Avoki Omekanda and Chandra Namuduri, General Motors, United States

8:55AM *Aligning the Reluctance and Magnet Torques in Permanent Magnet Synchronous Motors for Improved Performance [#18093]*
Maged Ibrahim and Pragasen Pillay, Concordia University, Canada

9:20AM *Scalability and Key Tradeoffs of Variable Flux PM Machines for Electric Vehicle Traction Motor Systems [#18767]*
Apoorva Athavale, David Diaz Regiosa, Kan Akatsu, Kazuto Sakai and Robert D. Lorenz, University of Wisconsin-Madison, WEMPEC, United States; University of Oviedo, Spain; Shibaura Inst. of Technology, Japan; Toyo University, Japan

9:45AM *Comparative Study of IPM Machines with Cylindrical and Salient Pole Shoe Rotors for Electric Vehicle Applications [#18864]*
Nan Zhao, Nigel Schofield and Yiheng Hu, McMaster University, Canada; University of Huddersfield, United Kingdom

High Speed and Bearingless Motors 2

Tuesday, September 25, 8:30AM-10:10AM, Room: B112, Chair: Wei Xu, Junichi Asama

8:30AM *Investigation of Efficiency Enhancement of an Ultra-high-speed Bearingless Motor at 100,000 r/min by High Switching Frequency Using SiC-MOSFET [#19010]*
Yu Fu, Masatsugu Takemoto, Satoshi Ogasawara and Koji Orikawa, Hokkaido University, Japan

8:55AM *Novel Bearingless Flux-Switching Motor with Exterior Rotor [#19608]*
Wolfgang Gruber, Radman Karlo and Goebl Elisabeth, Johannes Kepler University Linz, Austria; Linz Center of Mechatronics GmbH, Austria

9:20AM *Speed and Stability Limits for High-Speed Bearingless Disc Drives [#18010]*
Patricio Peralta, Douglas Marints Araujo and Yves Perriard, Laboratory of Integrated Actuators, EPFL, Switzerland

9:45AM *Design Optimization of Permanent Magnet Bearingless Motor Using Differential Evolution [#19778]*
Rafal Jastrzebski, Pekko Jaatinen, Akira Chiba and Olli Pyrhonen, Lappeenranta University of Technology, Finland; Tokyo Tech, Japan

Low Speed Machines

Tuesday, September 25, 8:30AM-10:10AM, Room: B118, Chair: Jonathan Bird, Siavash Pakdelian

8:30AM *Comparison of Modular Dual 3-phase PM Machines with Overlapping/Non-overlapping Windings [#18231]*
Yanxin Li, Zi-Qiang Zhu, Arwyn Sean Thomas, Zhanyuan Wu and Ximeng Wu, the University of Sheffield, United Kingdom; The University of Sheffield, United Kingdom; Siemens Gamesa Renewable Energy Limited, United Kingdom

8:55AM *Optimal Flux Modulation Pole Number in Vernier Permanent Magnet Synchronous Machines [#18007]*
Huayang Li, Z. Q. Zhu and Yue Liu, The University of Sheffield, United Kingdom

9:20AM *A Parameterized Linear Magnetic Equivalent Circuit for Air Core Radial Flux Coaxial Magnetic Gears with Halbach Arrays [#18441]*
Matthew Gardner, Derek Janak and Hamid Toliyat, Texas A and M University, United States

9:45AM *Conveyor System with a Highly Integrated Permanent Magnet Gear and Motor [#19049]*
Simon Staal Nielsen and Peter Omand Rasmussen, Aalborg University, Denmark

Sensorless Control of Electric Drives

Tuesday, September 25, 8:30AM-10:10AM, Room: B110, Chair: Fernando Briz, Liang Du

8:30AM *Discrete-time control of high-speed sensorless electrical drives [#19722]*
Federica Fugaro and Francesco Cupertino, Politecnico di Bari, Italy

8:55AM *Position and Capacitor Voltage Sensorless Control of High-Speed Surface-Mounted PMSM Drive with Output Filter [#19039]*
Yu Yao, Fei Peng and Yunkai Huang, Southeast University, China

9:20AM *Integral Sliding-Mode Method Based on Back-EMF for Restarting Speed Sensorless Controlled Induction Motor at Free Running Status [#18170]*
Lifeng Gou, Zisui Zhang, Chenchen Wang, Xiaojie You, Minglei Zhou and Jian Wang, Beijing Jiaotong University, China

9:45AM *EMF-based position sensorless drive with the instantaneous phase voltage measurement [#18789]*
Guan-Ren Chen, Shih-Chin Yang and Yu-Liang Hsu, National Taiwan University, Taiwan; Feng Chia University, Taiwan

High Speed Drives

Tuesday, September 25, 8:30AM-10:10AM, Room: B113, Chair: Alireza Fatemi, Thomas Wolbank

8:30AM *Open-Ended Induction Motor Drive with a Floating Capacitor Bridge and Overmodulation of the Primary Inverter [#18505]*
Albino Amerise, Michele Mengoni, Luca Zarri, Gabriele Rizzoli, Angelo Tani and Giovanni Serra, University of Bologna, Italy

8:55AM *Analysis of the Rotor Robustness of Ultra-high Speed Switched Reluctance Machines over 1 Million rpm Using Cohesive Zone Model [#19149]*
Cheng Gong, Sufei Li and Thomas Habetler, Georgia Institute of Technology, United States

9:20AM *Improving Torque Control Accuracy and Dynamics for High Power or High Speed Induction Machine Drives that Inherently Operate at Low Switching-to-Fundamental Frequency Ratios [#19134]*
Yukai Wang, Yang Xu and Robert Lorenz, University of Wisconsin-Madison, United States

9:45AM *Cascaded Converter for Electrolytic Capacitor-Less PMSM Drive System to Reduce Torque Ripple within Wide Speed Range [#18965]*
Li Quan, Kesong Zhu, Chao Zhang, Xiaoyong Zhu and Yuefei Zuo, Jiangsu University, China

Medium voltage components & systems

Tuesday, September 25, 8:30AM-10:10AM, Room: B115, Chair: Eddy Aeloiza, Fred Wang

8:30AM *A Survey on Recent Advances of Medium Voltage Silicon Carbide Power Devices [#19567]*
Boxue Hu, Lyu Xintong, Xing Diang, Ma Dihao, Brothers John, Na Risha and Wang Jin, The Ohio State University, United States

8:55AM *Three-Dimensional Electrical Field Analysis of a 6 kV H-bridge Power Electronics Building Block (PEBB) using 10 kV SiC MOSFET Devices [#18613]*
Yue Xu, Mona Ghessemi, Jun Wang, Rolando Burgos and Dushan Boroyevich, Center for Power Electronics Systems (CPES), United States

9:20AM *High-frequency Transformer Insulation in Medium-voltage SiC-enabled Solid-state Transformer [#19466]*
Qin Chen, Ravi Raju and Dong Dong, Applied Materials, United States; GE global research center, United States

9:45AM *High-Voltage High-Frequency Testing for Medium-Voltage Motor Insulation Degradation [#19649]*
Arshiah Mirza, Weiqiang Chen, Hiep Nguyen, Yang Cao and Ali Bazzi, UCONN, United States

Wireless Power Transfer 2

Tuesday, September 25, 8:30AM-10:10AM, Room: A105, Chair: Qiang Li, Chi-Kwan Lee

8:30AM *Performance Comparisons of 27.12 MHz Synchronous and Uncontrolled Rectifiers for Wireless Power Transfer Using Current-Mode Class D Topologies [#19522]*
Xin Zan and Al-Thaddeus Avestruz, University of Michigan, United States

8:55AM *Analytical Optimization of a Litz Wire Spiral Coil Based Underwater IPT System [#19510]*
Anindya Chitta Bagchi, Abhilash Kamineni and Regan Zane, Utah State University, United States

9:20AM *Simple Control Method of Wireless Power Transfer System Using Matrix Converter [#18845]*
Hiromasa Motoyama, Yuji Hayashi and Takaharu Takeshita, Nagoya Institute of Technology, Japan

9:45AM *High-Performance Capacitive Wireless Power Transfer System for Electric Vehicle Charging with Enhanced Coupling Plate Design [#19479]*
Brandon Regensburger, Jose Estrada, Ashish Kumar, Sreyam Sinha, Zoya Popovic and Khurram Afridi, University of Colorado Boulder, United States

Tuesday, September 25, 10:30AM-1:00PM

Plenary Poster Session: Energy Storage Systems

Tuesday, September 25, 10:30AM-1:00PM, Room: Exhibit Hall A and A1, Chair: Ke Ma, Rakesh Mitra

P3701 *A Revisit to Supercapacitor Capacitance Measurement Method 1A of IEC 62391-1 [#18114]*
Hengzhao Yang, California State University, Long Beach, United States

P3702 *A Dual-Source DHB-NPC Power Converter for Grid Connected Split Battery Energy Storage System [#18600]*
Umberto Abronzini, Ciro Attaianese, Alfonso Damiano, Mauro Di Monaco, Mario Porru, Alessandro Serpi and Giuseppe Tomasso, University of Cassino and Southern Lazio, Italy; University of Cagliari, Italy

P3703 *Inrush Current Estimation for Hot Swap of the Parallel Connected Large Capacity Battery Pack [#18763]*
Seongjun Lee and Jonghoon Kim, Chosun University, Korea, Republic of; Chungnam National University, Korea, Republic of

P3704 *Parameter Extraction of Ultracapacitor's Equivalent Circuit Model Using A Genetic Algorithm Approach [#19185]*
Xi Chen, Ala Hussein and Issa Batarseh, University of Central Florida, United States; Yarmouk University, Jordan

P3705 *SOC Estimation Method based on Modeling Strategy of Statistic Analysis and Improved EKF Algorithm [#19294]*
Dong Guo and Liangzong He, Xiamen University, China

P3706 *A PWM Based Adaptive Sliding Mode Dc-Dc buck Converter Control and a Voltage and Parameter Observer Scheme for Battery Charge Applications [#19314]*
Emeka Sunday, Adeola Balogun and Olorunfemi Ojo, University of Lagos, Nigeria; Tennessee Technological University, United States

P3707 *Net Zero Energy Houses with Constant PV Generation Supported by Electric Water Heater and Battery Energy Storage [#19498]*
Huangjie Gong, Vandana Rallabandi, Shaun Duerr, Cristinel Ababei and Dan Ionel, University of Kentucky, United States; Marquette University, United States

P3708 *Five-level gird-connected ANPC inverter with novel energy transfer strategy to be used for battery energy storage system [#19545]*
Hamid Reza Teymour G, Danny Sutanto, Kashem Muttaqi and Mohammad Rasouli, Jabil Circuit, United States; University of Wollongong, Australia; Penn State University, United States

P3709 *Improving the Capacity Factor and Stability of Multi-MW Grid Connected PV Systems with Results from a 1MW/2MWh Battery Demonstrator [#19572]*
Oluwaseun Akeyo, Vandana Rallabandi, Nicholas Jewell and Dan Ionel, University of Kentucky, United States; LGE and KU, Louisville, KY, United States

P3710 *Novel Single Stage AC-DC Battery Charger [#19750]*
Iman Askarianabyaneh, Majid Pahlevani and Andy Knight, University of Calgary, Canada

Plenary Poster Session: Solar PV Systems

Tuesday, September 25, 10:30AM-1:00PM, Room: Exhibit Hall A and A1, Chair: Wasi Uddin, Afshin Izadian

P3901 *A Control Scheme for Panel Level Maximum Power Extraction of Solar Panel Companion Inverters [#19704]*
Prasanth Sahu and Madhav Manjrekar, University of North Carolina at Charlotte, United States

P3902 *Implementation of BAT Algorithm as Maximum Power Point Tracking Technique for Photovoltaic System Under Partial Shading Conditions [#18255]*
Kok Soon Tey and Saad Mekhilef, University of Malaya, Malaysia

P3903 *Multi-time-horizon Solar Forecasting Using Recurrent Neural Network [#18623]*
Sakshi Mishra and Praveen Palanisamy, Planning Engineer at American Electric Power, United States; Perception Systems Engineer, General Motors RnD, United States

P3904 *Transistor-Clamped Multilevel H-Bridge Converter in Si and SiC Hybrid Configuration for High-Efficiency Low-Power Photovoltaic Applications [#18844]*
Yibin Zhang, Jiangbiao He, Sanjeevikumar Padmanaban and Dan Ionel, University of Kentucky, United States; GE Global Research, United States; University of Johannesburg, South Africa

P3905 *Measuring Method for Solar Irradiance at Multi-Points with Different Color Based on Image Analysis [#18940]*
Kento Kawakami, Akiko Takahashi, Jun Imai and Shigeyuki Funabiki, Okayama university, Japan

P3906 *A Comprehensive Comparison of Non-Isolated and Isolated Single-Phase Grid-Tied Photovoltaic Microinverters [#19130]*
Khalil Alluhaybi and Issa Batarseh, University of Central Florida, United States

P3907 *Improvement of ventilation drive system with solar power and hybrid control structure [#19182]*
Simon Staal Nielsen, Tamas Kerekes, Dezso Sera and Peter Omand Rasmussen, Aalborg University, Denmark

P3908 *A Resonant Multilevel Modular Boost Inverter for Single-Phase Photovoltaic Systems [#19452]*
Ze Ni, Yanchao Li, Xiaofeng Lyu, Jalen Johnson and Dong Cao, North Dakota State University, United States

P3909 *Performance and Output Balancing Strategy of Three-Phase AC-Stacked PV Inverter Architecture Integrated with Battery under Asymmetrical Irradiance Changes [#19552]*
Namwon Kim, Mehrdad Biglarbegian and Babak Parkhideh, University of North Carolina at Charlotte, United States

Plenary Poster Session: Converters for Power Systems

Tuesday, September 25, 10:30AM-1:00PM, Room: Exhibit Hall A and A1, Chair: Alessandro Lidozzi, Paolo Mattavelli

P4101 *Doubly Fed Induction Generator with Cascade Converter for Improving Dynamic Performances [#18120]*
Zakiud Din, Jiangzhong Zhang, Jin Zhao and Yongjiang Jiang, Southeast University, China

P4102 *Improving the Stability of Electrolytic Capacitorless Single Phase Two Stage AC/DC Rectifier by Shaping the Input Impedance of Second Harmonic Current Compensator [#18453]*
Xinze Huang, Xinbo Ruan, Haoling Wu and Jie Fang, Nanjing University of Aeronautics and Astron., China

P4103 *A Unified Power Flow Controller With Nine-Arm Modular Multilevel Converter [#18545]*
Futian Qin and Feng Gao, Shandong University, China

P4104 *Series Active Compensator Based on Single-Phase Current-Source Converters with Minimum DC Link Current Operation [#18611]*
Pedro Melin, Jaime Rothen, Munoz Javier, Baier Carlos and Hermandez Franco, Universidad del Bio-Bio, Chile; Universidad de Talca, Chile

P4105 *Active-Switched-Capacitor Based Diode Assisted and Capacitor Assisted Extended Switched Boost Z- Source Inverters [#18898]*
Anish Ahmad and Rajeev Kumar Singh, Indian Institute of Technology (B.H.U.), Varanas, India

P4106 *Universal Active Power Filter Based on Three Three-Leg Converters and a Single DC-Link [#19296]*
Phelipe Leal Serafim Rodrigues and Cursino Brandao Jacobina, Federal University of Campina Grande, Brazil

P4107 *A Single Source Cascaded Multilevel Inverter Based on Switched-capacitor with Series and Parallel Connectivity [#18904]*
Yat Chi Fong, Ka Wai Eric Cheng and Jiefeng Hu, Dept of EE, The Hong Kong Polytechnic University, Hong Kong

P4108 *PLL-less Current Vector Control of VSC-HVDC for Ultra Weak Grid Interconnection [#19047]*
Dongsheng Yang, Xiongfei Wang and Blaabjerg Frede, Aalborg University, Denmark

P4109 *Analysis and Suppressing Method of Magnetizing Bias on High Frequency Transformer in Electrical Energy Router [#18334]*
Jianning Sun, Liqiang Yuan, Kai Li, Qing Gu and Zhengming Zhao, Tsinghua University, China

P4110 *Submodule Test Circuit for MMC-based Voltage Sourced HVDC System [#18726]*
Byung-Jun Seo, Gwon-Sik Park and Eui-Cheol Nho, Pukyong National University, Korea (South)

Plenary Poster Session: Grid Operation and Stability

Tuesday, September 25, 10:30AM-1:00PM, Room: Exhibit Hall A and A1, Chair: Alessandro Costabeber, Xiongfei Wang

P4301 *CLLC-type DC Transformer in Hybrid AC/DC Microgrid with Maximum Power Transmission Ability and Robust Voltage Conversion Gain [#18121]*
Jingjing Huang and Xin Zhang, Nanyang Technological University, Singapore

P4302 *Integrated Multi-horizon Power and Energy Forecast for Aggregated Electric Water Heaters [#18229]*
Xun Gong, Julian Luciano Cardenas Barrera, Liuchen Chang, Eduardo Castillo Guerra, Bo Cao and Saleh Saleh, University of New Brunswick, Canada

P4303 *Single Domestic Electric Water Heater Control with State Forecast [#18233]*
Sheng Xiang, Liuchen Chang, Julian L Cardenas Barrera, Yigang He and Kehan Wu, Hefei University of Technology, China; University of New Brunswick, Canada; Hefei University of Technology, Canada; Anhui Provincial Electric Power Company Training, China

P4304 *Frequency-division Impedance Shaping Control Method for Grid-connected Inverters in a Weak Grid [#18281]*
KunLong Zhu, Pengju Sun, Luowei Zhou, Xiong Du, Biao Li and Jie Wang, Chongqing University, China

P4305 *Design and Performance Evaluation of the Modular Multilevel Converter (MMC)-based Grid-tied PV-Battery Conversion System [#18329]*
Lei Zhang, Zhengda Zhang, Jiangchao Qin, Yuntao Zou, Di Shi and Zhiwei Wang, Arizona State University, United States; GEIRI North America, United States

P4306 *Modeling and Stability Analysis of Three-Phase Paralleled Grid-Connected Inverters with LCL Filter [#18380]*
Jin Xia, Bo Que, Guangdi Li, Chao Chen and Yan Deng, Zhejiang University, China; State Grid Zhejiang Electric Power Company, LTD., China

P4307 *Reducing Generation Cost by Optimum Load Scheduling in Smart Grid Considering System Loss [#18523]*
Shuvangkar Chandra Das, Partha Protim Saha, Md. Forkan Uddin and Hossain Eklas, BUET, Bangladesh, Bangladesh; Oregon Tech, USA, United States

P4308 *Grid Synchronization of Wind Turbines during Severe Symmetrical Faults with Phase Jumps [#18777]*
Mads Kjeldal Graungaard, Xiongfei Wang, Pooya Davari and Frede Blaabjerg, Energy Technology at Aalborg University, Denmark

P4309 *Electric Hot Water Heater Primary Frequency Control [#18802]*
Ali Shahbaz Haider, William Daigle Stark and Ted K.A. Brekken, Oregon State University, Corvallis, United States

P4310 *A Novel PQ Control Strategy for Non-Phase-Locked Loop based on Hilbert Transform [#18896]*
Hongbin Pan, Tianyang Wei, Cheng Deng and Haihong Long, Xiangtan University, China

P4311 *Reducing HVDC Network Oscillations Considering Wind Intermittency in View of Grid Expansion Decision [#19088]*
Atousa Elahidoost, Elisabetta Tedeschi, Luca Furieri and Maryam Kamgarpour, Norwegian University of Science and Technology, Norway; Swiss Federal Institute of Technology (ETH), Switzerland

P4312 *A novel Phase-lock Loop with Feed-back Repetitive Controller for robustness to periodic disturbance in three-phase systems [#19621]*
Mi Tang, Stefano Bifaretti, Shafiq Odhano, Pericle Zanchetta and Sabino Pipolo, the University of Nottingham, United Kingdom; University of Rome "Tor Vergata", Italy

P4313 *A General Approach to Select Location and Ratings of Energy Storage Systems in Local Area Energy Networks [#18945]*
Paolo Tenti and Tommaso Caldognetto, University of Padova, Italy

Plenary Poster Session: Batteries Management & Infrastractures

Tuesday, September 25, 10:30AM-1:00PM, Room: Exhibit Hall A and A1, Chair: Stephan Rees, Vikram Immanuel

P4501 *Online identification of internal impedance of Li-ion battery using ternary-sequence injection [#18122]*
Jussi Sihvo, Tomi Roinila and Tuomas Messo, Tampere University of Technology, Finland

P4502 *Design and Implementation of Bidirectional DC-DC CLLLC Resonant Converter [#18357]*
Chang Hao-Tang and Liang Tsorng-Juu, National Cheng Kung University, Taiwan, Taiwan

P4503 *SOH Estimation of LMO/NMC-based Electric Vehicle Lithium-Ion Batteries using the Incremental Capacity Analysis Technique [#18500]*
Daniel Stroe and Erik Schaltz, Aalborg University, Denmark

P4504 *An Interleaved Phase-Shift Control of Single Input Multi Output Cell Balancing Circuit using Dual Active Bridge [#19518]*
Ramesh P. and Amit Patra, INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR, India

P4505 *Thermal monitoring of LiFePO4 batteries using switching harmonics [#19222]*
Cristina Gonzalez, Daniel Fernandez, Juan Manuel Guerrero, David Diaz and Fernando Briz, Universty of Oviedo, Spain; University of Oviedo, Spain

P4506 *A Neural Network Energy Management Controller Applied to a Hybrid Energy Storage System using the Multi-Source Inverter [#19350]*
John Ramoul, Ephrem Chemali, Lea Dorn-Gomba and Ali Emadi, McMaster University, Canada

P4507 *Application Layer Design for Smart Battery Pack Control with Wi-Fi Feedback [#19642]*
Jan-Ludwig Lafrenz, Phillip Scheff, Mattia Ricco, Kerekes Tamas, Rasmus Loevenstein Olsen, Teodorescu Remus and Marco Liserre, Aalborg University, Denmark; University of Kiel, Germany

P4508 *Impact of Low-Frequency Current Ripple on Lifetime of Battery in MMC-based Battery Storage System [#19187]*
Ishaan Puranik, Lei Zhang and Jiangchao Qin, Arizona State University, United States

P4509 *A Novel Active Equalization Topology for Series-Connected Lithium-ion Battery Packs [#19417]*
Xiaofeng Ding and Donghuai Zhang, Beihang University, China

P4510 *Fast and Precise Detection of Internal Short Circuit on Li-Ion Battery [#19599]*
Amirhossein Moeini and Shuo Wang, University of Florida, United States

P4511 *Active Levitation and Propulsion System: Design, Analysis, Control and Prototyping [#18201]*
Jawwad Sayeed, Ahmed Abdelrahman and Mohamed Youssef, UOIT, Canada

P4512 *Modeling Harmonic Impacts of Electric Vehicle Chargers on Distribution Networks [#18782]*
Nicole Woodman, Mike Donnelly and Robert Bass, Intel Corporation, United States; Mentor, A Siemens Business, United States; Portland State University, United States

P4513 *Cost Optimization of an Opportunity Charging Transportation Bus Network [#19708]*
Mehmet Gormez, Ali Topcu and Yilmaz Sozer, University of Akron, United States

P4514 *Control of Delta-Connected Cascaded Converter in the Railway Power Conditioner Application [#19382]*
Ping-heng Wu and Tai-Cheng Po, National Tsing Hua University, Taiwan

P4515 *Design of a Medium Voltage DC Fast Charging Station with Grid Voltage Regulation and Central Modular Multilevel Converter [#18950]*
Luis Camurca, Costa Ferreira, Xiang Gao and Marco Liserre, Universitat zu Kiel, Germany

P4516 *A High Voltage Gain Quasi-Switched Boost Impedance Network for Renewable Energy Applications [#19558]*
Amit Kumar, Queen's University, Canada

Plenary Poster Session: DC-DC Converters Poster 2

Tuesday, September 25, 10:30AM-1:00PM, Room: Exhibit Hall A and A1, Chair: Martin Ordonez, Daniel Costinett

P4701 *Comparison of GaN and Si based Dual Active Bridge Converters for Energy Storage Systems [#19737]*
Hassan Hassan and Mark Scott, Miami University, United States

P4702 *A Single-Switch Self-Driving High Frequency Converter Based on Optimal Feedback Network [#18307]*
Yueshi Guan, Xihong Hu, Yijie Wang, Dianguo Xu and Wei Wang, Harbin Institute of Technology, China

P4703 *An Experimental Investigation and Comparison of Bi-directional Energy Harvesters for intelligent Green Energy Management System(iGEMS) [#18395]*
Ramesh Palanisami, Aby Joseph, Arya G Lal and Aji Us, Centre for Development of Advanced Computing, India

P4704 *A Peak Voltage Suppression Method under ON/OFF Control in dc-dc Converter with Class Phi-2 Inverter [#18709]*
Yuta Yanagisawa, Yushi Miura, Hiroyuki Handa, Tetsuzo Ueda and Toshifumi Ise, Osaka University, Japan; Panasonic Corporation, Japan

P4705 *Adaptive Control Technique for High Power Efficiency Dual Active Bridge DC-DC Converter with Wide Load Range [#18308]*
Takaaki Soejima, Yoichi Ishizuka, Toshiro Hirose and Kazuhide Domoto, Nagasaki University, Japan; Nishimu Electronics Industries Company, Japan

P4706 *Operation-Oriented Design Procedure of a Three-Phase Dual-Actrive Bridge Converter for a Wide Operation Range [#18761]*
Zhiqing Yang, Jingxin Hu, Rik W. De Doncker and Goutham Chakravarthi Pasupuleti, PGS, E.ON Energy Research Center, RWTH Aachen, Germany

P4707 *Optimal Winding Layer Allocation for Minimizing Copper Loss of Secondary-Side Center-Tapped Forward Transformer with Parallel-Connected Secondary Windings [#18923]*
Shirakawa Tomohide, Umetani Kazuhiro, Hiraki Eiji, Hyodo Takashi, Yokoi Toshiyuki and Ito Yuki, Okayama University, Japan; Omron corporation, Japan

P4708 *A Novel ZCS Full-Bridge PWM Converter with Simple Auxiliary Circuits [#18557]*
Dajun Ma, Wu Chen, Liangcai Shu and Guangfu Ning, Southeast University, China

P4709 *Non-Isolated Soft-Switching Coupled-Inductor-Based High Step-Down DC-DC Converter [#19427]*
Jixiao Nai and Liangzong He, Xiamen University, China

P4710 *New No-isolated Interleaved Bidirectional soft-switching DC-DC Converter with a Novel Auxiliary ZVT Cell [#18286]*
Lejia Sun, Fang Zhuo, Feng Wang and Hao Yi, Xi'an Jiaotong University, China

Plenary Poster Session: AC-DC single-phase Poster 1

Tuesday, September 25, 10:30AM-1:00PM, Room: Exhibit Hall A and A1, Chair: Francisco Canales, Luis Arnedo

P4901 *A Bridgeless Three-Level Integrated AC-DC Resonant Converter with Self-Balanced Bus Capacitor Voltage [#19494]*
Cong Wang, Shangzhi Pan and Praveen Jain, Queen's University, Canada

P4902 *A High Power Density Power Factor Correction Converter With a Multilevel Boost Front-End and a Series-Stacked Energy Decoupling Buffer [#19412]*
Zitao Liao, Nathan Brooks and Robert Pilawa, University of Illinois, Urbana, United States; University of California, Berkeley, United States

P4903 *A Series-Pass Modules for Shaping Input Current of Flyback PFC [#18356]*
Tung Chung-Pui, Wang Ke-Wei, Ho Ka-Wai, Chow Jeff Po-Wa, Fan John Wing-To, Chan Wan-Tim and Chung Henry Shu-Hung, City University of Hong Kong, Hong Kong; Mosway Semiconductor Limited, Hong Kong

P4904 *Analysis and Design of a Single-Stage ZVS AC-DC Stacked Flyback Converter [#18606]*
Yuntong Li and Gerry Moschopoulos, University of Western Ontario, Canada

P4905 *A Single Phase Hybrid Interleaved Parallel Boost PFC Converter [#18608]*
Jianyu Hu, Wenxun Xiao, Dongyuan Qiu, Bo Zhang and Carl Ngai Man Ho, South China University of Technology, China; University of Manitoba, Canada

P4906 *Control Optimization of Single-Stage Bidirectional Dual-Active-Bridge AC-DC Converter Based on Enhancement Mode GaN Power Transistor [#19175]*
Tianxiang Chen, Ruiyang Yu and Alex Q. Huang, The University of Texas at Austin, United States

P4907 *Symmetric Multicell Single-Phase Rectifiers with Shared Diode Legs and Cascaded Transformers [#19401]*
Joao Paulo Mello and Cursino Jacobina, Federal University of Campina Grande, Brazil

P4908 *Power Losses Estimation on a Semi-Bridgeless PFC Using Response Surface Methodology [#19586]*
Maria Celeste Garcia Perez, Mohammad Mahdavi, Matthieu Amyotte, Ettore Sacbeni Glitz and Martin Ordonez, University of British Columbia, Canada

P4909 *Resonant Control based Frequency Domain Compensation for Single-Phase PFC [#18011]*
Zhi Geng, Unique Technical Service, LLC, United States

P4910 *Single-Phase AC-DC Buck PFC Converter Based on Flying-Capacitor Topology with Active Power Decoupling Control [#18183]*
Kaicheng Ding, Yan Zhang, Jinjun Liu, Pengxiang Zeng and Yanfei Huang, Xi'an Jiaotong University, China

Plenary Poster Session: Multi-phase Converters Poster 1

Tuesday, September 25, 10:30AM-1:00PM, Room: Exhibit Hall A and A1, Chair: Petar Grbovic, Roberto Petrella

P5101 *SiC MOSFETs Based Bi-Directional 3-Phase AC/DC Converter [#18521]*
Jianwen Shao, Barkley Adam, Hu Yuequan, Ong Teik and Agrawal Binod, Wolfspeed, United States; Wolfspeed, India

P5102 *Power Factor Operation of a Boost Integrated Three-Phase Solar Inverter using Current Unfolding and Active Damping Methods [#19740]*
Ha Pham, Tomoyuki Mannen and Wada Keiji, University of Technology, Sydney, Australia; Tokyo Metropolitan University, Japan

P5103 *Highly Efficient Integrated Low-Voltage Multi-Phase Inverter for ISCAD Application [#18047]*
Benjamin Rubey, Adrian Patzak, Florian Bachheibl and Dieter Gerling, volabo GmbH, Germany; Universitaet der Bundeswehr Muenchen, Germany

P5104 *A Modular Two-Stage DC-Three Phase Converter [#19394]*
Giri Venkataramanan and Maithreyee Marathe, University of Wisconsin-Madison, United States; National Institute of Technology-Suratkal, India

P5105 *An Efficient Snubber Circuit for Soft-Switched Capacitive-Link Universal Converters [#18682]*
Masih Khodabandeh and Mahshid Amirabadi, Northeastern University, United States

P5106 *Analysis and Design of Four-Switch Three-Phase AC-DC Converter with Galvanic Isolation [#18612]*
Javad Khodabakhsh and Gerry Moschopoulos, Western University, Canada

P5107 *High-Gain Modular Three-Phase Hybrid Boost Rectifier for Small Wind Energy Harvesting System [#18451]*
Julio Cesar Dias and Telles Brunelli Lazzarin, Federal University of Santa Catarina, Brazil

Plenary Poster Session: Multi-level converters Poster 8

Tuesday, September 25, 10:30AM-1:00PM, Room: Exhibit Hall A and A1, Chair: Bob Guenther, Subhashish Bhattacharya

P5301 *Impact of Modulation Methods on the Trade-Off between Investment and Operation Costs of a Medium-Voltage MMC-based STATCOM [#19159]*
Frederik Hahn, Remus Teodorescu, Giampaolo Buticchi, Marco Liserre and Cristian Lascu, Christian-Albrechts-University of Kiel, Germany; Aalborg University, Denmark; The University of Nottingham Ningbo China, China

P5302 *A Unidirectional Flying-Chainlink Modular Multilevel Rectifier (FCL-MMR) with Reduced Energy Storage for Offshore Wind Integration [#19391]*
Alessandro Costabeber, Francesco Tardelli, Marija Jankovic, Jon Clare and Pericle Zanchetta, University of Nottingham, United Kingdom

P5303 *Accurate circulating current estimation of modular multilevel converters with coupled inductors [#18758]*
Wang Shaozhe, Shen Ke and Zhao Dan, Northwestern Polytechnical University, China

P5304 *Improved Modulation Strategy for Semi-Full-Bridge Submodule in Modular Multilevel Converter [#19276]*
Rong Xu, Xiangjun Quan, Yang Lei, Soumik Sen and Alex Q Huang, SPEC,The University of Texas at Austin, United S, United States; Electrical engineering department, Southeast Uni, China

P5305 *A Bi-Directional Non-Isolated Multi Level DC-DC Converter for Wide Voltage Gain [#19403]*
Saikat Ghosh, Prabhat Tripathi, Kumaran Nathan and Teng Long, University of Cambridge, United Kingdom

P5306 *Experimental Validation of a Quasi Two-Level PWM-Operated Modular Multilevel Converter [#18106]*
Jakub Kucka and Axel Mertens, Leibniz Universitaet Hannover, Germany

P5307 *Assessment of Modular Multilevel Converter with Partly Integrated Battery Energy Storage System [#18736]*
Zuyao Ze, Hua Lin, Yajun Ma and Zhe Wang, Huazhong University of Science and Technology, China

P5308 *An Analysis and Investigation on the Fundamental Frequency of Chain-link Modular Multilevel DC-DC Converter for Low Step-Ratio High-Power MVDC Applications [#19008]*
Xin Xiang, Xiaotian Zhang, Yunjie Gu, Geraint Chaffey and Tim Green, Imperial College London, United Kingdom

P5309 *Modular-Concatenated-Cell (MCC) Multilevel Converter: Novel Circuit Topology And Innovative Logic-Equations-Based Modulation Technique For Natural Balance Control Of Flying-Capacitor Voltages [#19396]*
Vahid Dargahi, Keith Corzine, Johan Enslin, Jose Rodriguez and Frede Blaabjerg, Clemson University, United States; University of California, Santa Cruz, United States; Universidad Andres Bello, Chile; Aalborg University, Denmark

P5310 *A Novel Least Component Count Single DC-link Fed Generalized Multilevel Inverter Configuration for Three-phase High Power Isolated Grid Connected Systems [#18073]*
Satish Naik Banavath, Ravi Prakash Reddy Siddavatam, Umanand Loganathan, Subba Reddy Basappa and Gopakumar Kumarkutti, Indian Institute of Science, India

Plenary Poster Session: Modeling and Control of Multilevel Converters

Tuesday, September 25, 10:30AM-1:00PM, Room: Exhibit Hall A and A1, Chair: Feng Gao, Gregory Kish

P5501 *Analysis and Design of a Quasi-Proportional-Resonant Based Voltage Balancing Control for Grid-Connected Nested Neutral Point Clamped Converter [#18708]*
Akinola Ayodeji Ajayi-Obe and Mohamed Azeem Khan, University of Cape Town, South Africa

P5502 *A Deep Neural Network Based Predictive Control Strategy for High Frequency Multilevel Converters [#18711]*
Daming Wang, Sai Tang, Chao Zhang, Jun Wang, Zhikang Shuai, Xin Yin and Z. John Shen, Hunan University, China

P5503 *PWM Strategy for 3Phase Active Front End Cascaded 5 Level NPC H-Bridge [#18691]*
Hyun-Sam Jung, Hwigon Kim and Seung-Ki Sul, Seoul National University, Korea (South)

P5504 *A Partial Energy Input Based Three-Port Cascade Multi-level Hexverter and Its Loop Current Control [#19318]*
Fei Liu, Haiyou Gao, Wenjun Liu, Pan Wang, Xiaoming Zha and Yi Tang, Wuhan university, China; Nanyang Technological University, Singapore

P5505 *Generalized Innovative Logic-Equation-Based Modulation Method For Control Of An Improved Active-Neutral-Point-Clamped (I-ANPC) Multilevel Converter [#19447]*
Vahid Dargahi, Keith Corzine, Johan Enslin, Jose Rodriguez and Frede Blaabjerg, Clemson University, United States; University of California, Santa Cruz, United States; Universidad Andres Bello, Chile; Aalborg University, Denmark

P5506 *Modulation Methods for 3L-NPC Converter Power Loss Management in STATCOM Application [#19554]*
Jiuyang Zhou and Po-tai Cheng, National Tsing Hua University, Taiwan

P5507 *A Tuned DPWM to Balance the Neutral-Point Voltage of MVPWM-Controlled Three-Level T-Type Inverter [#18636]*
Tzung-Lin Lee and Yue-Ting Tsai, National Sun Yat-sen University, Taiwan

P5508 *Zero-Sequence Circulating Current Analysis and Reduction in Paralleled Three-Level Active Neutral Point Clamped Inverters [#19281]*
Ruirui Chen, Jiahao Niu, Zheyu Zhang, Handong Gui, Ren Ren, Fred Wang, Leon Tolbert, Daniel Costinett, Benjamin Blalock, Benjamin Choi and Gerald Brown, University of Tennessee, United States; NASA Glenn Research Center, United States

P5509 *DC Link Voltage Balancing Technique Utilizing Space Vector Control in SiC-based Five-Level Back-to-Back-Connected NPC Converters [#19249]*
Georgios Mademlis and Yujing Liu, Chalmers University of Technology, Sweden

P5510 *Control Strategy and Simulation of a Modular Multilevel Converter (MMC) based Pump-Back System for Variable Speed Drive Application [#18429]*
Yunpeng Si and Qin Lei, Arizona State University, United States

P5511 *Frequency Domain Control algorithm for Modular Multilevel Converters Under Grid Fault Conditions [#18559]*
Rostan Rodrigues and Herb Ginn, ABB Inc, United States; University of South Carolina, United States

P5512 *Operation Boundary Analysis and Capacitor Voltage Ripple Suppression Control Strategy of MMC Considering the Impact of Circulating-Current Control [#19355]*
Xiaoqian Li, Jingwei Meng, Qiang Song, Wenhua Liu, Shukai Xu, Zhe Zhu and Xiaolin Li, Tsinghua University, China; EPRI of China South Power Grid, China

P5513 *Novel Control Approach for Modular Multilevel Converter Based on AlphaBeta0 Reference Frame Without PLL [#18508]*
Yuntao Zou, Jiangchao Qin, Lei Zhang and Zhengda Zhang, Arizona State University, United States

P5514 *Quasi Square Wave Modulation With Voltage Transformation Ability Applied to Modular Multilevel DC-DC Converter [#18858]*
Yanlin Zhu, Feng Wang, Shuhuai Shi, Sheng Cheng, Fang Zhuo and Xiaotong Du, Xi'an Jiaotong University, China

Plenary Poster Session: Modeling and Control of Grid Connected Converter

Tuesday, September 25, 10:30AM-1:00PM, Room: Exhibit Hall A and A1, Chair: Kai Sun, Keiji Wada

P5701 *Weak Grid Impacts on the Design of Grid-tied Voltage Source Inverters [#19164]*
Aswad Adib and Shadmand Mohammad, Kansas State University, United States

P5702 *Dead-Beat Current Controller for Voltage Source Inverter with LCL Grid-Tied Filter [#19116]*
Haider Mohomad, University of New Brunswick, Canada

P5703 *Discrete Diagonal State Estimator based Current Control for Grid Connected PWM Converter with an LCL filter [#19423]*
Byeongheon Kim, Heonyoung Kim and Subhashish Bhattacharya, North Carolina State University, United States

P5704 *Generalized resonant controllers for the current control of grid-connected voltage source converters [#18944]*
Sizhan Zhou, Jinjun Liu and Yan Zhang, Xi'an Jiaotong University, China

P5705 *A Novel Pre-charge Circuit using Virtual Miller Capacitor in Grid Connected Converters [#18454]*
Lei Wang, Mehran Mirjafari and Padmanabh Gharpure, Dell EMC, United States

P5706 *A Control Method for Improving Efficiency of Modular Solid-state Transformer based Converter System [#19424]*
Dong Dong, Ravi Raju, Govardhan Ganireddy and Mohammed Agamy, GE global research center, United States; GE renewable energy, United States

P5707 *Evaluation of Advanced PLL Concepts for Enhanced Fault Ride Through Response [#19113]*
Hendrik Just, Huoming Yang and Sibylle Dieckerhoff, Technische Universitaet Berlin, Germany; Shanghai Jiao Tong University, China

P5708 *Comparison of Discretization Methods on the Secord Order Generalized Integrator Frequency-Locked Loop [#18223]*
Yang Caiwei, Wang Jian, You Xiaojie, Wang Chenchen and Zhou Minglei, Beijing Jiaotong University, China

P5709 *Modeling and stability analysis of the phase-locked loop for single phase grid-tied inverter [#19079]*
Qiang Qian, Jinming Xu, Shengyiyang Bian, Ni Zhaohui and Shaojun Xie, Nanjing University of Aero. and Astronautics, China

P5710 *Phase-Locked Loop Small-Signal Disturbance Compensation Control for Three-Phase LCL-Type Grid-Connected Converter under Weak Grid [#18291]*
Donghai Zhu, Shiying Zhou, Xudong Zou and Yong Kang, Huazhong University of Science and Technology, China

P5711 *A Three-Port Three-Phase DC-AC Topology Based Multi-Functional Grid-Connected Inverter with Enhanced Conversion Efficiency [#18294]*
Tianyu Yang, Jiangfeng Wang, Yan Xing and Hongfei Wu, Nanjing University of AeronauticsandAstronautics, China

P5712 *Fuzzy Gain Scheduling based Grid Synchronization System Responsive to the Electrical Network Conditions [#19634]*
Rouzbehi Kumars, Luna Alvaro, Catalan Pedro, Rocabert Joan and Rodriguez Pedro, Universidad Loyola Andalucia, Spain; Universitat Politecnica de Catalunya, Spain; Ingeteam, Spain

P5713 *Fast Dynamic Control of Stacked Low Inertia Converters [#19662]*
Liran Zheng, Karthik Kandasamy, Rajendra Kandula and Deepak Divan, Georgia Institute of Technology, United States

P5714 *Multiple PR Current Regulator based Dead-time Effects Compensation for Grid-forming Single-Phase Inverter [#19521]*
Siyuan Chen, Zibo Chen and Wensong Yu, NC State University, United States

P5715 *Realizable-reference anti-windup implementation for parallel controllers in multiple reference frames [#19606]*
Juan Manuel Guerrero, Cristina Gonzalez-Moral, Daniel Fernandez, David Diaz-Reigosa, Carlos Rivas and Fernando Briz, Universidad de Oviedo, Spain; Elinsa, Spain

P5716 *Enhancing the Harmonic Current Sharing Performance of Low-switching-frequency Inverters through Dynamic Impedance Shaping [#18250]*
Yang Qi and Yi Tang, Nanyang Technological University, Singapore

Plenary Poster Session: Power Quality

Tuesday, September 25, 10:30AM-1:00PM, Room: Exhibit Hall A and A1, Chair: Qin Lei, Lixiang Wei

P5901 *Robust Current Control Method for LCL-Type Shunt Active Power Filters with Inverter-Side Current Feedback Active Damping [#18908]*
Lei Yang and Jia-qiang Yang, Zhejiang University, China

P5902 *Voltage Sag Compensation Under Distorted Grid Voltage Condition [#19210]*
Joao Martins, Darlan Fernandes, Mauricio Correa, Fabiano Costa, Montie Vitorino and Edison Silva, Federal University of Campina Grande, Brazil; Federal University of Paraiba, Brazil; Federal University of Bahia, Brazil

P5903 *Analysis and Comparison of Two Harmonics Control Alternatives for the Jacking System VFD of a Liftboat: Pseudo 24 Pulse Configuration and Active Power Filters [#18352]*
Fabian Pineda Monsalve, Zentech Incorporated, United States

P5904 *Four-leg Inverter with Reduced Order Generalized Controller for Unbalanced Load Detection and Compensation [#18605]*
Shilei Jiao, Sumit Kumar Pramanick and Kaushik Rajashekara, University of Houston, United States

P5905 *Harmonics Suppression and Control Design for General-Purpose Mission Profile Emulator of Three-phase Power Electronics System [#18700]*
Yubo Song, Ran Cheng and Ke Ma, Shanghai Jiao Tong University, China

P5906 *Single-Phase Six-Switch Universal Active Power Filter [#19290]*
Phelipe Leal Serafim Rodrigues and Cursino Brandao Jacobina, Federal University of Campina Grande, Brazil

P5907 *Three-Phase Four-Wire AC-DC-AC Multilevel System Without Series Transformer [#19657]*
Antonio de Paula Dias Queiroz, Cursino Brandao Jacobina and Ayslan Caisson Noroes Maia, Federal Institute of Paraiba, Brazil; Federal University of Campina Grande, Brazil; Federal Institute of Alagoas, Brazil

Plenary Poster Session: Motor Noise, Vibration, Reliability, Diagnostics and Protection

Tuesday, September 25, 10:30AM-1:00PM, Room: Exhibit Hall A and A1, Chair: Tom Cox, Silvio Vaschetto

P6101 *State Space-Vector Model of Linear Induction Motors Including Iron Losses Part I: Theoretical Analysis [#18514]*
Angelo Accetta, Marcello Pucci and Antonino Sferlazza, ISSIA-CNR, Italy; University of Palermo, Italy

P6102 *State Space-Vector Model of Linear Induction Motors Including Iron Losses: Part II: Model Identification and Results [#18515]*
Angelo Acetta, Marcello Pucci and Antonino Sferlazza, ISSIA-CNR, Italy; University of Palermo, Italy

P6103 *Design Optimization and Analysis of Linear Hybrid-Excited Slot Permanent Magnet Machines [#18974]*
Yiming Shen, Zhejiang University, China

P6104 *Utilizing Winding Leakage as Integrated Boost-Inductance for a Line-frequency Zig-Zag Transformer employed in a Unified AC-DC System [#19082]*
Annoy Kumar Das, Akshatha Shetty and Baylon G. Fernandes, Indian Institute of Technology, Bombay, India, India

P6105 *Development of a dynamic electromagnetic model for solenoid-based fuel injectors [#18175]*
Shifang Li, Thomas Nehl, Suresh Gopalakrishnan, Avoki Omekanda, Chandra Namuduri and Rashmi Prasad, General Motors, United States

P6106 *Deep Neural Network based Bearing Fault Diagnosis of Induction Motor using Fast Fourier Transform Analysis [#18847]*
Shrinathan Esakimuthu Pandarakone, Makoto Masuko, Yukio Mizuno and Hisahide Nakamura, NAGOYA INSTITUTE OF TECHNOLOGY, Japan; TOENEC CORPORATION, Japan

P6107 *Research on Vibration Suppression of FSCW-IPM with Auxiliary slots [#19332]*
Zhanchuan Wu and Ying Fan, Southeast University, China

P6108 *Diagnosis and Remediation of Single-Turn Short Circuit in a Multiphase FSCW PM Machine Based on a Novel T-type Equivalent Circuit [#18538]*
Fan Wu and Ayman EL-Refaie, Marquette University, United States

P6109 *A Novel Fault Detection and Identification Technique for IPMSM using Voltage Angle [#18894]*
Zia Ullah, Dong-Ho Lee and Jin Hur, Incheon university, korea, Korea (South)

P6110 *Vibration analysis of a Double-Stator Switched Reluctance Machine [#19692]*
Arash Hassanpour Isfahani and Babak Fahimi, Dynsity Technology Holdings Inc., United States; University of Texas t Dallas, United States

P6111 *Classification and Detection of Demagnetization and Inter-Turn Short Circuit Faults in IPMSMs by using Convolutional Neural Networks [#19096]*
Hyeyun Jeong, Hojin Lee and Sang Woo Kim, POSTECH, Korea (South)

P6112 *Frame-to-Shaft Voltage and End-to-End Shaft Voltage Analysis According to Eccentricity in IPMSMs [#19289]*
Jun-Kyu Park and Jin Hur, Korea Electronics Technology Institute, Korea, Republic of; Incheon National University, Korea, Republic of

P6113 *Accelerated Life Test of Bearing under Electrical Stress [#18997]*
JunHyuk Im, JunKyu Park and Jin Hur, Incheon National University, Korea (South); Korea Electronics Technology Institute, Korea (South)

P6114 *Online Monitoring of Capacitance and Dissipation Factor of Motor Stator Winding Insulation during Accelerated Life Testing [#19124]*
Pinjia Zhang, Prabhakar Neti and Karim Younsi, Tsinghua University, China; General Electric, United States

P6115 *Detecting Early-Stage Contamination in Journal Bearings Using Stator Current Measurements [#19675]*
Prayag Parikh and Robert Cox, EPRI, United States; UNC Charlotte, United States

P6116 *Finite Element Modeling and Experimental Verification of Radial and Axial Magnet Defects in a Permanent Magnet Synchronous Motor [#19131]*
Yucel Demir, Ersin Yolacan, Gurkan Kucukyildiz, Hasan Ocak and Metin Aydin, MDS Motor Design Ltd., Turkey; Dept.of Mechatronics Engr., Kocaeli University, Turkey

Plenary Poster Session: Low Speed, Special Machines and Machines in Renewable

Tuesday, September 25, 10:30AM-1:00PM, Room: Exhibit Hall A and A1, Chair: Daniel Ludois, Mazharul Chowdhury

P6301 *Exploring the Efficiency and Cost Limits of Fractional hp Axial Flux PM Machine Designs [#19652]*
Narges Taran, Vandana Rallabandi, Greg Heins and Dan M. Ionel, University of Kentucky, United States; Regal Beloit Corporation, Australia

P6302 *Methods for the Construction of Single-Sided Axial Flux Machines using Soft Magnetic Composites [#18532]*
Jamie Washington, Steven Jordan and Lars Sjoberg, Hoganas Great Britain Ltd, United Kingdom; Hoganas AB, Sweden

P6303 *Torque Performance of Halbach Consequent-pole Pseudo Direct-drive Machine [#18359]*
Hailin Huang, Dawei Li, Ronghai Qu and Wubing Kong, Huazhong University of Science and Technology, China; Huazhong University of Science and Technology, United States

P6304 *On the Scaling of Vernier Permanent Magnet Machines [#18509]*
Wenbo Liu, Lizhi Sun and Thomas Lipo, University of Wisconsin Madison, United States; Harbin Institute of Technology, China

P6305 *Design and Analysis of an Integrated Magnetic-Geared Permanent-Magnet Vernier Machine for a Large Telescope Drive Application [#19743]*
Wang Haitao, Fang Shuhua, Jahns Thomas, Yang Hui and Lin Heyun, Southeast University, China; University of Wisconsin, Madison, United States

P6306 *A Novel Magnetic Multiple Spur Gear for High Speed Motor System [#19615]*
Aiso Kohei and Akatsu Kan, Shibaura institute of technology, Japan

P6307 *Active damping of oscillations in the trans-rotary magnetic gear [#19250]*
Mohammad Amin Abolhasani and Siavash Pakdelian, University of Massachusetts Lowell, United States

P6308 *Comparison of control strategies for the backpack energy harvesting system [#19334]*
Mohammad Amin Abolhasani and Siavash Pakdelian, University of Massachusetts Lowell, United States

P6309 *Brushless AC and DC Motors and Drives for Low-Power Solar Photovoltaic Irrigation Pumps [#19655]*
Vandana Rallabandi, Damien Lawhorn, Dan Ionel and Ion Boldea, University of Kentucky, United States; Universitatea Politehnica Timisoara, Romania

P6310 *Modeling and Analysis of Self-excited Reluctance Generators for Wind Applications [#19031]*
Yawei Wang and Bianchi Nicola, University of Padova, Italy

P6311 *Ironless Dual-rotor permanent magnet machine for flywheel batteries [#18582]*
Alberto Bellini, Claudio Bianchini, Danilo David and Ambra Torreggiani, DEI, University of Bologna, Italy; Raw Power Group, Italy

Plenary Poster Session: Control of electric drives

Tuesday, September 25, 10:30AM-1:00PM, Room: Exhibit Hall A and A1, Chair: Fernando Briz, Mahesh Swamy

P6501 *Analysis of System Interharmonics of VSI-Fed Small DC-Link Drive [#19101]*
Dong Wang and Kaiyuan Lu, Aalborg University, Denmark

P6502 *Decoupled dq-axes Current Control for PMLSM based on Variable-Gain Adaptive Internal Model [#18064]*
Yang Rui, Wang Mingyi, Jiang Jialin, Tan Qiang and Li Liyi, Harbin Institue of Technology, China

P6503 *On-line Selective Harmonic Elimination Method with Seamless Dynamic Performance for VSI Drives [#19063]*
Ameer Janabi and Bingsen Wang, Michigan State University, United States

P6504 *Duty-ratio-based Direct Torque Control for Dual Three-phase Permanent Magnet Synchronous Machine Drives [#18874]*
Yuan Ren, Yun Li, Shiwu Zhu, Zijian Li, Ziqiang Zhu and James E. Green, The University of Sheffield, United Kingdom; Dynex Semiconductor Ltd., United Kingdom

P6505 *Flying capacitor multilevel motor drive using hierarchically implemented vector control [#19503]*
Christopher Brandon Barth, Nathan Andrew Pallo, Oscar Robert Azofeifa Castillo, Samantha Nicole Coday and Robert Pilawa-Podgurski, University of Illinois, United States; University of California at Berkeley, United States

P6506 *Implementation of SVM-DTC on the Integration System with Hybrid Energy Storage and Dual Three-Phase PMSM [#19464]*
Mufeng Xiong, Sideng Hu, Zipeng Liang and Xiangning He, zhejiang University, China; Zhejiang University, China

P6507 *Control Strategy for Dual Three-Phase Machines With Two Open Phases Providing Minimum Loss in the Full Torque Operation Range [#18165]*
Alejandro Yepes, Jesus Doval-Gandoy, Fernando Baneira and Hamid Toliyat, University of Vigo, Spain; Texas AM University, United States

P6508 *On the Effects of Position Sensor Resolution in Variable Speed Drives [#19239]*
Giacomo Scelba, Giulio De Donato, Giuseppe Scarcella and Fabio Giulii Capponi, University of Catania, Italy; Sapienza - University of Rome, Italy

P6509 *Improved Overmodulation Strategy in DTC with Constant Frequency Torque Controller of PMSM for Quick Torque Control at Different Dynamic Conditions [#18693]*
Ibrahim Mohd Alsofyani and Kyo-Beum Lee, Ajou University, Yemen; Ajou University, Korea (South)

P6510 *A PV-Grid Fed DTC Based Induction Motor Drive for Water Pumping [#18610]*
Saurabh Shukla and Bhim Singh, IIT Delhi, India

Plenary Poster Session: PM Motor Drive

Tuesday, September 25, 10:30AM-1:00PM, Room: Exhibit Hall A and A1, Chair: Fernando Briz, Mahesh Swamy

P6701 *An Improved Model Predictive Current Control Scheme for Open-Circuit Fault-Tolerant Five-Phase Flux-Switching Permanent Magnet Motor Drive [#18057]*
Wentao Huang, Wei Hua, Fuyang Chen and Fangbo Yin, Southeast University, China

P6702 *An Integrated Permanent-Magnet-Synchronous-Generator-Rectifier Architecture for Limited-Speed-Range Applications [#19284]*
Phuc Huynh, Patrick Wang and Arijit Banerjee, University of Illinois Urbana-Champaign, United States

P6703 *Phase-shift Decoupled SVPWM Control Strategy for Open Winding Permanent Magnet Synchronous Motor with Common DC Bus [#18978]*
Xiaoyong Zhu, Yuan Yuan, Yuefei Zuo, Xiaoxiao Bu and Bing Shi, Jiangsu University, China

P6704 *Guidelines for Optimum Bandwidth Selection in the Observers and Performance Investigation of DB-DTFC using Back-EMF Self-Sensing for SPM Machines [#19339]*
Shang Chuan Lee, Robert D. Lorenz and Kevin Lee, University of Wisconsin Madison, United States; Eaton Industrial Controls, United States

P6705 *Effects of Position Sensing Dynamics on Feedback Current Control of Permanent Magnet Synchronous Machines [#18436]*
Prerit Pramod, Zhang Zhe, Namburi Krishna MPK and Mitra Rakesh, Nexteer Automotive Corporation, United States

P6706 *Systematic Current Measurement Error due to Back EMF in PMSM Drives Adopting Synchronous Sampling [#19776]*
Jose Jacob, Sandro Calligaro and Roberto Petrella, Free University of Bolzano, Italy; University of Udine, Italy

P6707 *On-line Compensation of Periodic Error in Resolver Signals for PMSM Drives [#18530]*
Dongdong Chen, Jian Li, Junhua Chen, Ronghai Qu and Fengxiang Chen, State Key Laboratory of Advanced Electromagnetic, China

P6708 *Reference Flux Calculation Suitable for PWM overmodulation drive in Direct Torque Controlled PMSM Drive System [#19273]*
Yukinori Inoue, Ran Fujii, Shigeo Morimoto and Masayuki Sanada, Osaka Prefecture University, Japan

P6709 *Back-EMF Based Sensorless Control of IPMSM with Enhanced Torque Accuracy against Parameter Variation [#18637]*
Jiwon Yoo, Younggi Lee and Seung-Ki Sul, Seoul National University, Korea (South)

P6710 *Fault Tolerant Control for Open Winding PMSM System with Common DC Bus Based on 120 degree Decoupled Modulation Strategy [#19002]*
Xiaoyong Zhu, Xiaoxiao Bu, Yuefei Zuo, Yuan Yuan and Bing Shi, Jiangsu University, China

P6711 *Current Predictive Control for the semi-controlled Open-winding PMSM Generation System [#19706]*
Xiaoguang Zhang, Keqin Wang and Yi Li, North China University of Technology, China

Plenary Poster Session: Converter design 1

Tuesday, September 25, 10:30AM-1:00PM, Room: Exhibit Hall A and A1, Chair: Yu Du, Alex Huang

P6901 *Comprehensive Analysis of Trade-off between Noise and Wide Band-Gap (WBG) Device Switching Speed [#18450]*
Pengkun Liu, Suxuan Guo, Yu Ruiyang, Huang Alex and Zhang Liqi, The University of Texas at Austin, United States; Texas Instruments, United States

P6902 *GaN based Switched Capacitor Three Level Buck Converter with Cascaded Synchronous Bootstrap Gate-Drive Scheme [#18615]*
Suvankar Biswas and David Reusch, Efficient Power Conversion Corporation, United States

P6903 *Sensitivity of GaN FET Active Gate Driving Profiles to Current and Temperature [#18967]*
Jeremy J. O. Dalton, Jianjing Wang, Harry C. P. Dymond, Dawei Liu, David Drury and Bernard H. Stark, University of Bristol, United Kingdom

P6904 *Desaturation Detection for Paralleled GaN e-HEMT Phase Leg [#19344]*
Yingying Gui, Sun Bingyao, Rolando Burgos, Sandeep Bala and Jing Xu, Center for Power Electronics Systems, United States; ABB Corporate Research, United States

P6905 *Passive Level Shifter for Suppression of Crosstalk in SiC-based Bridge Leg [#19469]*
Blue Ho-Tin Tang, Henry Shu-Hung Chung, John Wing-To Fan and Ryan Shun-Cheung Yeung, City University of Hong Kong, Hong Kong

P6906 *Coordinated Switching with SiC MOSFET for Increasing Turn-off dV/dt of Si IGBT [#19560]*
Patrick Palmer, Jin Zhang, Xueqiang Zhang, Tianqi Zhang and Edward Shelton, University of Cambridge, United Kingdom; University of Cambridgeu, United Kingdom

P6907 *A Novel Gate Control for 3.3kV Super-Cascaded-MOSFET [#19752]*
Liqi Zhang, Xin Zhao, Xiaoqing Song and Alex Q. Huang, University of Texas at Austin, United States; ABB, United States

P6908 *Accurate Current Measurements of a High Frequency GaN Inverter for Magnetic Characteristic Evaluation [#18992]*
Wilmar Martinez, Keisuke Fujisaki and Jorma Kyyra, KU Leuven, Belgium; Toyota Technological Institute, Japan; Aalto University, Finland

P6909 *Phase Shift Reduction for Integrated Field-based Current Sensing in Ni-plated SiC Power Modules [#19068]*
Minhao Sheng, Muhammad Alvi and Robert Lorenz, University of Wisconsin-Madison, WEMPEC, United States

P6910 *Hetero-Magnetic Swinging Inductor (HMSI) and Its Application for Power Factor Correction Converters [#19073]*
Shengchang Lu, Chao Ding, Lanbing Liu, Yunhui Mei, Khai Ngo and Guoquan Lu, Virginia Tech, United States; Tianjin University, China

P6911 *A thermal network model for planar transformers in photovoltaic inverters [#19626]*
Shen Zhan, Shen Yanfeng and Wang Huai, Aalborg University, Denmark

P6912 *The Parasitic Capacitance of Inductors with Ferrite Cores Due to the Time-Varying Electromagnetic (EM) Field [#19775]*
Hui Zhao, Yiming Li, Qiang Lin and Shuo Wang, University of Florida, United States; Kyushu University, Japan

P6913 *Silicon Carbide Inverter for EV/HEV Application featuring Multistage Drive Circuit Technology for Low Switching Loss and Surge Peak Reduction [#18458]*
Taku Shimomura, Keiichiro Numakura, Daiki Sato and Tetsuya Hayashi, Nissan Motor Co., Ltd, Japan

Plenary Poster Session: Emerging Technologies and Applications (II)

Tuesday, September 25, 10:30AM-1:00PM, Room: Exhibit Hall A and A1, Chair: Liming Liu, Xiu Yao

P7101 *Power System Design Considerations for a Seafloor Mining Crawler [#19018]*
Razieh Nejati Fard and Elisabetta Tedeschi, Norwegian University of Science and Technology, Norway

P7102 *An Adaptive Sensorless Measurement Technique for Internal Temperature of Li-ion Batteries Using Impedance Phase Spectroscopy [#18839]*
Ala Hussein and Abbas Fardoun, Yarmouk University, Jordan; Lebanese International University, Lebanon

P7103 *A Sensorless Surface Temperature Measurement Method for Batteries using Artificial Neural Networks [#18835]*
Ala Hussein, Yarmouk University, Jordan

P7104 *Development of a Wideband High-Precision Current Sensor for Next Generation Power Electronics Applications [#18160]*
Masayuki Harano, Hajime Yoda, Kenichi Seki, Kazunobu Hayashi, Tetsuya Komiyama and Shuhei Yamada, HIOKI E.E. Corporation, Japan

P7105 *Power Electronics Testbed for Converting Methane to Liquid Fuels via Electrical Corona [#18225]*
Annette von Jouanne, Scott Harpool, Adam Shareghi and Alex Yokochi, Baylor University, United States; Oregon State University, United States

P7106 *Comparison of Overload Protection Methods for LLC Resonant Converters in MVDC Applications [#18320]*
Hemant Bishnoi, Silverio Alvarez, Gabriel Ortiz and Francisco Canales, ABB Schweiz AG, Switzerland

P7107 *Design and Implementation of an optimized 100 kW stationary wireless charging system for EV battery recharging [#19238]*
Veda Prakash Galigekere, Jason Pries, Omer Onar and Gui-jia Su, Oak Ridge National Laboratory, United States

P7108 *Energy Harvesting from Magnetic fields of the Overhead Transmission Lines [#19756]*
Syed Najafi, Awab Ali, Yilmaz Sozer and Alex De Abreu-Garcia, University of Akron, United States

P7109 *A Flexible Load-Independent Multi-Output Wireless Power Transfer System Based on Double-T Resonant Circuit Technique [#18220]*
Yong Li, Jiefeng Hu, Kevin K. W. Chan and Eric K. W. Cheng, Department of Electrical Engineering,The Hong Ko, Hong Kong

P7110 *A GUI based Automatic Tester with A Novel Heating Method for Power Semiconductor Device Dynamic Measurement [#19274]*
Qingxuan Ma, Liqi Zhang and Alex Huang, University of Texas at Austin, United States

P7111 *A New IH-Coils Placement for Small-Foreign-Metal Particles Detection Using 400 kHz SiC-MOSFETs Inverter [#19766]*
Takuya Shijo, Yuki Uchino, Yujiro Noda, Hiroaki Yamada and Toshihiko Tanaka, Yamaguchi University, Japan

Tuesday, September 25, 2:30PM-5:00PM

Plenary Poster Session: Renewable Energy Systems

Tuesday, September 25, 2:30PM-5:00PM, Room: Exhibit Hall A and A1, Chair: Ke Ma, Ahmet Yeksan

P7301 *Effect of Anode and Cathode Relative Humidity Variance and Pressure Gradient on Polymer Electrolyte Membrane Fuel Cell (PEMFC) Performance [#18008]*
Emmanuel Balogun, Paul Barendse and Jessica Chamier, University of Cape Town, South Africa

P7302 *Active Adaptive Fault-Tolerant Control Design for PEM Fuel Cells [#19042]*
Alireza Abbaspour, Kang Yen, Parisa Frouzannezhad and Arman Sargolzaei, Florida international university, United States; Florida Polytechnic University, United States

P7303 *Current Ripple Reduction Control for ZVS Operation of a Fuel Cell System [#19370]*
Yong Dae Kwon, Jin-Hyuk Park and Kyo-Beum Lee, Ajou University, Korea (South)

P7304 *Power Electronics Based System Design for MW Integrated Gasification Fuel Cell (IGFC) [#19569]*
Shujun Mu and George You Zhou, National Institute of CleanandLow Carbon Energy, China

P7305 *Realization of a 10 kW MES Power to Methane Plant based on unified AC/DC Converter [#18645]*
Mahdi Shahparasti, Alvaro Luna, Joan Rocabert, Pau Bosch and Pedro Rodriguez, Technical University of Catalonia, Spain; Leitat Technological Center, Spain

P7306 *A Double-input Photovoltaic Inverter System with a Soft-Switched Magnetically Coupled AC/DC Bi-directional Circuit for Energy Storage Application [#19204]*
Joanne Hui and Praveen K. Jain, Queen's University, Canada

P7307 *An Isolated DC-AC Converter Module Integrating Renewable Energy Source(RES) and Energy Storage(ES) for Cascaded Inverter [#19240]*
Ritwik Chattopadhyay and Subhashish Bhattacharya, North Carolina State University, United States

P7308 *Magnetic Field Energy Harvester and Management Algorithm for Power Tower Sensors [#19744]*
Awab Ali, Yilmaz Sozer and Alex De Abreu Garcia, University of Akron, United States

P7309 *Advanced Model Predictive MPPT and Frequency Regulation In Interconnected Wind Turbine Drivetrains [#18562]*
Mohsen Farbood, Mokhtar ShaSadeghi, Afshin Izadian and Taher Niknam, Shiraz University of Technology, Iran; Purdue School of Engineering and Technology, United States

Plenary Poster Session: Power Control and Protection

Tuesday, September 25, 2:30PM-5:00PM, Room: Exhibit Hall A and A1, Chair: Behrooz Mirafzal, Mohammad B Shadmand

P7501 *Design and Analysis of the Compounded Control System of Hybrid Distribution Transformer [#18346]*
Yibin Liu, Deliang Liang, Yang Liang, Mingkang Zhang and Qixu Chen, Xi'an Jiaotong University, China

P7502 *Sic Based Latching Current Limiter For High Voltage Space Power Distribution Systems [#18394]*
David Marroqui, Ausias Garrigos, Jose Manuel Blanes, Roberto Gutierrez and Enrique Maset, Miguel Hernandez University of Elche, Spain; University of Valencia, Spain

P7503 *A Novel Hybrid DC Circuit Breaker Based on Pre-charged Capacitors [#18574]*
Han Ye, Wu Chen and Liangcai Shu, Southeast University, China

P7504 *Snubber Circuit of Bidirectional Solid State DC Circuit Breaker Based on SiC MOSFET [#18575]*
Dongho Shin, Seung-Ki Sul, Jungwook Sim and Young-Geun Kim, Seoul National University, Korea (South); LSIS Co., Ltd, Korea (South)

P7505 *A Novel Hybrid Islanding Detection Method Combining VU/THD and BRPV [#18707]*
Gongke Wang and Feng Gao, Shandong University, China

P7506 *Capacitor Voltage Balancing in Hybrid Cascaded Multilevel Inverter Using Genetic Algorithm at Higher Modulation Indices [#19048]*
Abhinandan Routray, Rajeev Kumar Singh and Ranjit Mahanty, Indian Institute of Technology (BHU), Varanasi, India

P7507 *Ground leakage Current Mitigation for Three-Phase Current Source Inverters [#19075]*
Emilio Lorenzani, Giovanni Migliazza and Fabio Immovilli, University of Modena and Reggio Emilia, Italy

P7508 *Implementation of a Self-balancing Control for Series IGBTs [#19089]*
Lu Yue and Xiu Yao, University at Buffalo, United States

P7509 *Analysis of HVDC Inertia Emulation Impact on Connected AC Systems [#19245]*
Shuyao Wang, Shuoting Zhang, Yiwei Ma, Fred Wang and Leon Tolbert, University of Tennessee, United States

P7510 *Experimental Study of Series DC Arc in Distribution Systems with Constant Power Loads [#19304]*
Xiu Yao, Lu Yue and Haiwei Cai, University at Buffalo, United States; Ansys, Inc, United States

P7511 *Four-Wire Inverters Based on Cascaded Transformer With Single Dc-link [#19328]*
Joao Mello, Gregory Carlos, Cursino Jacobina and Alan Felinto, Federal University of Campina Grande, Brazil; Federal Institute of Alagoas, Brazil; Federal Univeristy of Campina Grande, Brazil

P7512 *Power Oscillation Damping by MMC-HVDC based on Phase-Locked Loop Measurement [#19360]*
Jiang Haihao and Boon-Teck Ooi, McGill University, Canada

P7513 *Utility-Scale PV Generator Impedances in DQ Frame under Different Q Control Modes [#19460]*
Ye Tang, Rolando Burgos, Chi Li and Dushan Boroyevich, CPES, Virginia Tech, United States

P7514 *Grounded Controllable Network Transformer for Power Flow Control - Demonstration of a 12.47kV 3-Phase 1MVA Power Router [#19475]*
Mickael J. Mauger, R. P. Kandula, Frank Lambert and Deepak Divan, Georgia Institute of Technology, United States

Plenary Poster Session: Microgrid Systems

Tuesday, September 25, 2:30PM-5:00PM, Room: Exhibit Hall A and A1, Chair: Adel Nasiri, Babak Parkhideh

P7701 *Event-based Distributed Power Sharing Control for Photovoltaic Generators in AC Microgrids [#18239]*
Jingang Lai and Xiaoqing Lu, Huazhong University of Science and Technology, China; Wuhan University, China

P7702 *Stabilizing Droop Variation of Converter-connected Generation in Autonomous Microgrids with Virtual Inertia Control [#18303]*
Lalitha Subramanian and Hoay Beng Gooi, Energy Research Institute at NTU, Singapore; School of EEE, Nanyang Technological University, Singapore

P7703 *Cooperative Optimization of Electric Vehicles and Renewable Energy Sources in Regional Multi-microgrid System [#18405]*
Jin Chen, Changsong Chen and Shanxu Duan, Huazhong University of Science and Technology, China

P7704 *Dynamic Phasor Modeling and Transient Analysis of a Microgrid under Unbalanced Conditions [#18437]*
Yelun Peng, Zhikang Shuai, Josep M. Guerrero, Chao Shen and John Shen, Hunan University, China; Aalborg University, Denmark; Illinois Institute of Technology, United States

P7705 *An Alternative Realization of Droop Control and Virtual Impedance for Paralleled Converters in DC Microgrids [#18503]*
Zheming Jin and Josep M. Guerrero, Aalborg University, Denmark

P7706 *Sizing of Energy Storage System for Power Restoration in Different Types of Islanded Microgrid Aided by Load-Characterization and Modeling [#18567]*
Asif Anwar and Mohd Hasan Ali, Schneider Electric, United States; University of Memphis, United States

P7707 *Investigation of Grid-Connected and Islanded Direct Matrix Converter for the Renewable Microgrid Applications with Model Predictive Control [#18787]*
Jianwei Zhang, Li Li, David Dorrell, Jose Rodriguez and Margarita Norambuena, University of Technology Sydney, Australia; University of KwaZulu-Natal, South Africa; Universidad Andres Bello, Chile

P7708 *High Performance Unified Control for Interlinking Converter in Hybrid AC/DC Microgrid [#19150]*
Fanxiu Fang, Yun Wei Li and Xialin Li, University of Alberta, Canada; Tianjin University, China

P7709 *Reducing Energy Consumption in Industrial Plants using Behind-the-Meter Conservation Voltage Reduction [#19645]*
Sathish Jayaraman, Mohammadreza Miranbeigi, Prasad Kandula and Deepak Divan, Georgia Tech, United States

P7710 *Efficient Power Flow Management and Peak Shaving in a Microgrid-PV System [#19527]*
Sakshi Mishra and Praveen Palanisamy, American Electric Power, United States; General Motors, United States

P7711 *Optimal DER Sizing Using Microgrid Design Tool Integrating Model Predictive Control Based Energy Management - A Case Study [#18569]*
Asif Anwar, Patrick Beguery, Peter Pflaum, Jackie Huynh and Jacob Friedman, Schneider Electric, United States; Schneider Electric, France

P7712 *A Novel Multi-stage Economic Dispatch of Microgrid Based on Consensus Protocol of Multi-Agent System [#18720]*
Zhiwen Yu, Yuquan Liu, Wen Xiong, Li Wang, Ying Cai, Renbo Wu, Huangsheng Hua and Shunqi Zeng, Guangzhou Power Supply Co., Ltd, China

P7713 *A Synthesized Control Scheme for Large Signal Stabilization of DC Microgrids [#18146]*
Pengfeng Lin, Chuanlin Zhang, Peng Wang and Jianfang Xiao, Nanyang Technological University, Singapore; Shanghai University of Electric Power, China

Plenary Poster Session: Datacenters and Telecommunication Applications

Tuesday, September 25, 2:30PM-5:00PM, Room: Exhibit Hall A and A1, Chair: Norbert Grass, Alexis Kwasinski

P7901 *An Optimized Inductor Current Control for Intermediate Bus Converter With Hybrid-Switching Structure [#18402]*
Ying Li and Xinbo Ruan, Nanjing Univ. of Aero. and Astro., China

P7902 *A 95%-Efficient 48V-to-1V/10A VRM Hybrid Converter Using Interleaved Dual Inductors [#18512]*
Gab-Su Seo, Ratul Das and Hanh-Phuc Le, University of Colorado, United States

P7903 *An Isolated Composite Resonant Multilevel Converter with Partial Power Voltage Regulation for Telecom Application [#19168]*
Yanchao Li, Xiaofeng Lyu, Ze Ni, Jalen Johnson and Dong Cao, North Dakota State University, United States; Navitas Semiconductor .Inc, United States, United States

P7904 *High-Performance Single-Stage Isolated 48V-to-1.8V Point-of-Load Converter Utilizing Impedance Control Network and Distributed Transformer [#19268]*
Ashish Kumar, Saad Pervaiz and Khurram Afridi, University of Colorado Boulder, United States

P7905 *Loss Model and Optimization Method of Switched-Capacitor Divider for POL Application [#18327]*
Owen Jong, Qiang Li, Fred C. Lee and Brian Carpenter, Student, United States; Professor, United States; Sponsor, United States

P7906 *Structure and Implementation of A Hybrid 48V/380V DC UPS for IT Datacenters [#19578]*
Cong Wang, Shangzhi Pan and Praveen Jain, Queen's University, Canada

P7907 *Accelerated Lifetime Testing of High Power Lithium Titanate Oxide Batteries [#19211]*
Ana-Irina Stroe, Daniel-Ioan Stroe, Vaclav Knap, Maciej Swierczynski and Remus Teodorescu, Aalborg University, Denmark; Lithium Balance, Denmark

Plenary Poster Session: Electric Propulsion & Other E-transportation applications
Tuesday, September 25, 2:30PM-5:00PM, Room: Exhibit Hall A and A1, Chair: Christopher Belcastro, Ean Amon

P8101 *Design and Testing of a Planarized High Power Density 135 kW SiC Traction Inverter with 1 kV DC-Link [#19162]*
Li Yang, Yukun Luo, Radha Sree Krishna Moorthy, Dhrubo Rahman, Wensong Yu and Iqbal Husain, North Carolina State Univ., United States

P8102 *A Multi-Source Inverter for Electric Drive Vehicle Applications [#19251]*
Salari Omid, Hashtrudi Zaad Keyvan, Bakhshai Alireza and Jain Praveen, Queen's university, Canada

P8103 *High-Voltage Dual-Inverter Drivetrain Topology for Electric Vehicles with Integrated On-board Three-Phase AC Charger [#19371]*
Philippe Gray and Peter Lehn, University of Toronto, Canada

P8104 *A SiC-Based 100kW High-Power-Density (34 kW/L) Electric Vehicle Traction Inverter [#19375]*
Chi Zhang, Srdjan Srdic, Srdjan Lukic, Edward Choi, Yonghan Kang and Ehsan Tafti, FREEDM Systems Center, NC State University, United States; G Electronics Vehicle Components USA LLC (LGEVU), United States

P8105 *Regenerative Braking Performance of Different Electric Vehicle Configurations Considering Dynamic Low Speed Cutoff Point [#18565]*
Shoeib Heydari, Poria Fajri and Iqbal Husain, University of Nevada, Reno, United States; North Carolina State University, United States

P8106 *Optimal Design and Experimental Prototype Testing of a Low-Cost Machine for City Battery Electric Vehicle [#18423]*
Tuan-Vu Tran, Edouard Negre, Karim Mikati and Bassel Assaad, Renault, France; Nissan, Japan

P8107 *Development of high power 48V powertrain components for mild hybrid light duty vehicle applications [#19007]*
Anthony Wearing, Ozge Taskin, Benchebra Dalil, Bao Ran, Baxter James and Rouaud Cedric, Ricardo Innovations Ltd, United Kingdom; Ricardo UK Ltd, Turkey; Ricardo UK Ltd, France; Ricardo UK Ltd, China; Ricardo UK Ltd, United Kingdom

P8108 *Direct drive propeller systems modelling and active protection [#18103]*
Jishnu Kambrath, Changwoo Yoon and Liu Xiong, NANYANG TECHNOLOGICAL UNIVERSITY, Singapore; Rolls Royce NTU CORPORATE LAB, Singapore; Rolls Royce Singapore Pte Ltd, Singapore

P8109 *Mitigation of DC-Link Voltage Oscillations Caused by Resolver Error in an Electric Vehicle Drivetrain [#18265]*
Ayesha Sayed, Dionysios Aliprantis, Long Wu, Guozhen Zhou and Sumit Dutta, Purdue University, United States; John Deere Electronic Solutions, United States

P8110 *A Method to Minimize Current Ripple of DC Link Capacitor for 48V Inverter Integrated Starter/Generator [#18431]*
Sang Min Kim and Taesuk Kwon, Hyundai Mobis, Korea (South)

P8111 *Bidirectional Transformerless EV Charging System via Reconfiguration of 4x4 Drivetrain [#19562]*
Liwei Zhou and Matthias Preindl, Columbia University, United States

P8112 *Traction System Assessment of a Commercialized Battery Electric Vehicle with User-defined Driving Cycles [#19476]*
Nan Zhao, Scott McCrindle, Rong Yang and Nigel Schofield, McMaster University, Canada; Georgian College, Canada; University of Huddersfield, United Kingdom

P8113 *Modeling and Simulation of Double-Train Macroscopic Representation Emulator in Urban Rail Transit [#18242]*
Jingda Gu, Xiaofeng Yang and Trillion Q. Zheng, Beijing Jiaotong University, China

P8114 *Influencing Factors in Low Speed Regenerative Braking Performance of Electric Vehicles [#18566]*
Shoeib Heydari, Poria Fajri and Nima Lotfi, University of Nevada, Reno, United States; Southern Illinois University Edwardsville, United States

P8115 *A Resonant Multilevel Modular Converter with Partial Power Voltage Regulation for Automotive Applications [#19236]*
Jalen Johnson, Yanchao Li, Ze Ni, Xiaofeng Lyu and Dong Cao, North Dakota State University, United States; Navitas Semiconductor, United States

P8116 *Modeling and Hardware-in-the-Loop Real-Time Simulation for the Speed Control of Hybrid Electric Vehicles [#18659]*
Mohammad Hassan Khooban, Navid Vafamand and Tomislav Dragicevic, Aalborg University, Denmark

P8117 *An Efficient Reference Modulation based Control Strategy for Active Hybrid Energy Management of EVs [#19400]*
Yanhui Zhou, Zhiwu Huang, Hongtao Liao, Heng Li, Yun Jiao and Jun Peng, Central South University, China

Plenary Poster Session: AC-AC converters Poster 2

Tuesday, September 25, 2:30PM-5:00PM, Room: Exhibit Hall A and A1, Chair: Robert S. Balog, Patrick Wheeler

P8301 *A single-phase ac to three-phase ac converter with a small link capacitor [#18676]*
Masih Khodabendeh and Mahshid Amirabadi, Northeastern University, United States

P8302 *Low-Cost High-Efficiency Single-Stage Solid-State Transformer for Lighting Applications [#19547]*
Danish Shahzad, Saad Pervaiz and Khurram Afridi, University of Colorado Boulder, United States

P8303 *Power Control Capabilities of the ROMAtrix Converter [#19709]*
Sabino Pipolo, Stefano Bifaretti, Marco Di Giacomo, Alessandro Lidozzi, Luca Solero and Pericle Zanchetta, University of Nottingham, United Kingdom; University of Rome "Tor Vergata", Italy; Roma Tre University, Italy

P8304 *Three-Leg Single-Phase Universal Active Power Filter [#19295]*
Phelipe Leal Serafim Rodrigues and Cursino Brandao Jacobina, Federal University of Campina Grande, Brazil

P8305 *Over-modulation Operation of Multiple-Channel Indirect Matrix Converter System [#18576]*
Xiuyun Huang, Zheng Wang, Xueqing Wang, Lei Guan and Ming Cheng, Southeast University, China

P8306 *Enhanced One-Step Commutation Approach for Direct Converters Based on UCE-Measurement [#19161]*
Nico Remus, Martin Leubner and Wilfried Hofmann, Technische Universitaet Dresden, Germany

Plenary Poster Session: Multi-level converters Poster 9

Tuesday, September 25, 2:30PM-5:00PM, Room: Exhibit Hall A and A1, Chair: Matthias Preindl, Navid Zargari

P8501 *An Increased-Levels Model Predictive Control (MPC) Method for Modular Multilevel Converter (MMC) [#19013]*
Xingxing Chen, Jinjun Liu, Shaodi Ouyang and Shuguang Song, Xi'an Jiaotong University, China

P8502 *Suitable Submodule Switch Rating for Modular Multilevel Converter Design in Medium Voltage Applications [#19118]*
Aditya Shekhar, Laura Ramirez-Elizondo, Zian Qin and Pavol Bauer, Delft University of Technology, Netherlands

P8503 *Reduction of Common Mode Voltage Reference Voltage Modulation in MMC system [#19565]*
ChangHwan Park, InKyo Seo and JangMok Kim, Pusan National University, Korea, Republic of

P8504 *Comparison of phase shift and submodule tolerance band nearest level modulation for medium voltage modular multilevel converter design [#18773]*
Andrey Dudin, Ara Bissal and Ilknur Colak, Dr., Germany

P8505 *Effect of Battery Power on Capacitor Voltage Ripple Characteristics in a Modular Multilevel Converter with Integrated Battery Energy Storage System [#18910]*
Tao Wang, Hua Lin, Zhe Wang and Yajun Ma, State Key Laboratory of Advanced Electromagnetic, China

P8506 *Six-Phase Open-End Winding Rectifier With Low Harmonic Distortion and Reduced Switch Count [#19280]*
Ivan da Silva and Cursino Brandao Jacobina, Federal University of Campina Grande, Brazil

P8507 *Development of A Flexible Modular Multilevel Converter Test-Bed [#19040]*
Shuoting Zhang, Shuyao Wang, Nattapat Praisuwanna, Le Kong, Bob Martin, Fred Wang and Leon Tolbert, The University of Tennessee, United States; the University of Tennessee, United States

P8508 *Regions of Operation of Single-Phase Cascaded H-Bridge Inverters [#19154]*
Amanda Monteiro, Cursino Jacobina, Joao Mello, Nayara De Freitas and Rafael Matias, Federal University of Campina Grande, Brazil; Federal University of Piaui, Brazil

P8509 *A Real-Time Real-Power Emulator of a Medium-Voltage High-Speed Induction Motor and its Mechanical Load [#18401]*
Saito Kenichiro and Akagi Hirofumi, Tokyo institute of technology, Japan

P8510 *Current Source Modular Multilevel Converter with Reduced Number of Components [#19287]*
Faleh Alskran and Marcelo Simoes, Colorado School of Mines, United States

Plenary Poster Session: Model Predictive Control of Power Converters

Tuesday, September 25, 2:30PM-5:00PM, Room: Exhibit Hall A and A1, Chair: Ralph Kennel, Shafiq Ahmed Odhano

P8701 *Real-Time Implicit Model Predictive Control for 3-phase VSI [#19609]*
Valerio Sabatini, Andrea Formentini, Alessandro Lidozzi, Stefano Bifaretti, Luca Solero and Pericle Zanchetta, C-PED, Roma Tre University, Italy; University of Nottingham, United Kingdom; C-PED, University of Roma Tor Vergata, Italy

P8702 *Modularized Model Predictive Control scheme with capacitor voltage balance control for Single-Phase Cascaded H-bridge Rectifier [#18801]*
Xiajie Wu, Southwest Jiaotong University, China

P8703 *Carrier-Based Model Predictive Pulse Pattern Control [#18139]*
Tobias Geyer and Vedrana Spudic, ABB Corporate Research, Switzerland

P8704 *Computationally Efficient Model Predictive Control for a Four-Leg Inverter with Common Mode Voltage Elimination [#18469]*
Muslem Uddin, Galina Mirzaeva and Graham Goodwin, The University of Newcastle, Australia

P8705 *Three-Vector-Based Model Predictive Direct Power Control Strategy for PWM Rectifier [#18531]*
Hui Li, Mingyao Lin, Jian Ai, Beibei Zhang and Wei Le, Southeast University, China

P8706 *A MPC-based Method for Single-Inductor Multiple-Input Single-Output Boost Converter [#18046]*
Benfei Wang, Liang Xian, Xinan Zhang and Hoay Beng Gooi, Nanyang Technological University, Singapore

P8707 *A Novel Model Predictive Control Method with Discrete Space Vector Modulation for Neutral-point Voltage Balancing of Vienna-type Rectifier [#18677]*
Wenjie Zhu, Changsong Chen, Bangyin Liu and Shanxu Duan, Huazhong University of Science and Technology, China

P8708 *Simplified Model Predictive Control of Four-Leg Inverters for Stand-alone Power Systems [#18313]*
Md Abul Bashar Sarkar, Md. Binye Amin, Wasi Azim and Kazi Saiful Alam, Infineon Technologies AG, Germany; Eastern University, Bangladesh; University of New South Wales (UNSW), Australia

Plenary Poster Session: Reliability, Diagnostic and Faults Analysis in Power Converters

Tuesday, September 25, 2:30PM-5:00PM, Room: Exhibit Hall A and A1, Chair: Marco Liserre, Jun Wang

P8901 *Multiple Device Open Circuit Fault Diagnosis for T-Type Inverters [#19690]*
Ali Topcu and Yilmaz Sozer, University of Akron, United States

P8902 *Fault Prognostics of Multilevel Inverters Using On-State Resistance Evolution [#19720]*
Weiqiang Chen and Ali Bazzi, University of Connecticut, United States

P8903 *EMI Diagnostics Of Three-Phase Inverters Using Machine Learning Algorithms [#19763]*
Matthew Boubin, Mark Scott, Yamuna Rajasekhar, Wilson Guo and John Patrick Doran, Miami University, United States

P8904 *Active Thermal Control of Asynchronously-Connected Grids Considering Load Sensitivity to Voltage [#18730]*
Markus Andresen, Giovanni De Carne, Mike Schloh and Marco Liserre, University of Kiel, Germany, Germany

P8905 *Impact of Long-term Mission Profile Sampling Rate on the Reliability Evaluation of PV Applications [#19213]*
Ionut Vernica, Huai Wang and Frede Blaabjerg, Aalborg University, Denmark

P8906 *Selection of Observer Gains in an Observer Based Fault Detection System for a Digitally Controlled DC-DC Converter [#18459]*
John Tsinetakes, Lockheed Martin, United States

P8907 *Reactive Power Impacts on LCL Filter Capacitor Lifetime and Reliability in Grid-connected Inverter [#19721]*
Dao Zhou, Huai Wang and Frede Blaabjerg, Aalborg University, Denmark

P8908 *Reliability Oriented Design of Dual Active Bridge Converter for Power Supply on Heavy-Vehicles [#19661]*
Suyash Sushilkumar Shah and Subhashish Bhattacharya, North Carolina State University, United States

P8909 *Online Degradation Detection Method for Voltage Regulation and Efficiency in Digitally-Controlled Switching Mode Power Supply [#18263]*
Hiroshi Nakao, Yu Yonezawa, Yoshiyasu Nakashima and Fujio Kurokawa, Fujitsu Laboratories ltd., Japan; The Nagasaki Institute of Applied Science, Japan

P8910 *Online Condition Monitoring of Bond Wire Degradation in Inverter Operation [#18482]*
Fernando Gonzalez-Hernando, Jon San-Sebastian, Asier Garcia-Bediaga, Manuel Arias, Francesco Iannuzzo and Frede Blaabjerg, IK4-IKERLAN Technology Research Centre, Spain; University of Oviedo, Spain; Aalborg University, Denmark

P8911 *Mission Profile based Power Converter Reliability Analysis in a DC Power Electronic based Power System [#19146]*
Saeed Peyghami, Huai Wang, Pooya Davari and Frede Blaabjerg, Aalborg University, Denmark

P8912 *Investigation on Fault Tolerant Operation Strategy of Seven-level ANPC Inverter [#18179]*
Weihui Sheng and Qiongxuan Ge, University of Chinese Academy of Sciences, China; Institute of Electrical Engineering, CAS, China

P8913 *Open-Switch Fault Diagnosis and Tolerant Control Methods for a Vienna Rectifier using Bi-Directional Switches [#19341]*
June-Seok Lee and Kyo-Beum Lee, Korea Railroad Research Institute, Korea (South); Ajou University, Korea (South)

Plenary Poster Session: Stability in Power Converters

Tuesday, September 25, 2:30PM-5:00PM, Room: Exhibit Hall A and A1, Chair: Brendan McGrath, Zheng Wang

P9101 *Positive Feed-forward Control Design for DC Bus Stabilization of a Multi-Converter System Using a Pole Placement Approach [#18769]*
Silvia Arrua, Hessamaldin Abdollahi and Enrico Santi, University of South Carolina, United States

P9102 *Stability Analysis for Two-stage Cascaded DC-DC Converters System based on Describing Function Method [#19601]*
Hong Li, Chen Liu, Xiaochao Zhang, Zhongya Guo and Trillion Q. Zheng, Beijing Jiaotong University, China

P9103 *Eigenvalue Sensitivity of Stability Analysis for a Droop Controlled Inverter [#18343]*
Yang Li, Zhikang Shuai and John Shen, Col. of Elec. and Info Eng, Hunan University, China; Dept. of Elec and Cmpt Eng,Illinois Institute of, United States

P9104 *Parameters Sensitivity Analysis of Circulating Resonance in Islanded Micro-grid with Aggregated Droop-based Control Inverters [#18369]*
Xiayun Feng, Fei Wang, Lijun Zhang, Yufei Li, Hui Guo and Jian Luo, Shanghai University, China

P9105 *Stability Analysis of a Droop-Controlled Grid-Connected VSC [#19188]*
Leonardo Marin, Andres Tarraso, Jose Ignacio Candela and Pedro Rodriguez, Technical University of Catalonia, Spain; Universidad de Loyola, Spain

P9106 *Large Signal Modeling and Stability Analysis of Photovoltaic-Battery Hybrid Power System [#19035]*
Huizi Ji, Meng Huang and Xiaoming Zha, School of Electrical Engineering, Wuhan Univ., China

P9107 *Impedance-Based Sensitivity-Criterion for Three-Phase Inverter [#18162]*
Tommi Reinikka, Roni Luhtala, Tuomas Messo and Tomi Roinila, Tampere University of Technology, Finland

P9108 *Modeling and Power Hardware-in-the-Loop Emulation of Resonant Grid Impedance [#18152]*
Henrik Alenius, Tommi Reinikka, Tuomas Messo and Tomi Roinila, Tampere University of Technology, Finland

Plenary Poster Session: Other Topics in Converter Design and Control

Tuesday, September 25, 2:30PM-5:00PM, Room: Exhibit Hall A and A1, Chair: Vito Giuseppe Monopoli, Alessandro Lidozzi

P9301 *Modeling and Management of Circulating Common-Mode Currents in Paralleled Non-Isolated DC-DC Converter-Based Systems [#19602]*
Aaron Brovont and Robert Cuzner, University of Alabama, United States; University of Wisconsin-Milwaukee, United States

P9302 *Conducted EMI Modelling for EV Drives Considering Switching Dynamics and Frequency Dispersion [#19055]*
Yuxin Xia, Yunjie Gu and Jie Shen, Leadrive Technology (Shanghai) Co., China; Imperial College London, United Kingdom; Jiangsu Industrial Technology Research Institute, China

P9303 *Radiated EMI Modeling of the Non-isolated DC-DC Power Converters with Attached Cables [#19779]*
Huan Zhang, Yingjie Zhang and Shuo Wang, University of Florida, United States

P9304 *Conducted EMI of Interleaved CCM Boost PFC Converter with Different Coupling Coefficients [#18750]*
Fei Yang, Yong Cao, Chun hui Li, Fu ming Peng, Jiao Yang and Han Hua, Nanjing University of Science and Technology, China

P9305 *Magnetic Core Characterization and Common-mode Choke Design Considering Cryogenic Cooling [#19275]*
Ruirui Chen, Zhou Dong, Zheyu Zhang, Handong Gui, Jiahao Niu, Ren Ren, Fred Wang, Leon Tolbert, Daniel Costinett, Benjamin Blalock, Benjamin Choi and Gerald Brown, University of Tennessee, United States; NASA Glenn Research Center, United States

P9306 *Impact of Non-Linear Commutation Delay on the Performance of Inductor Current Estimation Techniques [#18851]*
Rajat Channappanavar and Santanu Mishra, Indian Institute of Technology Kanpur, India

P9307 *ITER NBI DC-1MV Ultrahigh Voltage Rectifier [#18083]*
Akeshi Takahashi, Tanaka Toshiaki, Kohei Yamaguchi, Hiroyuki Fujita, Yuki Hiranuma, Satoshi Ichimura, Kazuhiro Watanabe, Mieko Kashiwagi, Tetsuya Maejima and Hiroyuki Tobari, Hitachi, Ltd., Japan; Quantum and Radiological Science and Technology, Japan

P9308 *Probability Analysis Of Switching Events In Power Electronic Converters [#18252]*
Shrivatsal Sharma, Jun Kikuchi, Alfredo Munoz, Elaine Yu and Mike Degner, Ford Motor Company, United States

P9309 *Analysis of Soft-Switching Performance for a DC-DC Dual Active Bridge Converter with Randomly Varying Loads [#18622]*
Jacob Mueller and Jonathan Kimball, Missouri University of Science and Technology, United States

Plenary Poster Session: Switched Reluctance, Flux Switching, Axial Flux Machines

Tuesday, September 25, 2:30PM-5:00PM, Room: Exhibit Hall A and A1, Chair: Hussain Hussain, Rakib Islam

P9501 *Torque Quality Improvement of an Open-End Winding PMSM [#19128]*
Nick Hunter, Tom Cox, Pericle Zanchetta and Shafiq Ahmed Odhano, The University Of Nottingham, United Kingdom

P9502 *A Study on the Axial Leakage Magnetic Flux According to the Rotor Structure in Spoke Type Permanent Magnet Synchronous Motor [#19333]*
Sung Gu Lee, Jaenam Bae and Won-ho Kim, Busan University of Foreign Studies, Korea (South); Dongyang mirae University, Korea (South); Gachon University, Korea (South)

P9503 *Analytical Methods for Spatially Varying MMF Vectors to Adjust Back-EMF Harmonics and Torque Ripple in Variable Magnetization Pattern Machines [#19186]*
Ryoko Imamura and Robert Lorenz, UW-Madison, WEMPEC, United States

P9504 *Hybrid Excitation Flux Switching Motor with Permanent Magnet Placed at Middle of Field Coil Slots Employing High Filling Factor Windings [#19465]*
Takashi Kosaka, Keisuke Isobe, Okada Takeshi and Nobuyuki Matsui, Nagoya Institute of Technology, Japan

P9505 *Design of a Permanent Magnet Vernier Generator for Bearing-less Wind Turbine System [#18640]*
Byungtaek Kim, Kunsan National University, Korea (South)

P9506 *Determination of Measurement Uncertainty of Direct and Indirect Efficiency Measurement Methods in Permanent Magnet Synchronous Machines [#19119]*
Nijan Yogal, Christian Lehrmann and Markus Henke, Physikalisch-Technische Bundesanstalt, Germany; Technical university Braunschweig, Germany

P9507 *Design and Performance Investigation of Novel Magnetless Linear Variable Flux Reluctance Machines [#18972]*
Yiming Shen, Zhejiang University, China

P9508 *Multi-physics FEA modeling of 6/10 Switched Reluctance Machine: An Electromagnetic Vibration Perspective [#18148]*
Selin Yaman, Yang Zhi and Krishnamurthy Mahesh, Illinois Institute of Technology, United States

P9509 *A Comparative Study on Nine- and Twelve-Phase Flux-Switching Permanent-Magnet Wind Generators [#18278]*
Lingyun Shao, Wei Hua, Feng Li, Juliette Soulard, Z. Q. Zhu, Zhongze Wu and Ming Cheng, EE, Southeast University, China; WMG, The University of Warwick, United Kingdom; EMD, The University of Sheffield, United Kingdom

P9510 *An Efficient Multi-Objective Bayesian Optimization Approach for Automated Analytical Design of Switched Reluctance Machines [#19548]*
Shen Zhang, Ronald G. Harley and Thomas G. Habetler, Georgia Institute of Technology, United States

P9511 *Visualization and Data Mining of Multi-Objective Electric Machine Optimizations with Self-Organizing Maps: A Case Study on Switched Reluctance Machines [#19507]*
Shen Zhang, Sufei Li, Ronald G. Harley and Thomas G. Habetler, Georgia Institute of Technology, United States

Plenary Poster Session: Materials, Losses, Thermal, Model and Analysis of Electrical Machine

Tuesday, September 25, 2:30PM-5:00PM, Room: Exhibit Hall A and A1, Chair: Gerd Bramerdorfer, Alejandro Pina Ortega

P9701 *Additive Manufacturing of High Performance Ferromagnetic Materials [#19163]*
Thang Pham and Shanelle Foster, Michigan State University, United States

P9702 *Load Capability of Multiphase Machines under Normal and Open-Phase Fault Conditions [#18604]*
Aldo Boglietti, Radu Bojoi, Sandro Rubino and Marco Cossale, Politecnico di Torino, Italy; BRUSA Elektronik AG, Switzerland

P9703 *An Accurate Iron Loss Analysis Method based on Finite Element Analysis considering Dynamic Anomalous Loss [#18674]*
Katsuyuki Narita, Hiroyuki Sano, Takashi Yamada, Ryosuke Akaki and Masahiro Aoyama, JSOL Corporation, Japan; SUZUKI Motor Corporation, Japan

P9704 *Estimation of PM Machine Efficiency Maps From Limited Data [#18855]*
Amin Mahmoudi, Kahourzade Solmaz, Soong Wen, Ertugrul Nesimi and Pellegrino Gianmario, Flinders University, Australia; The University of Adelaide, Australia; Politecnico di Torino, Italy

P9705 *A Combined Thermal Analysis of an Integrated Six-Phase Motor Drive System [#19410]*
Cong Wang, Dawei Li, Ronghai Qu, Xinggang Fan, Wubin Kong, Haiyang Fang, Zihan Gao and Peng Yan, Huazhong University of Scicence and Technology,, China

P9706 *Losses Analysis and Experiment of Fractional-Slot Concentrated-Winding Axial Flux PMSM for EV Applications [#18030]*
Qixu Chen, Deliang Liang and Shaofeng Jia, Xi'an Jiaotong University, China

P9707 *Comparative Analysis of the Efficiency of a Five-phase Permanent Magnet Assisted Synchronous Reluctance Motor under Double Phase Open Fault Conditions [#19650]*
Md Tawhid Bin Tarek, Akm Arafat and Choi Sungdeog, University of Akron, United States

P9708 *Improved Analytical Calculation of High Frequency Winding Losses in Planar Inductors [#18415]*
Xiaohui Wang, Li Wang, Ling Mao and Yaojia Zhang, Nanjing University of AeronauticsandAstronautics, China

P9709 *Iron loss measurements of non-oriented electrical steels at elevated magnetic polarization values: comparison of calorimetric and field-metric methods [#18922]*
Sigrid Jacobs, Lode Vandenbossche, Vinicius Araujo Rabello Landeira and Emmanuel Attrazic, ArcelorMittal, Belgium; Arcelormittal, Belgium

P9710 *Analytical Modelling of Helical Cooling Channels Embedded in Stator Laminations of Electric Machines [#18592]*
Chenjie Lin and Colin Tschida, ABB, United States

P9711 *Efficiency Improvement of a Double-Stator PM Vernier Machine for Direct-Drive Robotics [#18428]*
Jincheng Yu, Chunhua Liu and Yixiao Luo, City University of Hong Kong, Hong Kong

P9712 *Cogging Torque Suppression in Flux-Switching Permanent Magnet Machines by Superposition of Single Rotor Tooth [#18056]*
Xiaofeng Zhu and Wei Hua, Southeast University, China

P9713 *Design Method of Homopolar Inductor Alternator Based on 2-D Equivalent Model [#18710]*
Jiangtao Yang, Caiyong Ye, Wei Xu, Fei Xiong and Xin Liang, Huazhong University of Science and Technology, China

P9714 *Analytical Approach for Calculating Magnetic Field Distribution in Surface Mount PM Motor including Stator Slot Effect [#19580]*
Selin Yaman, Yong Jiang, Mohamad Salameh and Mahesh Krishnamurthy, Illinois Institute of Technology, United States

P9715 *Closed-Form Solution for the Slot Leakage Inductance of Tooth Coil Windings Permanent Magnet Machines [#18683]*
Werner Jara, Carlos Madariaga, Juan Tapia, Pia Lindh, Juha Pyrhonen and Javier Riedemann, Pontificia Universidad Catolica de Valparaiso, Chile; University of Concepcion, Chile; Lappeenranta University of Technology, Finland

P9716 *Analytical Sizing of Radial Flux Hybrid Excitation Synchronous Machines [#19428]*
Antonio Di Gioia, Ian P. Brown and Fabio Giulii Capponi, Illinois Institute of Technology, United States; University of Rome "La Sapienza", Italy

P9717 *Co-Simulation in Finite Element Analysis and Measurement of Flux Characteristics for Synchronous Machines [#19784]*
Omar Bottesi, Sandro Calligaro, Piyush Kumar, Luigi Alberti and Roberto Petrella, Free University of Bolzano, Italy; University of Padova, Italy; University of Udine, Italy

P9718 *Bar Winding AC Losses Evaluation for Traction Motor Application [#19415]*
Wen Ouyang and Bahar Anvari, Abb corporate research, United States

P9719 *Performance Evaluation of Electromagnetic and Circuit Co-Simulation for LLC DC-DC Converter [#18360]*
Kumpei Yoshikawa and Tetsuya Oshikata, Shindengen Electric Manufacturing Co., Ltd., Japan

Plenary Poster Session: High Speed and Bearingless Machines, Transportation Machines

Tuesday, September 25, 2:30PM-5:00PM, Room: Exhibit Hall A and A1, Chair: Alireza Fatemi, Athanasios Karlis

P9901 *Experimental Results Passing Through Critical Speeds of Radial and Tilting Motions in a One-Axis Actively Positioned Single-Drive Bearingless Motor [#18234]*
Hiroya Sugimoto and Akira Chiba, Tokyo Institute of Technology, Japan

P9902 *Analytical approach to compute additional losses\ in high speed motors with hairpin winding [#19024]*
Grazia Berardi and Nicola Bianchi, University of Padova, Italy

P9903 *Conformal Mapping in Bearingless Motor Design [#19493]*
Ye gu Kang and Eric Severson, UW-Madison, WEMPEC, United States

P9904 *Design and Control for Synchronous Permanent Magnet Motor Drive System with Series Capacitor [#18584]*
Hyeon-gyu Choi, Young-hyun Choi and Jung-Ik Ha, Seoul National University, Korea (South)

P9905 *Optimal Design of 50kW Concentrated Winding Bearingless Motor [#19496]*
Ye gu Kang and Eric Severson, UW-Madison, WEMPEC, United States

P9906 *Design of Five-phase Bearingless Permanent Magnet Assisted Synchronous Reluctance Motor for High Speed Applications [#19654]*
Md Zakirul Islam and Seungdeog Choi, University of Akron, United States

P9907 *Study of AC losses in electric sport racing traction application [#18966]*
Giuseppe Volpe, Mircea Popescu, Fabrizio Marignetti and James Goss, University of Cassino and Southern Lazio, Italy; Motor Design ltd., United Kingdom

P9908 *Modeling and Losses Analysis of 150 kW 30000 rpm Bearingless Surface Permanent Magnet Motor [#18891]*
Daria Kepsu, Rafal Jastrzebski and Olli Pyrhonen, Lappeenranta University of Technology, Finland

P9909 *A Consequent-Pole Five-Phase Fault-Tolerant Permanent-Magnet Synchronous Machine for Electric Vehicles [#18339]*
Yi Sui, Harbin Institute of Technology, China

P9910 *Scaling Study of High Frequency Machine for Electric Aircraft Propulsion [#19102]*
Andy Yoon and Kiruba Haran, University of Illinois at Urbana Champaign, United States

P9911 *Saliency-enhanced Spoke-type Rotor Geometry for Permanent Magnet Reduction in Hybrid and Electric Vehicle Motors [#19060]*
Giorgio Pietrini, Alessandro Soldati, Carlo Concari and Nicola Bianchi, University of Parma, Italy; University of Padova, Italy

P9912 *DC-link Voltage Design of Real-Time Motor Emulator for Interior Permanent-Magnet Synchronous Motors [#19550]*
Yoon-Ro Lee, Yong-Cheol Kwon and Seung-Ki Sul, Seoul National University, Korea (South)

P9913 *Influence of Key Parameters on Efficiency Map for a 3-Phase 48-Slot/8-Pole Permanent Magnet Synchronous Motor for Pure Electric Vehicles [#18173]*
Zhongze Wu, Soulard Juliette, Z. Q. Zhu, Lingyun Shao, Will Loder, Steve Heinrich and David Greenwood, WMG, The University of Warwick, United Kingdom; EMD, The University of Sheffield, United Kingdom; EE, Southeast University, China

Plenary Poster Session: Induction, Sync-Rel and SR Machine Drives

Tuesday, September 25, 2:30PM-5:00PM, Room: Exhibit Hall A and A1, Chair: David Diaz Reigosa, Luca Zarri

P10101 *A Saturation Model of the Synchronous Reluctance Motor and its Identification by Genetic Algorithms [#18478]*
Angelo Accetta, Maurizio Cirrincione, Marcello Pucci and Antonino Sferlazza, ISSIA-CNR, Italy; University of the South Pacific (USP), Fiji; University of Palermo, Italy

P10102 *A Space-vector State Dynamic Model of the Synchronous Reluctance Motor Including Self and Cross-Saturation Effects and its Parameters Estimation [#18479]*
Angelo Accetta, Maurizio Cirrincione, Marcello Pucci and Antonino Sferlazza, ISSIA-CNR, Italy; University of the South Pacific (USP), Fiji; University of Palermo, Italy

P10103 *Switched Brushless Doubly-Fed Reluctance Machine Drive for Wide-Speed Range Applications [#18794]*
Shivang Agrawal and Arijit Banerjee, University of Illinois Urbana Champaign, United States

P10104 *A Novel Converter Control Strategy For a DFIM-based Pumped Storage System in an Islanded Microgrid under Fault Conditions [#18525]*
Zijun Chen, Pinjia Zhang and Weizhi Hu, Tsinghua University, China; Northeast Electric Power University, China

P10105 *Restart Strategy for Synchronous Reluctance Machine Driving a High Inertia Load [#18541]*
Kibok Lee, Sara Ahmed and Srdjan Lukic, North Carolina State University, United States; ABB, United States

P10106 *Small-Signal Modeling and Speed Controller design for Switched Reluctance Motor Drives [#18626]*
Qingqing Ma and El-refaie Ayman, Marquette University, United States

P10107 *New Control Scheme for Unbalanced Stand-alone BDFIG-based Ship Shaft Generation System Using Dead Beat Control Method [#18705]*
Jianping Gao, Wei Xu, Yi Liu and Kailiang Yu, State Key Laboratory of Advanced Electromagnetic, China

P10108 *A Novel Dual Output Buck-Boost DC-DC Converter for Solar PV Energized SRM Driven Irrigation Pump [#18440]*
Anjanee Kumar Mishra and Bhim Singh, IIT DELHI, India

P10109 *Anti-Disturbance Model Predictive Torque Control of High-Altitude Ventilator Induction Machine with Extend MTPA Operation [#18779]*
Liming Yan, Manfeng Dou and Zhiguang Hua, Northwestern Polytechnical University, China

P10110 *DC-link Current Sensor Extension for Dead-Beat Direct Torque and Flux Control of Non-Salient Electric Machines [#18796]*
Tomas Sadilek and Robert Lorenz, GE Global Research, United States; WEMPEC - University of Wisconsin, Madison, United States

P10111 *A Multi-Pulse AC-DC Converter Fed Multi-Level Inverter For Power Quality Improvement In VCIMD [#18654]*
Bhim Singh and Piyush Kant, Indian Institute of Technology Delhi, India

P10112 *Power Factor Improvement Control Strategy for Six-Phase DC-Biased Vernier Reluctance Machines Based on Three-Dimensional Current Distribution [#18159]*
Zixiang Yu, Wubin Kong, Li Dawei and Qu Ronghai, Huazhong university of science and technology, China

P10113 *Wind Energy Conversion System based on DFIG with three-phase Series Active Filter without Transformer [#19231]*
Italo Andre Cavalcanti de Oliveira, Cursino Brandao Jacobina and Nady Rocha, UFCG, Brazil; UFPB, Brazil

P10114 *Improved Model Predictive Control Method for Two Induction Motor Fed by Five-leg Inverter System [#19337]*
Young-Seol Lim, June-Seok Lee and Kyo-Beum Lee, Ajou University, Korea (South); Korea Railroad Research Institute, Korea (South)

P10115 *Extended Speed Current Profiling Algorithm for Low Ripple SRM using Model Predictive Controller [#19635]*
Siddharth Mehta, Md Ashfanoor Kabir and Iqbal Husain, North Carolina State University, United States; ABB US Corporate Research Center, United States

Plenary Poster Session: Assorted issues in electric drives

Tuesday, September 25, 2:30PM-5:00PM, Room: Exhibit Hall A and A1, Chair: David Diaz Reigosa, Luca Zarri

P10301 *Scaling Gain Compensation Method for Current Measurement of Motor Drive Applications under Locked-rotor Condition Considering Inequality of Each phase Resistances [#18641]*
Minsik Yoo and Young-Doo Yoon, Hanyang University, Korea, Republic of

P10302 *An Electrostatic Synchronous Machine Drive Utilizing Step Up Transformers [#18785]*
Aditya Ghule and Daniel Ludois, University of Wisconsin - Madison, United States

P10303 *Interaction between Micro-Grid Generators and Active Front End Converters: Modeling, Analysis and Solutions [#19248]*
Zhijun Liu and Gary Skibinski, Rockwell Automation, United States

P10304 *Dyne-less Test Method for Adjustable Speed Drive [#18537]*
Yogesh Patel and Lixiang Wei, Rockwell Automation, United States

P10305 *A Variable Power Factor High Power Testbed for Traction Inverter Using Back-to-Back Connection [#18358]*
Yukun Luo, Li Yang, Juhamatti Korhonen, Wensong Yu and Iqbal Husain, North Carolina State University, United States; Lappeenranta University of Technology, Finland

P10306 *Deriving State Block Diagrams that Correctly Model Hand-Code Implementation - Correcting the Enhanced Luenberger Style Motion Observer as an Example [#18433]*
Caleb Secrest, David Ochs and Brent Gagas, General Motors, United States

P10307 *Design Considerations of Electromechanical Actuation System for More Electric Aircraft (MEA) [#18663]*
Shaohong Zhu, Tom Cox, Xu Zeyuan and Chris Gerada, University of Nottingham, United Kingdom

P10308 *A Novel 4-IN-1 Variable Frequency Drive Topology [#18455]*
Mahesh Swamy, Yaskawa America, Inc., United States

P10309 *Effect of position measurement delay on the performance of electrical machines [#19612]*
Anant Singh, Tomy Sebastian, Ramakrishnan Raja and Abraham Gebregergis, Halla Mechatronics, United States

P10310 *Dynamic DC-Link Over-Voltage Mitigation Method in Electrolytic Capacitor-less Adjustable Speed Drive Systems [#18706]*
Zhentian Qian, Wenxi Yao and Kevin Lee, Zhejiang University, China; Eaton Corporation, United States

Plenary Poster Session: Converter design 2

Tuesday, September 25, 2:30PM-5:00PM, Room: Exhibit Hall A and A1, Chair: Drazen Dujic, Jelena Popovic

P10501 *Active Variable Gate Drive for Suppressing IGBT Collector Current Overshoot [#18384]*
Yan Pan, Rui Wang, Lin Liang, Jinyuan Li, Lubin Han, Guoqiang Tan and Yu Chen, Global Energy Interconnection Research Institute, China; Huazhong University of Science and Technology, China

P10502 *Analysis on the parasitic inductance of commutation loop corresponding to different cathode regions in GCT wafer [#18456]*
Jiapeng Liu, Rong Zeng, Gang Lyu, Wenpeng Zhou and Chaoqun Xu, Tsinghua University, China

P10503 *Determining the minimal decoupling capacitor in a high speed switching cell using optimization [#18502]*
Andressa Nakahata Medrado, Jean-Luc Schanen, Pierre-Olivier Jeannin, Jean-Michel Guichon and Guillaume Desportes, G2Elab - Alstom Group, France; Univ. Grenoble Alpes, CNRS, Grenoble INP, G2Elab, France; Alstom Group, France

P10504 *A Gate Driver based Approach to Improving the Current Density in a Power Module by Equalizing the Individual Die Temperatures [#18624]*
Jeffrey Ewanchuk, Julio Brandelero and Stefan Mollov, Mitsubishi Electric Research Centre Europe, France

P10505 *Integrated motor-inverter power module for electric compressor (e-Compressor) in 48V mild hybrid vehicles [#18856]*
Jihwan Seong, Sangwon Yoon, Jangmook Lim, Min-ki Kim, Jaejin Jeon, Semin Park, Hyunkyu Choi, Yucheol Park, Pilkyoung Oh, Sang Min Kim and Taesuk Kwon, Hanyang University, Korea, Republic of; Hyundai Mobis Co., Ltd., Korea, Republic of

P10506 *Comparative Evaluation of Kelvin Connection for Current Sharing of Multi-Chip Power Modules [#19581]*
Zheng Zeng, Xiaoling Li, Lin Cao, Xin Zhang, Yue Yu and Jin Wang, Chongqing University, China; CRRC Yongji Electric Co., Ltd., China; Nanyang Technological University, Singapore

P10507 *EMI Analysis and Optimal Layout of Full-SiC MOSFET Integrated Power Module [#19672]*
Xiliang Chen, Xi'an Jiaotong University, China

P10508 *Analysis on Ultra-fast Switching of 1.2kV SiC MOSFETs for Megahertz Applications enabled by 3D package [#19698]*
Xin Zhao and Alex Q. Huang, University of Texas at Austin, United States

P10509 *Current Sharing in a Compact, Low Inductance 900 V, 5 mOhm SiC Half-Bridge Power Module [#19781]*
Amy Romero, Grace Watt and Rolando Burgos, CPES (Virginia Tech), United States

P10510 *Test fixture to measure the saturation characteristics of coupled multi-winding inductor [#19489]*
Marzieh Karami, Rangarajan Tallam and Xuechao Wang, Rockwell Automation, United States

P10511 *Calorimetric power-loss measurement of a high-power film capacitor with actual ripple current generated by a PWM inverter [#19604]*
Kazunori Hasegawa and Ichiro Omura, Kyushu Institute of Technology, Japan

P10512 *Electro-thermal Limited Switching Frequency for Parallel Diodes [#18427]*
Xiaoling Li, Huaping Jiang, Li Ran, Zheng Zeng and Borong Hu, Chongqing University, China; Dynex Semiconductor Ltd, United Kingdom; Chongqing University; The University of Warwick, China

P10513 *Thermal Monitoring of Power Electronic Modules via Adaptive Observers [#18821]*
Christoph H. van der Broeck, Robert D. Lorenz and Rik W. De Doncker, ISEA, RWTH Aachen University, Germany; WEMPEC, UW Madison, United States

Plenary Poster Session: LED Lighting

Tuesday, September 25, 2:30PM-5:00PM, Room: Exhibit Hall A and A1, Chair: Marcos Alonso, Henry Chung

P10701 *A Multi-Output AC/DC Converter for LED Grow Lights [#19753]*
Rahil Samani, Dawood Shekari and Majid Pahlevani, University of Calgary, Canada

P10702 *Analysis and Design of a Modular Multi-channel Constant-current LED driver Based on High Frequency AC Square Voltage Bus [#18207]*
Qingqing He, Quanming Luo, Chi Cao, Pengju Sun and Luowei Zhou, Chongqing University, China

P10703 *High-Efficiency Multiple-String Linear LED Driver with Genetic Algorithm for Low Power Application [#18031]*
Xiaofeng Lyu and Na Ren, North Dakota State University, United States; University of California, Los Angeles, United States

P10704 *A Remotely Control Dimming System for LED lamps with Power Factor Correction [#18752]*
Radwa Abdalaal and Carl Ngai Man Ho, University of Manitoba, Canada

P10705 *An Input-Adaptive Multi-Segmented LED Driver for Wide AC Input Applications [#18110]*
Yi Chen, Degang Zhong and Yurong Nan, Zhejiang University of Technology, China

P10706 *Design a Modified Bi-directional Converter for Solar LED Lighting System [#18889]*
Yiwang Wang, Bo Zhang, Houjun Tang, Jian Ni and Xiaogao Chen, Shanghai Jiaotong University, China; Suzhou Vocational University, China; suzhou PurpleRubik New Enery Technology Co.,Ltd, China; wuxi solartale solar pv Technology Co.,Ltd, China

P10707 *A Low Cost AC Direct LED Driver with Reduced Flicker using Triac [#19377]*
Yongjun Li, Jaeduk Han and Seth Sander, UC Berkeley, United States

P10708 *A 14-W 92%-Efficient Hybrid DC-DC Converter with Advanced Bootstrap Gate Drivers for Smart Home LED Applications [#19508]*
Loan Pham-Nguyen, Hanh-Phuc Le, Van-Quyet Nguyen, Duc-Manh Nguyen, Huy-Dung Han and Kim-Hoang Nguyen, Hanoi University of Science and Technology, Viet Nam; University of Colorado Boulder, United States, United States

Wednesday, September 26, 8:30AM-10:10AM

Solar PV Converters I

Wednesday, September 26, 8:30AM-10:10AM, Room: A107, Chair: Sudip Mazumder, Raghav Khanna

8:30AM *Comparison of Secondary Topology of an LLC Converter for Photovoltaic Application [#19217]*
Jinghui Yan, Xiaonan Zhao, Cheng-wei Chen and Jih-Sheng (Jason) Lai, Virginia Tech Future Energy Electronic Center, United States

8:55AM *A High-Performance Cost-Effective Resonant Converter with a Wide Input Range in Solar Power Applications [#19307]*
Fariborz Musavi, Washington State University, United States

9:20AM *An Extremely Low-Cost Multi-Panel PV Emulator for Research and Education [#19361]*
Sanchit Mishra, Siddharth Raju, Abhijit Kshirsagar and Ned Mohan, University of Minnesota, United States

9:45AM *Transformerless Three Phase NPC Inverter With Reduced Switches [#19441]*
Liwei Zhou and Matthias Preindl, Columbia University, United States

Microgrid Control-III

Wednesday, September 26, 8:30AM-10:10AM, Room: B117, Chair: Afshin Izadian, Ke Ma

8:30AM *A Droop Based Controller for Super-capacitor to Compensate the Transient Current and Pulsed Load in DC Microgrid [#18765]*
Duy-Hung Dam, Song-Jin Choi and Hong-Hee Lee, University of Ulsan, Korea (South)

8:55AM *Site-Specific Evaluation of Microgrid Controller Using Controller and Power Hardware-in-the-Loop [#19059]*
Prabakar Kumaraguru, Wang Jing, Pratt Annabelle, Miller Brian, Fossum John, Bialek Tom, Symko-Davies Martha and Usman Muhammad Usama, Research Engineer, United States; Principal ENgineer, United States; Manager, United States; Student Intern, United States

9:20AM *Slim DC-Link Three-phase PWM Converter with Full Symmetrical Sequence Current Capability for Rebalancing the Grid Voltage in Weak LV Networks [#18873]*
Markus Holbein, Technical University of Darmstadt, Germany

9:45AM *Distributed Coordinated Control of AC/DC Microgrid Voltage Containing Electric Vehicles [#19444]*
Meiqin Mao, Yufeng Liu, Yangyang Wang, Liuchen Chang and Nikos Hatziargyriou, Hefei University of Technology, China; University of New Brunswick, Canada; National Technical University Of Athens, Greece

Electric Drive-trains

Wednesday, September 26, 8:30AM-10:10AM, Room: C120, Chair: Jae-Do Park, Bulent Sarlioglu

8:30AM *A Restart Strategy of a Rotating Induction Machine for Eliminating Current Surge [#18527]*
Liangju Tao, Jian Li, Ronghai Qu, Junhua Chen and Kun He, Huazhong University of Science and Technology, China

8:55AM *A High-efficiency High-power Density Modular DC-DC Converter for Hall Effect Thruster Electric Propulsion Aerospace Application Using GaN Device [#19032]*
Xiaohu Liu and Eric Ehrbar, Busek, United States

9:20AM *Busbar Design For Distributed dc-Link Capacitor Banks For Traction Applications [#19388]*
Rana Alizadeh, Tyler Adamson, Shanshan Long, Chirag Rajan, Marcelo Schupbach, Juan Carlos Balda, Yue Zhao, Mehdi Asheghi and Kenneth E Goodson, University of Arkansas, United States; Stanford University, United States

9:45AM *Development and Optimization of a Hybrid Coupled Inductor Pair for High Power and High Density Multi-phase DC-DC Converters [#19546]*
Yu Du, ABB Inc., United States

Multi-level converters 3

Wednesday, September 26, 8:30AM-10:10AM, Room: B119, Chair: Jorge Garcia, Milijana Odavic

8:30AM *Model Predictive Circulating Current Regulator for Single-Phase Modular Multilevel Converter [#19123]*
Joan-Marc Rodriguez-Bernuz and Adria Junyent-Ferre, PhD Student, United Kingdom; Lecturer, United Kingdom

8:55AM *Hybrid Modular Multilevel Converter Configurations for Low-Frequency Operation [#18539]*
Qichen Yang and Maryam Saeedifard, Georgia Institute of Technology, United States

9:20AM *IGCT-based Direct AC/AC Modular Multilevel Converters for Hydro Pumped Storage [#18768]*
Michail Vasiladiotis, Remo Baumann and Juergen Steinke, ABB Switzerland Ltd., Switzerland

9:45AM *Integrating Phase-Shifted Pulse-Width Modulation to Model Predictive Current Control of Modular Multilevel Converters [#18085]*
Dehong Zhou, Shunfeng Yang and Yi Tang, Nanyang Technological University, Singapore

DC-DC non-isolated 3

Wednesday, September 26, 8:30AM-10:10AM, Room: C122, Chair: Maurizio Cirrincione, Mahshid Amirabadi

8:30AM *A Modular Cascaded Multilevel Buck Converter Based on GaN Devices Designed for High Power Envelope Elimination and Restoration Applications [#18409]*
Chao Wang, Peiwen Xing, Liang Zhang, Kui Wang and Yongdong Li, Tsinghua University, China; Beijing Shengfeifan Electronic System Technology, China

8:55AM *A Low Current Ripple High Step-Up Coupled Inductor DC-DC Converter Utilizing an Improved Voltage-Multiplier Cell for PV Applications [#18188]*
Abdulhakeem Alsaleem and Marcelo Simoes, Colorado School of Mines, United States

9:20AM *A Burst Mode Control Method for Phase-Shift Controlled Switched-Capacitor-based Resonant Converters [#18903]*
Hadi Setiadi and Hideaki Fujita, Tokyo Institute of Technology, Japan

9:45AM *Interleaved/Stacked Multi-Module Boost Converter-Based Pulse Generators for Resistive loads [#18067]*
Ahmed Elserougi, Ahmed Massoud and Shehab Ahmed, Qatar University, Qatar; Texas A and M University at Qatar, Qatar

Modeling and Control of Grid Connected Converter 1

Wednesday, September 26, 8:30AM-10:10AM, Room: B116, Chair: Yunwei (Ryan) Li, Karthik Kandasamy

8:30AM *Robust AC Voltage Controller With Harmonic Elimination for Stand-Alone and Weak-Grid-Connected Operation [#18751]*
Diego Perez-Estevez, Jesus Doval-Gandoy and Josep Guerrero, University of Vigo, Spain; Aalborg University, Denmark

8:55AM *A Voltage Sensorless Control of a Three Phase Grid Connected Inverter based on Lyapunov Energy Function under Unbalanced Grid Voltage Condition [#18094]*
Vikram Roy Chowdhury and Jonathan Kimball, Missouri University of Science and Technology, United States

9:20AM *Variable Switching Frequency PWM for Three-Level Grid-Connected Inverters with LCL Filters [#18163]*
Xuan Zhao, Jianan Chen and Dong Jiang, Huazhong University of Science and Technology, China

9:45AM *Complete Decentralized Control of Series AC-Cascaded VSCs as Virtual Kuramoto Oscillators [#18614]*
M a Awal, Iqbal Husain and Wensong Yu, North Carolina State University, United States

Stability in Power Converters 2

Wednesday, September 26, 8:30AM-10:10AM, Room: C121, Chair: Xiongfei Wang, Samir Kouro

8:30AM *Discrete-time Modeling and Stability Analysis of Peak-Current-Mode Controlled Buck Converter with Constant Current Load [#18373]*
Shuhan Zhou, Guohua Zhou, Jianping Xu, Taiqiang Cao, Yanyan Jin and Ping Yang, Southwest Jiaotong University, China; Xihua University, China; Chengdu Industry and Trade College, China

8:55AM *Impedance Modeling and Stability Analysis of a Dual-Active Bridge Converter-Based DC Distribution Grid [#19195]*
Jingxin Hu, Zheng An, Shenghui Cui, Nurhan Rizqy Averous and Rik W. De Doncker, PGS, E.ON Energy Research Center, RWTH Aachen, Germany; CDE, Georgia Institute of Technology, United States

9:20AM *Active damping of LCL filters with all-pass filters considering grid impedance variations and parameter drifts [#19480]*
Wenli Yao, Yongheng Yang, Yan Xu and Frede Blaabjerg, Nanyang Technological University, Singapore; Aalborg University, Denmark

9:45AM *Harmonic Suppression and Stability Enhancement for Grid-Connected Inverter Based on UPQC [#18955]*
Zhaohui Ni, Qiang Qian, Shaojun Xie, Jinming Xu and Bo Zeng, Nanjing University of Aero. and Astronautics, China

Modeling and Control of DC-AC Converters 2

Wednesday, September 26, 8:30AM-10:10AM, Room: A108, Chair: Jian Sun, Feng Gao

8:30AM *Disturbance Predictive Control of the LC Coupled Voltage Source Inverter [#18775]*
Lucas Koleff, Bruno Angelico, Eduardo Pellini and Lourenco Matakas, University of Sao Paulo, Brazil

8:55AM *Digital Variable Frequency control of a Single-Phase Energy-buffered Inverter with Multiple Modulation Strategies [#19199]*
Regina Ramos, Diego Serrano, Jesus A. Oliver, Pedro Alou and Jose A. Cobos, Universidad Politecnica de Madrid, Spain

9:20AM *ZVS Turn-on Triangular Current Mode (TCM) Control for Three Phase 2-Level Inverters with Reactive Power Control [#19322]*
Nidhi Haryani, BIngyao Sun and Rolando Burgos, CPES, Virginia Tech., United States

9:45AM *DC Bus Regulation in Cascaded Three Phase AC Power Converters with only Decoupling Capacitors [#19499]*
Mahima Gupta and Giri Venkataramanan, University of Wisconsin - Madison, United States

Modelling and Analysis Methods 1

Wednesday, September 26, 8:30AM-10:10AM, Room: B112, Chair: Vandana Rallabandi, Mohammad Rasouli

8:30AM *Estimation of PWM-Induced Iron Loss in IPM Machines Incorporating the Impact of Flux Ripple Waveshape and Nonlinear Magnetic Characteristics [#18670]*
Le Chang, Thomas Jahns and Rolf Blissenbach, University of Wisconsin - Madison, United States; General Motors Global Propulsion Systems, United States

8:55AM *Theoretical and Experimental Investigation of the Brushless Doubly-Fed Machine with a Multiple-Barrier Rotor [#19172]*
Peng Han, Julia Zhang and Ming Cheng, The Ohio State University, United States; Southeast University, China

9:20AM *A Mission Profile Emulator for Permanent Magnet Synchronous Machine Drive System Based on Single-phase H-bridge Circuit [#18702]*
Yubo Song, Ran Cheng and Ke Ma, Shanghai Jiao Tong University, China

9:45AM *Impact of Airgap on the Performance of 3-Phase Permanent Magnet Hybrid Stepper Motors [#18704]*
Murat Onsal, Yucel Demir, Mustafa K. Guven and Metin Aydin, MDS Motor Design Ltd., Turkey; Schlumberger, United States; Kocaeli University, Turkey

Magnetic Gears and Low Speed Machines

Wednesday, September 26, 8:30AM-10:10AM, Room: B118, Chair: Siavash Pakdelian, Jonathan Bird

8:30AM *Design and Testing of a Hermetically Sealed Magnetic Gearbox for a Marine Hydrokinetic Generator [#19526]*
Hossein Baninajar, Sina Modaresahmadi, Jonathan Bird and Wesley Williams, Portland State University, United States; University of North Carolina at Charlotte, United States

8:55AM *A Magnetically Geared Lead Screw without Translator Skewing [#19067]*
Mojtaba Bahrami Kouhshahi, Jonathan Bird, Joshua Kadel, Wesley Williams and Andrew Jannsen, Portland State University, United States; University of North Carolina at Charlotte, United States

9:20AM *Controlled Backdrivability of Radial-Gap Magnetic-Screw Type RotLin Actuator [#19038]*
Christophe Cyusa and Yasutaka Fujimoto, Yokohama National University, Japan

9:45AM *Comparison of Surface Permanent Magnet Coaxial and Cycloidal Radial Flux Magnetic Gears [#19020]*
Matthew Gardner, Matthew Johnson and Hamid Toliyat, Texas A and M University, United States; Toshiba International Corporation, United States

Estimation Techniques for Electric Drives

Wednesday, September 26, 8:30AM-10:10AM, Room: B110, Chair: Mazharul Chowdhury, Giacomo Scelba

8:30AM *Real-time Parameter Estimation in Back-EMF Self-Sensing Mode with the Synergy of Induction Machine Deadbeat-Direct Torque and Flux Control Drives [#19174]*
Kang Wang, Noor Baloch and Robert Lorenz, University of Wisconsin-Madison, United States; Yaskawa Electric Corporation, Japan

8:55AM *Temperature Estimation of Field-Oriented Control Induction-Motor Based on DC-Current Injection Suitable for Low Inertia [#18743]*
Fernando Baneira, Lucian Asiminoaei, Jesus Doval-Gandoy, Hernan Miranda, Alejandro Yepes and Jens Godbersen, University of Vigo, Spain; Danfoss Drives A/S, Denmark

9:20AM *Magnet Temperature Estimation in Permanent Magnet Synchronous Machines Using the High Frequency Inductance [#18473]*
David Reigosa, Daniel Fernandez, Maria Martinez, Juan Manuel Guerrero, ALberto B. Diez and Fernando Briz, University of Oviedo, Spain

9:45AM *Online Parameter Estimation of a Brushless Synchronous Starter/Generator with Signal Injection [#18259]*
Shuai Mao, Weiguo Liu, Ningfei Jiao, Jichang Peng and Zan Zhang, Northwestern Polytechnical University, China

Predictive Control of Electric Drives

Wednesday, September 26, 8:30AM-10:10AM, Room: B113, Chair: Michael Harke, Yue Zhao

8:30AM *Multi-Step Model Predictive Control for a High-Speed Medium-Power PMSM [#19069]*
Stefan Walz, Radu Lazar and Marco Liserre, Christian-Albrechts-University Kiel, Germany; Danfoss Drives A/S, Denmark

8:55AM *Model Predictive Pulse Pattern Control for Medium-Voltage Drives [#19126]*
Tobias Geyer, Vedrana Spudic, Wim van der Merwe and Ester Guidi, ABB Switzerland, Switzerland

9:20AM *A Simple Method to Compensate Steady State Errors in the Deadbeat Predictive Control of the PMSM [#18998]*
Cheng Xu and Shuai Lu, Chongqing University, China

9:45AM *A New Deadbeat Model Predictive Control of Induction Motor Drives without Speed Sensor [#19363]*
Yongchang Zhang, Boyue Zhang and Yuning Bai, North China University of Technology, China

Thermal management in power converters

Wednesday, September 26, 8:30AM-10:10AM, Room: A105, Chair: Francesco Iannuzzo, Juan Sabate

8:30AM *Thermal Characterization of Power Semiconductors with H-bridge Testing Circuit [#18634]*
Ye Zhu and Ke Ma, Shanghai Jiao Tong University, China

8:55AM *Comparison of cooling solutions to improve surge loading capability of power semiconductor devices [#19117]*
Rostan Rodrigues, Taosha Jiang and Debrup Das, ABB Inc, United States

9:20AM *Thermal Comparison of Planar versus Conventional Transformers used in LLC Resonant Converters [#19524]*
Rouhollah Shafaei, Mohammad Ali Saket and Martin Ordonez, The University of British Columbia (UBC), Canada

9:45AM *Analytical Thermal Modeling of PCB Vias and Pads [#19325]*
Yanfeng Shen, Huai Wang and Frede Blaabjerg, Aalborg University, Denmark

LED Drivers

Wednesday, September 26, 8:30AM-10:10AM, Room: B111, Chair: Marco Dalla Costa, Xiaofeng Lyu

8:30AM *A Novel Color Control Method for Multi-Color LED Systems to Achieve High Color Rendering Indexes [#18243]*
Xiaoqing Zhan, Wenguan Wang and Henry Shu-hung Chung, City University of Hong Kong, Hong Kong

8:55AM *An Electrolytic Capacitor-less AC/DC LED Driver with a Low Power Processing Auxiliary Circuit and Ceramic Capacitors for Ripple Power Decoupling [#18848]*
Zhenyu Shan, Xiaomei Chen, Shengwen Fan, Juri Jatskevich and Chi K. Tse, North China University of Technology, China; University of British Columbia, Canada; Hong Kong Polytechnic University, Hong Kong

9:20AM *LED Driver Achieves Electrolytic Capacitor-Less and Flicker-Free Operation with an Energy Buffer Unit [#19305]*
Peng Fang, Bo Sheng, Yan Zhang and Yan-Fei Liu, Queen's University, Canada; Xi'An Jiao Tong University, China

9:45AM *Parallel Energy Buffering LED Driver Achieves Electrolytic Capacitor-less and Flicker-free Operation [#19316]*
Peng Fang, Bo Sheng, Wen-Bo Liu, Yan-Fei Liu and Paresh C Sen, Queen's University, Canada

Workshop: Power Electronics For Sustainable Energy Systems and Energy Sustainability
Wednesday, September 26, 8:30AM-10:10AM, Room: B114, Chair: Sudip Mazumder

Workshop: Trends in SiC, GaN, and diamond power semiconductor devices
Wednesday, September 26, 8:30AM-10:10AM, Room: B115, Chair: Tanya Gachovska

Wednesday, September 26, 10:30AM-12:10PM

Energy Storage Systems
Wednesday, September 26, 10:30AM-12:10PM, Room: A107, Chair: Adel Nasiri, Rakesh Mitra

10:30AM *Analysis of Standalone Household Power Systems [#18806]*
Brett Donnellan, Wen Soong and David Vowles, The University of Adelaide, Australia

10:55AM *Applied Adaptive Droop Control to Battery Energy Storage Operation [#19050]*
Yongzheng Zhang, AESO, Canada

11:20AM *Voltage Equalization Scheme for Onboard Supercapacitor Based on Sliding Mode Observer [#19381]*
Cao Hongwei Cao, Liu JianFeng Liu, Zhou Zhouyan Hui, Lv ChengZhang Lv, Li Heng Li and Huang Zhiwu Huang, Central South University, China

11:45AM *Efficiency Analysis and Optimization Method For the Energy Stored qZSI System [#19446]*
Yujie Wang, Sideng Hu, Zipeng Liang and Xiangning He, zhejiang University, China; Zhejiang University, China

Microgrid Control-IV
Wednesday, September 26, 10:30AM-12:10PM, Room: B117, Chair: Grahame Holmes, Ke Ma

10:30AM *Consensus-based Cooperative Droop Control for Accurate Reactive Power Sharing in Islanded AC Microgrid [#19434]*
Jiuyang Zhou, Meng-jiang Tsai and Po-tai Cheng, National Tsing Hua University, Taiwan

10:55AM *A Controller for Microgrid with Dynamic Boundary [#19442]*
Yiwei Ma, Lin Zhu, He Yin, Xiaotong Hu, Fred Wang and Leon Tolbert, University of Tennessee, United States

11:20AM *Impact of Communication Delay on Centrally Controlled DC Microgrid Performance during Islanding [#19519]*
Mahmoud Saleh, Yusef Esa and Ahmed Mohamed, The City College of New York, United States

11:45AM *High Quality Voltage Regulation of Single Phase Autonomous Microgrids under Nonlinear Load Conditions [#19703]*
Afif Nazib, Donald Grahame Holmes and Brendan Peter McGrath, RMIT University, Australia

Modular Multilevel Converters

Wednesday, September 26, 10:30AM-12:10PM, Room: B111, Chair: Suman Debnath, Jiangchao Qin

10:30AM *Synthetic-Inertia-based Modular Multilevel Converter Frequency Control for Improved Micro-grid Frequency Regulation [#18125]*
Yang Shunfeng, Fang Jingyang, Tang Yi and Wang Peng, Nanyang Technological University, Singapore

10:55AM *Triangular Current Mode For High Step Ratio Modular Multilevel DC-DC Converter [#18420]*
Cristian Pineda, Javier Pereda, Xiaotian Zhang and Felix Rojas, Pontificia Universidad Catolica de Chile, Chile; Xian Jiaotong University, China; University of Santiago of Chile, Chile

11:20AM *Thermal Analysis of Modular Multilevel Converters Under Subsynchronous Oscillation [#19511]*
Yongxia Liu, Yufei Dong, Wuhua Li and Xiangning He, Zhejiang University, China

11:45AM *Real-Time Simulation of Modular Multilevel Converters [#19741]*
Suman Debnath, Oak Ridge National Laboratory, United States

Applications of electric propulsion

Wednesday, September 26, 10:30AM-12:10PM, Room: C120, Chair: Suresh Gopalakrishnan, Wen Ouyang

10:30AM *Robust Predictive Control of 3L-NPC Converter Fed PMSM Drives for Electrical Car Applications [#19044]*
Zhenbin Zhang, Shandong University, China

10:55AM *Weight Minimization of LCL Filters for Aircraft Variable Frequency Starter/Generator System Based on Simplified Constraints Multi-Objective Models [#19261]*
Zhao Dan, Shen Ke and Liu Weiguo, Northwestern Polytechnical University, China

11:20AM *Multi-Domain Design Optimization of dv/dt Filter for SiC-based Three-Phase Inverter in High-Frequency Motor-Drive Applications [#19751]*
Jiangbiao He, Cong Li, Anoop Jassal, Naveenan Thiagarajan, Yichao Zhang, Satish Prabhakaran, Carlos Feliz, James Graham and Xiaosong Kang, GE Global Research, United States

11:45AM *Comparison of electrical machine types for electrically driven engine accessories using multiphysics simulation tools [#19773]*
Lavanya Vadamodala, Shuvajit Das, Omer Gundogmus, Tausif Husain, Salman Harasis, Sifat Chowdhury, Yilmaz Sozer, Fernando Venegas and David Colavincenzo, University of Akron, United States; Bendix CVS, United States

Multi-level converters 4

Wednesday, September 26, 10:30AM-12:10PM, Room: B119, Chair: Vito Giuseppe Monopoli, Koji Orikawa

10:30AM *A New Seven-Level Topology for High-Power Medium-Voltage Application [#18551]*
Guo Chen and Mehdi Narimani, McMaster University, Canada

10:55AM *A Novel PWM Strategy for SiC Three-Level Active Neutral Point Clamped Converter [#19666]*
Jiangbiao He, Di Zhang and Di Pan, GE Global Research, United States

11:20AM *Isolated Multilevel Single-Phase Converter with Two DC-links [#19194]*
Nayara Brandao de Freitas and Cursino Brandao Jacobina, Federal University of Campina Grande, Brazil

11:45AM *Cascaded Transformer Multilevel Inverters with Asymmetrical Turns Ratios Based on NPC [#18746]*
Filipe Bahia, Cursino Jacobina, Nady Rocha and Reuben Palmer, Federal University of Campina Grande (UFCG), Brazil; Federal University of the Paraiba (UFPB), Brazil

DC-DC Converters

Wednesday, September 26, 10:30AM-12:10PM, Room: C122, Chair: Hanh-Phuc Le, Ignacio Castro

10:30AM *Novel Transformer-less DAB Converters for the Regulated First-Stage of a Two-Stage 48V VRM [#18560]*
Somnath Khatua, Debaprasad Kastha and Santanu Kapat, Indian Institute of Technology Kharagpur, India

10:55AM *A High-Power-Density High-Efficiency Three-Level Buck Converter for Cellphone Battery Charging Applications [#19106]*
Yushi Liu, Ashish Kumar, Dragan Maksimovic and Khurram Afridi, University of Colorado Boulder, United States

11:20AM *A Comprehensive Comparison of MHz GaN-Based ZVS Step-Down Converters for Low Power Integrated on-Chip Applications [#19299]*
Xiaonan Zhao and Jih-Sheng Lai, Virginia Tech, United States

11:45AM *A Novel ZVT Switched Capacitor Converter for the Input-Stage of a Cascaded Two-Stage 48V VRM [#19579]*
Somnath Khatua, Debaprasad Kastha and Santanu Kapat, Indian Institute of Technology Kharagpur, India

Modeling and Control of Grid Connected Converter 2

Wednesday, September 26, 10:30AM-12:10PM, Room: B116, Chair: Brandon Grainger, Pablo Garcia

10:30AM *Robust Constant Switching Frequency Predictive Current Control with a Dichotomy Solution for Three-Phase Grid-Connected Inverters [#18686]*
Zhixun Ma, Xin Zhang and Jinsong He, Nanyang Technology University, Singapore; Nanyang Technological University, Singapore

10:55AM *Precision State Space Resonant Filter Structures for Digital Fixed-Point Converter Control Systems [#18461]*
Brendan McGrath, Carlos Teixeira and Grahame Holmes, RMIT University, Australia

11:20AM *Robust Feedback-Linearization Technique for Grid-tied LCL Filter Systems Using Disturbance Estimation [#18385]*
Ahmed Al-Durra and Rachid Errouissi, Khalifa University of Science and Technology, United Arab Emirates

11:45AM *Comparative Current Control Performance between PI and Proportional-Resonant (PR) controllers for Single-Phase Grid-Tied Inverters Operating in Both Continuous and Discontinuous Current Mode [#19267]*
Nam Hoai Le and Jun-ichi Itoh, Nagaoka University of Technology, Japan

Stability in Power Converters 3

Wednesday, September 26, 10:30AM-12:10PM, Room: C121, Chair: Vladimir Blasko, Alessandro Costabeber

10:30AM *Stability Analysis and Resonance Suppression in Converter System with Coupled LCL and LC filters [#18926]*
Ran Cheng, Yubo Song and Ke Ma, Shanghai Jiao Tong University, China

10:55AM *DC Current Bus Distributed Power System and Its Stability Analysis [#18092]*
Yuqi Wei, Quanming Luo, Si Chen, Jian Huang and Luowei Zhou, Chongqing University, China

11:20AM *Improved real-time stability assessment of grid-connected systems using multiple-input-multiple-output identification methods [#18151]*
Roni Luhtala, Tomi Roinila and Tuomas Messo, Tampere University of Technology, Finland

11:45AM *A stability criterion based on common denominator of system-level transfer functions for multiple multifunctional converters system [#18933]*
Ye Zhu and Dehong Xu, Zhejiang University, China

Design by Optimization of Power Converters

Wednesday, September 26, 10:30AM-12:10PM, Room: A108, Chair: Fred Wang, Luca Corradini

10:30AM *Design Method of DC Power Supply for Superposing 20kHz/100A Peak to Peak Sinusoidal Current with Several Hundred DC Current to Analyze Battery AC Impedance [#18868]*
Jin Xu, Toshihiko Kishimoto and Noboru Shimosato, Myway Plus Corporation, Japan

10:55AM *Efficiency Comparison in Power Converters under Transient Operation Conditions: Application to Hybrid Energy Storage systems [#19300]*
Jorge Garcia, Cristina Gonzalez-Moran, Pablo Garcia and Pablo Arboleya, University of Oviedo, Spain

11:20AM *A Reduced-Order Technique for Controller Design of Voltage Source Inverters [#19167]*
Aswad Adib and Behrooz Mirafzal, Kansas State University, United States

11:45AM *Rapid co-optimisation of turn-on and turn-off gate resistor values in DC:DC power converters [#19557]*
Harry Dymond and Bernard Stark, University of Bristol, United Kingdom

Soft Magnetic Materials

Wednesday, September 26, 10:30AM-12:10PM, Room: B118, Chair: Jose Antonino-Daviu, Alfredo Munoz

10:30AM *Investigation and Modeling of Local Degradation in Soft Magnetic Materials [#18601]*
Marco Cossale, Martin Kitzberger, Gereon Goldbeck, Gerd Bramerdorfer, Dietmar Andessner and Wolfgang Amrhein, Johannes Kepler University Linz, Austria; Linz Center of Mechatronics, Austria

10:55AM *Characterization and Modeling of Soft Magnetic Materials for Improved Estimation of PWM-Induced Iron Loss [#18669]*
Le Chang, Thomas Jahns and Rolf Blissenbach, University of Wisconsin - Madison, United States; General Motors Global Propulsion Systems, United States

11:20AM *Compaction of SMC Materials by Applying External Magnetic Fields to the Mold [#19625]*
Emir Poskovic, Luca Ferraris, Andrea Cavagnino and Enrico Pallavicini, Politecnico di Torino, Italy

11:45AM *Detailed Comparison of Soft Magnetic Composite and Silicon-Iron Machines [#19584]*
Yik Ling Lim, Wen L. Soong and Nesimi Ertugrul, The Unviersity of Adelaide, Australia

Synchronous Reluctance Machines

Wednesday, September 26, 10:30AM-12:10PM, Room: B112, Chair: Abraham Gebregergis, Koji Kato

10:30AM *FEA-Augmented Design Equations for Synchronous Reluctance Machines [#19616]*
Simone Ferrari and Gianmario Pellegrino, Politecnico di Torino, Italy

10:55AM *Design Improvement of Line Start Synchronous Reluctance Motor with Dual Polarity [#19405]*
Ebrahim Amiri, Dimitrios Charalampidis and Bikrant Poudel, University of New Orleans, United States

11:20AM *Analytical Calculation of the Air-gap Flux Density and Magnetizing Inductance of Synchronous Reluctance Machines [#18323]*
Hang Shao, Sufei Li and Thomas Habetler, Georgia Institute of Technology, United States

11:45AM *Asymmetric Synchronous Reluctance Rotor Geometry Design: A Practical Approach [#19021]*
Giacomo Bacco and Nicola Bianchi, University of Padova, Italy

Induction Motor Drives

Wednesday, September 26, 10:30AM-12:10PM, Room: B110, Chair: Prerit Pramod, Rakib Islam

10:30AM *Improvement of Output Voltage Waveform in Dual Inverter Fed Open-winding Induction Motor at Low Speed Area [#18887]*
Akihito Mizukoshi and Hitoshi Haga, Nagaoka University of Technology, Japan

10:55AM *Torque and Speed Response Differences between Deadbeat-Direct Torque and Flux Control and Indirect Field Oriented Control for Induction Machine Drives [#19181]*
Kang Wang, Noor Baloch and Robert Lorenz, University of Wisconsin-Madison, United States; Yaskawa Electric Corporation, Japan

11:20AM *Improved Sensorless Speed Control Method for Linear Induction Motor Based Extended Adaptive Full-Order Observer [#18284]*
Renjun Dian, Wei Xu, Dong Hu and Yi Liu, Huazhong University of Science and Technology, China

11:45AM *Modulated Model Predictive Direct Power Control of DFIM Considering Magnetic Saturation Effects [#19237]*
Shafiq Ahmed Odhano, Sandro Rubino, Pericle Zanchetta and Radu Bojoi, The University Of Nottingham, United Kingdom; Politecnico di Torino, Italy

Predictive and other Control Techniques for Electric Drives
Wednesday, September 26, 10:30AM-12:10PM, Room: B113, Chair: Giulio De Donato, Pinjia Zhang

10:30AM *Model-Predictive Flux Control of 3L-NPC Fed Induction Motor Drives with Stator Flux Error Based Two-stage Optimization [#18017]*
Ilham Osman, Xiao Dan and Rahman Faz, The University of New South Wales, Australia

10:55AM *Model Predictive Direct Flux Vector Control of Surface Permanent Magnet Motor Drives [#19651]*
Sandro Rubino, Radu Bojoi, Eric Armando and Alberto Tenconi, Politecnico di Torino, Italy

11:20AM *Fast and Robust Model-Free Predictive Control for Synchronous Reluctance Motor Drives [#18745]*
Paolo Gherardo Carlet, Fabio Tinazzi, Mauro Zigliotto and Silverio Bolognani, University of Padova, Italy

11:45AM *Harmonic Torque Reduction Using Adaptive Sector-Based Torque Feedforward Method for PMSM Drive [#18333]*
Jun Lee and Jung-Ik Ha, Seoul National University, Korea (South)

WBG gate driver design
Wednesday, September 26, 10:30AM-12:10PM, Room: A105, Chair: Liming Liu, Shashank Krishnamurthy

10:30AM *Design of gate drive power supply with air core transformer for high dv/dt switching [#19365]*
Krishna Mainali, Ruxi Wang and Juan Sabate, General Electric Global Research, United States

10:55AM *A New Proportional Base Driver Technique for Minimizing Driver Loss of SiC BJT [#18546]*
Shiwei Liang, Zhigao Peng, Yize Shi, Jun Wang, Linfeng Deng and John Shen, Hunan Univerisity, China; Hunan University, China; Illinois Institute of Technology, United States

11:20AM *A High-Speed Gate Driver with PCB-Embedded Rogowski Switch Current Sensor for a 10 kV, 240A, SiC MOSFET Module [#19445]*
Wang Jun, Mocevic Slavko, DiMarino Christina, Burgos Rolando and Boroyevich Dushan, CPES, Virginia Tech, United States; CPES, Virginia Tech, United Kingdom

11:45AM *Voltage Balancing Control for Series Connected SiC-MOSFETs Based on Time Delay Adjustment [#19717]*
Keiji Wada and Katsuya Shingu, Tokyo Metropolitan University, Japan

Workshop: Power Electronics For Sustainable Energy Systems and Energy Sustainability
Wednesday, September 26, 10:30AM-12:10PM, Room: B114, Chair: Sudip Mazumder

Panel Session: Challenges of Simulating Power Electronic Systems in Real Time. Sampling Frequency vs. Model Fidelity
Wednesday, September 26, 10:30AM-12:10PM, Room: B115, Chair: Tony Lennon

Wednesday, September 26, 2:00PM-3:40PM

Wind Energy Applications

Wednesday, September 26, 2:00PM-3:40PM, Room: A107, Chair: Tausif Husain, Paul Barendse

2:00PM *Wind Energy Conversion System based on DFIG with three-phase Series Active Filter operating with Floating Capacitors [#19227]*
Italo Andre Cavalcanti de Oliveira, Cursino Brandao Jacobina and Nady Rocha, UFCG, Brazil; UFPB, Brazil

2:25PM *A Novel SiC-based Three-phase Fully Soft-switched Bridgeless AC/DC Step-up Converter with Current Fed Voltage Quadrupler Modules for Medium Voltage DC Grid in Wind Systems [#19326]*
Mehdi Abbasi and John Lam, York University, Canada

2:50PM *Improved DFIG Control Strategy under Three Phase Asymmetrical Grid Faults [#19707]*
Yipeng Song, Dao Zhou and Frede Blaabjerg, Aalborg University, Denmark

3:15PM *Small Signal Dynamic Model of a Self-Synchronising Current Regulated Rectifier for a Permanent Magnet Wind Energy Conversion System (WECS) [#19719]*
Brendan McGrath, Oscar Lopez Sanchez and Grahame Holmes, RMIT University, Australia; University of Vigo, Spain

HVDC Converter Systems

Wednesday, September 26, 2:00PM-3:40PM, Room: B117, Chair: Liyan Qu, Wei Qiao

2:00PM *Improved Fault Current Calculation Method for Pole-to-Pole Faults in MMC Multi-Terminal HVDC Grids Considering Control Dynamics [#18766]*
Marius Langwasser, Giovanni De Carne, Marco Liserre and Matthias Biskoping, University of Kiel, Germany; ABB Research Center Ladenburg, ABB AG, Germany

2:25PM *Series-Stacked Hybrid Modular Converter with DC Fault Blocking Capability for HVDC Application [#18946]*
Mahendra Ghat and Anshuman Shukla, Indian Institute of Technology Bombay, India

2:50PM *Modular Universal Converter for MVDC Applications [#19663]*
Liran Zheng, Xiangyu Han, Zheng An, Karthik Kandasamy, Rajendra Kandula, Maryam Saeedifard and Deepak Divan, Georgia Institute of Technology, United States

3:15PM *Modular Directed Series Multilevel Converter for HVDC Application [#18953]*
Siba Kumar Patro and Anshuman Shukla, Indian Institute of Technology Bombay, India

Power Quality

Wednesday, September 26, 2:00PM-3:40PM, Room: B111, Chair: Babak Parkhideh, David Ochs

2:00PM *Mitigating the Harmonics of Parallel-inverter Systems Considering Nonlinear Loads and Deadtime [#18355]*
Jiazhe Liu, Yang Qi and Yi Tang, Nanyang Technological University, Singapore

2:25PM *Artificial Neural Network based Dynamic Voltage Restorer for Improvement of Power Quality [#18443]*
Md. Samiul Haque Sunny, Eklas Hossain, Mikal Ahmad and Fuad Un-Noor, Khulna University of Engineering and Technology, Bangladesh; Oregon Tech, United States

2:50PM *Harmonic Minimization in Hybrid Cascaded Multilevel Inverter Using Modified Particle Swarm Optimization [#19052]*
Abhinandan Routray, Rajeev Kumar Singh and Ranjit Mahanty, Indian Institute of Technology (BHU), Varanasi, India

3:15PM *An Active Compensator to Counteract the Effects of Grid Impedance in Grid-Connected Inverter with an LCL Filter [#19353]*
He Yuanbin, Hang Lijun, Xie Xiaogao and Chung Shu-hung, Hangzhou Dianzi University, China; City University of Hong Kong, Hong Kong

Batteries modelling and management 1

Wednesday, September 26, 2:00PM-3:40PM, Room: C120, Chair: Phillip Kollmeyer, Mazharul Chowdhury

2:00PM *A Zero-Current-Switching Heater Based on Four-Resonant-State LC Converter for Low-Temperature Lithium-Ion Batteries of Electric Vehicles [#19095]*
Yunlong Shang, Yiming Zhang and Chris Mi, San Diego State University, United States

2:25PM *Three-port Dual Active Bridge Converter for Active Balancing in Large Battery Packs [#19301]*
Dorai Babu Yelaverthi, Muhammad Muneeb Ur Rehman and Regan Zane, Utah State University, United States

2:50PM *A Cooperative Cell Balancing Approach for Reconfigurable Supercapcitor Energy Storage Systems [#19409]*
Fu Jiang, Zhiqiang Meng, Hongtao Liao, Baolin Zhu, Muxing Han, Jun Peng, Heng Li and Zhiwu Huang, Central South University, China

3:15PM *Efficient On-Board Health Monitoring for Multicell Lithium-Ion Battery Systems Using Gaussian Process Clustering [#19577]*
Taesic Kim, Daewook Kang, Chang-Yeol Oh, Myoungho Kim and Juwon Baek, Texas A and M University-Kingsville, United States; Korea Electrotechonology Research Institute, Korea (South)

DC-DC isolated 1

Wednesday, September 26, 2:00PM-3:40PM, Room: C122, Chair: David Perreault, Ashish Kumar

2:00PM *Current Stress Optimization and Efficiency Increase of DAB with Triple-Phase-Shift Control for Whole Operating Range Based on 2-Dimensional Ergodicity Method [#19373]*
Qing Gu, Liqiang Yuan, Jintong Nie, Jianning Sun and Zhengming Zhao, Tsinghua University, China

2:25PM *A Zero-voltage-switched Isolated Resonant Converter with Reduced Voltage Stress [#18290]*
Ling Gu and Kai Peng, Nanjing University of Science and Technology, China

2:50PM *Design and Analysis Modular Three-Port Series-Resonant-Converter Operating as a DC Transformer [#18863]*
Kevin Tomas Manez and Zhe Zhang, Technical University of Denmark, Denmark

3:15PM *Synergetic Control of High-Frequency-Link Based Multi-Port Solid State Transformer [#19639]*
Kai Li, Tsinghua University, Beijing, China

Multi-level converters 5

Wednesday, September 26, 2:00PM-3:40PM, Room: B119, Chair: Adam Skorek, Harish Krishnamoorthy

2:00PM *A New Seven-Level Active Boost Neutral Point Clamped (7L-ABNPC) Inverter [#19114]*
Yam Siwakoti, Stephan Liese, Akshay Mahajan, Aswin Palanisamy, Dan Rogers and Frede Blaabjerg, University of Technology Sydney, Australia; Fraunhofer Institute for Solar Energy System, Germany; Oxford University, United Kingdom; Aalborg University, Denmark

2:25PM *A Super-Junction MOSFET-based 99%+ Efficiency T-Type Multilevel Converter [#18171]*
Neville McNeill, Xibo Yuan and Bosen Jin, University of Strathclyde, United Kingdom; University of Bristol, United Kingdom

2:50PM *Multilevel Converter Topologies with Internally Paralleled Power Stages [#18795]*
Zhongyi Quan and Yunwei Li, University of Alberta, Canada

3:15PM *Dual-Model Predictive Control for Cascaded H-Bridge Multilevel Active Rectifiers with DC Voltage Balancing [#18893]*
Merlin Chai, Naga Brahmendra Yadav Gorla and Sanjib Kumar Panda, National University of Singapore, Singapore

Grid Synchrinzation Techniques

Wednesday, September 26, 2:00PM-3:40PM, Room: B116, Chair: Yongheng Yang, Yongsug Suh

2:00PM *Single-Phase Multiple Delayed Signal Cancellation Filter-Based Enhanced Phase-Locked Loop for Accurate Estimations of Grid Voltage Information [#18077]*
Srinivas Gude and Chia-Chi Chu, National Tsing Hua University, Taiwan

2:25PM *Dynamic Phasor Modeling of SRF-PLL based Grid-Tie Inverter under Islanded conditions [#18733]*
Dev Venkatramanan and Vinod John, Indian Institute of Science, Bangalore, India

2:50PM *Linear Phase Locked Loop [#19600]*
Vlatko Miskovic, Vladimir Blasko, Thomas Jahns and Robert Lorenz, Danfoss Drives, United States; United Technologies Research Center, United States; University of Wisconsin - Madison, United States

3:15PM *Adaptive Synchronization Technique for Grid-Connected Three-phase Inverters based on Hopf Oscillator [#19065]*
Mingshen Li, Yonghao Gui, Erick Oviedo, Josep M. Guerrero and Juan C. Vasquez, Aalborg Universtiy, Denmark; IPICYT, Mexico

Power Quality

Wednesday, September 26, 2:00PM-3:40PM, Room: B113, Chair: Yam Siwakoti, Petar Grbovic

2:00PM *Adaptive Voltage Saturation Algorithms for Selective Harmonic Control in Shunt Active Power Filters [#19232]*
Albino Amerise, Michele Mengoni, Luca Zarri, Angelo Tani, Gabriele Rizzoli and Domenico Casadei, University of Bologna, Italy

2:25PM *Power Factor Correction in Isolated SEPIC Converter Fed SRM Drive [#18728]*
Aniket Anand and Bhim Singh, IIT Delhi, India

2:50PM *Series Compensator Based On Multilevel Converter With Cascaded Transformers And Shared Legs [#19133]*
Alan Felinto, Gregory Carlos, Cursino Jacobina and Joao Mello, Federal University of Campina Grande, Brazil; Federal Institute of Alagoas, Brazil

3:15PM *Power Quality Conditioner Based On Nine-Leg Converter With Floating Capacitors [#19585]*
Alan Felinto, Gregory Carlos, Cursino Jacobina and Joao Mello, Federal University of Campina Grande, Brazil; Federal Institute of Alagoas, Brazil

Reliability and Fault Tolerance in Multilevel Converters

Wednesday, September 26, 2:00PM-3:40PM, Room: A108, Chair: Luca Solero, Gregory Kish

2:00PM *Detection and Identification of Power Switch Failures Using Discrete Fourier Transform for Fault-Tolerant Operation of Flying Capacitor Multilevel Converters [#18713]*
Sai Tang, Daming Wang, Chao Zhang, Jun Wang, Zhikang Shuai, Xin Yin and Z. John Shen, Hunan University, China

2:25PM *Submodule Fault Diagnosis based on Capacitor Voltage Sliding-Mode Observer and Fast Diagnosis Criterion for Modular Multilevel Converter [#18936]*
Zhao Shanshan, Li Zuoyu, Chen Yu, Peng Li and Kang Yong, Huazhong univ. of Sci. and Tech., China; Inovance Technology Co., Ltd., China

2:50PM *Submodule Level Power Loss Balancing Control for Modular Multilevel Converters [#18522]*
Zhongxu Wang, Huai Wang, Yi Zhang and Frede Blaabjerg, Aalborg University, Denmark

3:15PM *Ageing Mitigation Control Method for Power Devices in Multilevel Inverters in Standalone PV Systems [#19631]*
Mokhtar Aly, Emad M. Ahmed and Masahito Shoyama, Aswan University, Egypt; Aljouf University, Saudi Arabia; Kyushu University, Japan

Materials and Loss Analysis

Wednesday, September 26, 2:00PM-3:40PM, Room: B118, Chair: Alfredo Munoz, Jose Antonino-Daviu

2:00PM *Modeling and Verification of Electrical Stress in Inverter-driven Electric Machine Windings [#19748]*
Yanyan Xie, Julia Zhang, Franco Leonardi, Alfredo Munoz, Feng Liang and Michael Degner, The Ohio State University, United States; Ford Motor Company, United States

2:25PM *Analysis and Reduction of Circulating Current Loss of Armature Wires in Permanent Magnet Synchronous Machines [#18219]*
Katsumi Yamazaki, Takahiro Furuhashi, Haiyan Yui, Hideki Ohguchi and Masao Shuto, Chiba Institute of Technology, Japan; Fuji Electric Co., Ltd., Japan

2:50PM *EM-thermal coupled simulation under various fault conditions of a triple redundant 9-phase PMASynRM [#18271]*
Yanwen Shi, Jiabin Wang and Bo Wang, University of Sheffield, United Kingdom

3:15PM *Additive Manufacturing of Shaped Profile Windings for Minimal AC Loss in Electrical Machines [#19278]*
Nick Simpson and Phil Mellor, University of Bristol, United Kingdom

Synchronous Machines

Wednesday, September 26, 2:00PM-3:40PM, Room: B112, Chair: Cong Ma, Nicola Bianchi

2:00PM *Investigation of Damper Inter-Bar Currents in Hydro-Generators With Unbalanced Load [#18217]*
Yang Zhan, Kangkang Kong, Guorui Xu and Haisen Zhao, North China Electric Power University, China

2:25PM *Design optimisation of cylindrical-rotor synchronous-induction motors [#19053]*
Mkhululi Mabhula and Maarten. J Kamper, Stellenbosch Univeristy, South Africa

2:50PM *Unstable Equilibrium Points in Standalone Synchronous Generator [#19754]*
Edwin Fonkwe Fongang, James Kirtley, Murilo Almeida and Ivan Celanovic, Massachusetts Institute of Technology, United States; Typhoon HIL, United States

3:15PM *Airgap Search Coil-based Detection of Damper Bar Failures in Salient Pole Synchronous Motors [#18049]*
Jangho Yun, Sanguk Park, Chanseung Yang, Sang Bin Lee, Jose Antonino-Daviu, Mladen Sasic and Greg Stone, Hyundai Electric Co., Korea, Republic of; Korea University, Korea, Republic of; Universitat Polytecnica de Valencia, Spain; Quaitrol Corp - Iris Power Engineering, Canada

Electric Drives with IPM Motors

Wednesday, September 26, 2:00PM-3:40PM, Room: B110, Chair: David Diaz Reigosa, Rashmi Prasad

2:00PM *Distortion-Minimizing Flux Observer for IPMSM based on Frequency-Adaptive Observers [#18632]*
Hyeon-Sik Kim, Seung-Ki Sul and Hyunjae Yoo, Seoul National University, Korea (South); LG Electronics. Co., Korea (South)

2:25PM *Experimental Identification of IPMSM Inductance and Flux-Linkage Considering Spatial Harmonics for High-Accuracy Simulation of IPMSM Drives [#18814]*
Joohyun Lee, Yong-Cheol Kwon and Seung-Ki Sul, Seoul National University, Korea (South)

2:50PM *Low Cost and High power density IPM Machine Drive System for Micro-Hybrid Application [#18999]*
Lei Hao, Chandra Namuduri, Chandra Mavuru and Gopalakrishnan Suresh, General Motors, United States; General Motors, India

3:15PM *Analytic Overmodulation Method and Application to IPMSM Current Control [#19094]*
Seungmin Hong, Heekwang Lee, Kwanghee Nam and Jaehong Kim, POSTECH, Korea, Republic of; Chosun University, Korea, Republic of

Power modules 2: current sharing & reliability

Wednesday, September 26, 2:00PM-3:40PM, Room: A105, Chair: Ty McNutt, Madhu Sudhan Chinthavali

2:00PM *Die Current Balancing of a Press-Pack SiC MOSFET [#19315]*
Nan Zhu, Min Chen and Dehong Xu, Zhejiang University, China

2:25PM *Long Term Reliability of Power Modules with Low Amplitude Thermomechanical Stresses and Initial Defects [#18408]*
Borong Hu, Sylvia Konaklieva, Li Ran, Nadia Kourra, Mark A. Williams and Wei Lai, The University of Warwick; Chongqing University, United Kingdom; The University of Warwick, United Kingdom; Chongqing University, China

2:50PM *Magnetic Integration into SiC Power Module for Current Balancing [#18811]*
Zichen Miao and Khai Ngo, Virginia Tech, United States

3:15PM *Short circuit reliability of automotive traction inverter power module [#19277]*
Krishna Prasad Bhat and Chingchi Chen, FORD MOTOR COMPANY, United States

Workshop: Power Electronics For Sustainable Energy Systems and Energy Sustainability
Wednesday, September 26, 2:00PM-3:40PM, Room: B114, Chair: Sudip Mazumder

Panel Session: Collaboration between Industry and Academia: How to Foster it?
Wednesday, September 26, 2:00PM-3:40PM, Room: B115, Chair: Sara Roggia, Giovanna Oriti

Wednesday, September 26, 4:00PM-5:40PM

Grid Integration of Renewable Energy Systems
Wednesday, September 26, 4:00PM-5:40PM, Room: A107, Chair: Yilmaz Sozer, Dinesh Kumar

4:00PM *A Soft-switched Four-port DC-DC Converter for Renewable Energy Integration [#18348]*
Jianwu Zeng, Taesic Kim and Vincent Winstead, Minnesota State University, Mankato, United States; Texas AM University-Kingsville, United States

4:25PM *Modular Static Distribution Controller for Distributed Energy Resource generation Applications [#19504]*
Faris Alfaris, Nima Yousefpoor and Subhashish Bhattacharya, North Carolina State University, United States; Quanta Technology, United States

4:50PM *Performance Verification of a New Integrated Droop Controller with a Novel Virtual-Impedance Based PLL for Parallel Operation of Inverters [#19587]*
Subhrasankha Ghosh and Souvik Chattopadhyay, Electrical Engg. Department, IIT Kharagpur, India

5:15PM *A center of mass determination for the optimum placement of the renewable energy sources for microgrids [#19693]*
Hassan Abdelgabir and Yilmaz Sozer, University of Akron, United States

Grid Connected Systems
Wednesday, September 26, 4:00PM-5:40PM, Room: B111, Chair: Joseph Olorunfemi Ojo, Ke Ma

4:00PM *Damping for Multi-paralleled Grid-Tied Inverters with LCL Filters [#18793]*
Olorunfemi Ojo, Tennessee Tech University, United States

4:25PM *Current Ripple Oriented Design of LCL Filter for Three-Phase Voltage-Source Converter with Different Wire Connections and Modulations [#18823]*
Weiyu Tang, Yubo Song and Ke Ma, Shanghai Jiao Tong University, China

4:50PM *An Adaptive Phase- Locked Loop for the Transient Stability Enhancement of Grid- Connected Voltage Source Converters [#18595]*
Heng Wu and Xiongfei Wang, Aalborg University, Denmark

5:15PM *A Novel Grid-connected Harmonic Current Suppression Control for Autonomous Current Sharing Controller-based AC Microgrids [#18506]*
Yajuan Guan, Aalborg University, Denmark

Grid Connected Converters- I

Wednesday, September 26, 4:00PM-5:40PM, Room: B117, Chair: Robert S. Balog, Martin Ordonez

4:00PM *Channel Modeling for Powerline Communications in Series-Connected PV Inverters [#19673]*
Daniel Evans and Robert Cox, UNC Charlotte, United States

4:25PM *Online Impedance Estimation in AC Grids Considering Parallel-Connected Converters [#19515]*
Andres Suarez, Pablo Garcia, Angel Navarro and Jose Manuel Cano, Universidad de Oviedo, Spain

4:50PM *A New Two Stage Differential Mode Power Converter for Large Scale PV Plants [#19478]*
Sinan A Sabeeh Al-Obaidi and Prasad Enjeti, Texas A and M University, United States

5:15PM *Modelling of Interconnected Converter System with Coupled LCL and LC Filters [#18924]*
Ran Cheng, Yubo Song and Ke Ma, Shanghai Jiao Tong University, China

DC-DC isolated 4

Wednesday, September 26, 4:00PM-5:40PM, Room: C120, Chair: Ngo Khai, Zheyu Zhang

4:00PM *Design and Implementation of a Dual-Input LLC Converter for PV-Battery Applications [#19506]*
Milad Tayebi, Xi Chen and Issa Batarseh, University of Central Florida, United States

4:25PM *A Quad Active Bridge based On-board Power Electronic Interface for an Electric Vehicle [#19514]*
Arun Chandrasekharan Nair, Vishal M.J. and B.G. Fernandes, Indian Institute of Technology Bombay, India

4:50PM *An Integrated Three-port DC/DC Converter for High Voltage Bus Based Photovoltaic Systems [#18971]*
Junyun Deng and Haoyu Wang, ShanghaiTech University, China

5:15PM *Model Predictive Control for an Active-Bridge-Active-Clamp (ABAC) Converter [#19731]*
Linglin Chen, Luca Tarisciotti, Alessandro Costabeber, Pericle Zanchetta and Patrick Wheeler, University of Nottingham, United Kingdom

DC-DC isolated 2

Wednesday, September 26, 4:00PM-5:40PM, Room: C122, Chair: Khurram Afridi, Alessandro Lidozzi

4:00PM *A Dual-Transformer-Based LLC Resonant Converter With Phase-Shift Control For Hold-Up Time Compensation Application [#18298]*
Zhiyuan Yu, Hongfei Wu, Wenmin Hua, Jianxin Zhu and Yan Xing, Nanjing University of Aeronautics Astronautics, China

4:25PM *Interleaved Half-bridge Flyback Converter with Zero-voltage Switching [#18203]*
Wen-Yu Huang, Tsorng-Juu Liang and Ming-Hsien Cheng, National Cheng Kung University, Taiwan

4:50PM *A Modular Soft-switched Silicon-Carbide Step-up Converter with a Dual Coupled LCL Resonant Networks and a Primary-Hybrid Variable Frequency/Phase-shift-Control [#19208]*
Mehdi Abbasi, Reza Emamalipour, Muhammad Ali Cheema and John Lam, York University, Canada; Northern Transformer, Canada

5:15PM *New FB-ZCS DC-DC Converter with Adaptive Energy Storage using Hybrid Phase-shift Frequency Modulation [#19509]*
Rohit Suryadevara and Leila Parsa, Rensselaer Polytechnic Institute, United States; University of California Santa Cruz, United States

Modeling and Control of DC-DC Converters 2

Wednesday, September 26, 4:00PM-5:40PM, Room: B119, Chair: Praveen Jain, Alessandro Costabeber

4:00PM *Design and Control of Tunable Piezoelectric Transformer Based DCDC Converter [#19540]*
Le Wang, Qiong Wang, Mudit Khanna, Rolando Burgos, Alfredo Vazquez Carazo and Khai D. T Ngo, Virginia Polytechnic Institute and State Univ., United States; Micromechatronics, Inc., United States; Virginia Polytechnic Institute and State Univ.,, United States

4:25PM *Average Current-Mode Control of A-Source Converter [#18734]*
Agasthya Ayachit, Mojtaba Forouzesh, Yam Siwakoti, Marian Kazimierczuk and Frede Blaabjerg, Wright State University, United States; Aalborg University, Denmark; University of Technology Sydney, Australia

4:50PM *High Frequency Small Signal Model for Inverse Charge Constant On-time (IQCOT) Control [#19539]*
Syed Bari, Qiang Li and Fred Lee, CPES, ECE, Virginia Tech, United States; CPES, ECE,Virginia Tech, United States

5:15PM *A Novel Capacitor Current Constant On-Time Controlled Buck Converter at 4-MHz Switching Frequency [#18841]*
Sheng Siang Pan, Ching Jan Chen and Chieh Ju Tsai, National Taiwan University, Taiwan

Modeling and Control of AC-DC Converters

Wednesday, September 26, 4:00PM-5:40PM, Room: B116, Chair: Zheng Wang, Shafiq Ahmed Odhano

4:00PM *Backstepping-based DPC Scheme Of AC/DC Converter Under Unbalanced Power Supply [#18078]*
Jingjing Huang and Xin Zhang, Nanyang Technological University, Singapore

4:25PM *Control Schemes for Second Harmonic Current Reduction in Two-Stage Single-Phase Converter: An Overview From the Perspective of DC-Bus Port-Impedance Characteristic [#18463]*
Li Zhang, Xinbo Ruan and Xiaoyong Ren, Nanjing Univ. of Aeronautics and Astronautics, China

4:50PM *An Improved Control Scheme for Single-Phase Buck-type Rectifier with Low DC Voltage Ripple and AC Current Distortion [#19488]*
Wenli Yao, Yan Xu, Yi Tang, Poh Chiang Loh and Bin Gou, Nanyang Technological University, Singapore; Chinese University of Hong Kong, Hong Kong

5:15PM *Robust Direct Power Control of PWM Rectifier with DC Voltage Ripple Elimination under Unbalanced Network [#19677]*
Yongchang Zhang and Jie Liu, North China University of Technology, China

Modeling and Control of Modular Multilevel Converters 2

Wednesday, September 26, 4:00PM-5:40PM, Room: A108, Chair: Hirofumi Akagi, Qin Lei

4:00PM *State-space Modeling and Control of the Modular Multilevel Clamped Capacitor Converter [#18351]*
Liyao Wu and Maryam Saeedifard, Georgia Institute of Technology, United States

4:25PM *Discrete-Time Modeling of MMC based on Piecewise Smooth System Analysis [#18631]*
Yushuang Liu, Meng Huang, Xiaoming Zha, Herbert Iu and Wei Hu, Wuhan University, China; The University of Western Austral, Australia; StateGrid Hubei Electric Power ResearchInstitute, China

4:50PM *Investigation and Compensation of Circulating Current Errors in Low Frequency Operation of Modular Multilevel Converters [#18630]*
Muneer Al Sabbagh and Longya Xu, The Ohio State University, United States

5:15PM *A New DC Fault Blocking Capability Technique for Modular Multilevel Converters [#19177]*
Iman Aghabali and Mehdi Narimani, McMaster University, Canada

PM Machines

Wednesday, September 26, 4:00PM-5:40PM, Room: B112, Chair: Nicola Bianchi, Cong Ma

4:00PM *Design and Characterization of a Radial Flux Wound Field and Permanent Magnet Hybrid Excitation Synchronous Machine [#19700]*
Antonio Di Gioia, Ian P. Brown and Fabio Giulii Capponi, Illinois Institute of Technology, United States; University of Rome "La Sapienza", Italy

4:25PM *Novel Hybrid Excited Doubly Salient Permanent Magnet Machines with Asymmetric Stator Poles [#18332]*
Mingjie He, Wei Xu and Caiyong Ye, Huazhong University of Science and Technology, China

4:50PM *Cogging Torque Minimization on a Mass-Produced Sub-Fractional Horsepower Brushless Direct Current Claw-Pole Motor [#18050]*
Stefan Leitner, Hannes Gruebler and Annette Muetze, CD-Lab BL-Drives, Graz University of Technology, Austria

5:15PM *Influence of Clamping Bolts on Electromagnetic Performance of PMSM Machines and Its Restraining Methods [#18403]*
Jiabei Zhu, Lijian Wu, Xiaoyan Huang and Youtong Fang, Zhejiang University, China

Peter Lawrenson Memorial - Switched Reluctance Machines

Wednesday, September 26, 4:00PM-5:40PM, Room: B118, Chair: David Dorrell, Peter Wung

4:00PM *Novel Rotor Configuration for Switched Reluctance Motors Which Reduces Copper Loss with Suppression of Torque Ripple and Input Current Ripple [#18772]*
Takayuki Kusumi, Takuto Hara, Kazuhiro Umetani and Eiji Hiraki, Okayama University, Japan

4:25PM *Optimal Design of Outer Rotor Switched Reluctance Machines for Direct Drive Rim Installations [#19481]*
Vandana Rallabandi, Jie Wu, Aaron Cramer, Ping Zhou and Dan Ionel, University of Kentucky, United States; ANSYS, Inc, United States

4:50PM *DC Input Current Ripple Reduction in SRM Drive for High Volumetric Power Density Application [#19770]*
Sifat Chowdhury, Salman Harasis, Omer Gundogmus, Lavanya Vadamodala, Shuvajit Das, Yilmaz Sozer, Fernando Venegas and David Colavincenzo, University of Akron, United States

5:15PM *A Novel Self Cooling SRM for Electric Hand Tools [#19760]*
Kouichi Koinuma, Aiso Kohei and Akatsu Kan, Shibaura institute of technology, Japan

Control of Sync-Rel Drives

Wednesday, September 26, 4:00PM-5:40PM, Room: B113, Chair: Gianmario Pellegrino, Di Pan

4:00PM *An Approach to Automatic Inductance Measurements of Synchronous Reluctance Machines including Cross-Saturation [#19028]*
Rajendra Thike and Pragasen Pillay, Concordia University, Canada

4:25PM *Flux Weakening Control for Synchronous Reluctance Machines Based on Parameters Estimated at Stand-still [#18639]*
Sang-Hoon Lee, Hak-Jun Lee and Young-Doo Yoon, SoluM, Korea, Republic of; LSIS, Korea, Republic of; Hanyang University, Korea, Republic of

4:50PM *Over-modulation with Improved Stability for Synchronous Reluctance Motor Drives incorporating Field-weakening Operation [#18032]*
Xinan Zhang and Gilbert Foo, Nanyang Technological University, Singapore; Auckland University of Technology, New Zealand

5:15PM *An Improved Speed-Senorless Flux Observer based on Voltage Model for Synchronous Reluctance Machines [#19036]*
Feilang Li, Sibei Liu, Wenxi Yao and Kevin Lee, Zhejiang University, China; Eaton Corporation, United States

SiC devices & applications

Wednesday, September 26, 4:00PM-5:40PM, Room: B110, Chair: Rolando Burgos, Ruxi Wang

4:00PM *SiC MOSFET versus CoolMOS - Switching Loss Comparison in Different Switching Cell Configurations [#19103]*
Handong Gui, Zheyu Zhang, Ren Ren, Ruirui Chen, Jiahao Niu, Leon M. Tolbert, Fred Wang, Benjamin J. Blalock, Daniel Jes Costinett, Benjamin B. Choi and Gerald V. Brown, University of Tennessee, Knoxville, United States; NASA Glenn Research Center, United States

4:25PM *Design Comparison of SiC MOSFETs for Linear-Mode Operation [#19198]*
Heather O'Brien, Damian Urciuoli, Aderinto Ogunniyi and Brett Hull, US Army Research Laboratory, United States; Wolfspeed, United States

4:50PM *Sizing Selection Optimization of SiC/Si Hybrid Switch in DC/DC Buck Converters [#19272]*
Fanxing Yuan, Jun Wang, Zongjian Li, Cheng Zeng, Zhizhi He, Xi Jiang and Z.John Shen, Hunan University, China

5:15PM *Development and Validation of a SiC based 50-kW Grid-Connected PV Inverter [#19393]*
Akanksha Singh, Madhu Chinthavali, Kumaraguru Prabakar, Zhiqiang Wang and Steven Campbell, National Renewable Energy laboratory, United States; Oak Ridge National Laboratory, United States; National Renewable Energy Laboratory, United States

Wireless Power Transfer 3
Wednesday, September 26, 4:00PM-5:40PM, Room: A105, Chair: ChunTaek Rim, Hua Zhang

4:00PM *A Monotonic Output Regulation Method for Series-series Compensated Inductive Power Transfer Systems with Improved Efficiency and Communication-less Control [#19061]*
Shuxin Chen, Hongchang Li and Yi Tang, Nanyang Technological University, Singapore

4:25PM *Radiative Noise Reduction Technique using 12 Coils Suitable for High-power Inductive Power Transfer System [#18511]*
Keisuke Kusaka and Jun-ichi Itoh, Nagaoka University of Technology, Japan

4:50PM *DC Modeling of an LCC Resonant Compensation Network in Wireless Power Transfer Systems [#19701]*
Reza Tavakoli and Zeljko Pantic, Utah State University, United States

5:15PM *Impedance Matching to Maximize Induced Current in Repeater of Resonant Inductive Coupling Wireless Power Transfer Systems [#19669]*
Masataka Ishihara, Kazuhiro Umetani and Eiji Hiraki, Okayama university, Japan; Okayama University, Japan

Panel Session: The power electronics Workforce of the future: do Internships and apprenticeships really pay off ?
Wednesday, September 26, 4:00PM-5:40PM, Room: C121, Chair: Nanci Vogtli, Keith Evans

Workshop: Power Electronics For Sustainable Energy Systems and Energy Sustainability
Wednesday, September 26, 4:00PM-5:40PM, Room: B114, Chair: Sudip Mazumder

Panel Session: Advancements, Challenges, and End-Games in Power Supply on Chip (PwrSoC)
Wednesday, September 26, 4:00PM-5:40PM, Room: B115, Chair: Hanh-Phuc Le

Thursday, September 27, 8:30AM-10:10AM

Solar PV Systems
Thursday, September 27, 8:30AM-10:10AM, Room: A107, Chair: Behrooz Mirafzal, Wasi Uddin

8:30AM *A GaN-Based High-Efficiency Solar Optimizer with Double Pulse Duty Modulation to Reduce Number of Power Transistors for DC Microgrid System [#18194]*
Xiaonan Zhao, Virginia Tech, United States

8:55AM *Design Optimization of a PV-Battery Series Integrated String Inverter for Residential and Commercial Rooftop Applications [#18969]*
Namwon Kim and Babak Parkhideh, University of North Carolina at Charlotte, United States

9:20AM *Optimal Solar PV Sizing for Inverters Based on the Specific Local Climate [#19501]*
Robabeh Nasiri, Mehdy Khayamy, Mohammad Rashidi and Adel Nasiri, UW-Milwaukee, United States

9:45AM *A Novel Differential Power Processing Architecture for a Partially Shaded PV String Using Distributed Control [#19590]*
Somanna Mallangadabose, Mohamed Badawy and Yilmaz Sozer, San Jose State University, United States; The University of Akron, United States

Grid Connected Converters- II

Thursday, September 27, 8:30AM-10:10AM, Room: B117, Chair: Mehdi Narimani, S. Ali Khajehoddin

8:30AM *Single-step commutation method for three-phase to single-phase matrix converter [#19340]*
Shunsuke Takuma and Itoh Jun-ichi, Nagaoka University of Technology, Japan

8:55AM *Distributed Predictive Control Scheme for Grid Tied Cascaded Multilevel Impedance Source Inverter with LVRT Capability [#19530]*
Sarthak Jain, Mitchell Easley and Mohammad B Shadmand, Texas A and M University, United States; Kansas State University, United States

9:20AM *Zero-Voltage Switching Control of a Grid-Connected Interleaved Inverter with Variable Switching Frequency [#19533]*
Yao Zhigang and Lu Shuai, Chongqing University, China

9:45AM *Current-Fed Quasi Z-Source Inverter based PV Distributed Generation Controller [#19636]*
Faris Alfaris and Subhashish Bhattacharya, North Carolina State University, United States

Renewable Energy Systems- I

Thursday, September 27, 8:30AM-10:10AM, Room: B111, Chair: Enrico Santi, Pourya Shamsi

8:30AM *A Universal Model Predictive Control for Practical AC Microgrids with PVs and Battery Energy Storage Systems [#18174]*
Yinghao Shan, Jiefeng Hu and Ka Wai Cheng, The Hong Kong Polytechnic University, Hong Kong

8:55AM *Integrated Series Transformer in Cascade Converters for Photovoltaic Energy Systems [#19362]*
Cristian Verdugo, Mohamed A. Elsaharty and Pedro Rodriguez, Polytechnic University of Catalonia, Spain; Loyola Andalucia University, Spain

9:20AM *An Average Model Predictive Control of Quasi-Z-Source Modular Cascaded Photovoltaic Converter [#18853]*
Yushan Liu and Yaosuo Xue, Beihang University, China; Oak Ridge National Laboratory, United States

9:45AM *Filter Design for Three-Level T-type NPC Transformerless PV Inverters with Reduced CMV Effects [#18866]*
Changpeng Jiang, Zhongyi Quan and Yunwei Li, University of Alberta, Canada

DC-DC isolated 3

Thursday, September 27, 8:30AM-10:10AM, Room: C122, Chair: Qiang Li, Daniel Costinett

8:30AM *Variable Frequency Phase Difference-Controlled CLLC Resonant Bidirectional DC-DC Converter Featuring Wide-Range ZVS Performance with Reactive Power Reduction [#18655]*
Tomokazu Mishima and Yasutaka Koga, Kobe University, Japan

8:55AM *Modeling and Control of a Three-Phase Dual-Active Bridge Converter with Hybrid Modulation Schemes [#18759]*
Jingxin Hu, Zhiqing Yang, Nurhan Rizqy Averous and Rik W. De Doncker, PGS, E.ON Energy Research Center, RWTH Aachen, Germany

9:20AM *Dead-time Compensation with DC Offset Current Elimination Method using Three-level Operation for Dual Active Bridge DC-DC Converter [#19037]*
Jun-ichi Itoh, Kengo Kawauchi and Hayato Higa, Nagaoka University of Technology, Japan

9:45AM *10 kW High Efficiency Compact GaN-Based DC/DC Converter Design [#19385]*
Bingyao Sun and Rolando Burgos, Virginia Tech, CPES, United States

DC-DC isolated 5

Thursday, September 27, 8:30AM-10:10AM, Room: C120, Chair: Marcello Pucci, Markus Andresen

8:30AM *A comparative study of conventional and T-type ZVS-PWM full-bridge converters [#18609]*
Javad Khodabakhsh and Gerry Moschopoulos, Western University, Canada

8:55AM *Analysis and Design of a Novel High-Gain Full-Bridge Converter For Renewable Energy Systems [#18617]*
Prashanth Prabhu and Gerry Moschopoulos, University of Western Ontario, Canada

9:20AM *A High-Density Low-Isolation-Capacitance Multi-Channel GaN Power Supply for Gate Drivers of 10 kV, 240 A SiC MOSFET Modules [#19637]*
Jiewen Hu, Jun Wang, Rolando Burgos and Dushan Boroyevich, Center for Power Electronics Systems, United States

9:45AM *A Three-Phase Dual-Active-Bridge DC-DC Immittance Converter [#18088]*
Akif Zia Khan, Ka-Hong Loo and Yuk Ming Lai, The Hong Kong Polytechnic University, Hong Kong

DC-AC single-phase 3

Thursday, September 27, 8:30AM-10:10AM, Room: B119, Chair: Madhav Manjrekar, Keiji Wada

8:30AM *A Single-Phase Double T-Type Seven-Level Inverter [#18817]*
Jianfei Chen, Caisheng Wang, Jian Li and Kewei Ding, Wayne State University, United States; Chongqing University, China

8:55AM *Design and Implementation of High Frequency Power Supply with Constant Power Output for Plasma Applications [#18208]*
Jin Zhao, Jianzhong Zhang, Zakiud Din and Zhengguo Qian, Southeast University, China

9:20AM *Energy-Buffered Single-phase inverter operating in the Fundamental Limit of Indirect Power [#19269]*
Jose A. Cobos, Regina Ramos, Diego Serrano, Jesus Oliver and Pedro Alou, Universidad Politecnica de Madrid, Spain

9:45AM *A battery-integrated high-frequency transformer-coupled phase-modulated PV inverter [#19122]*
Shayak Chaudhuri, Shiladri Chakraborty, Atul Banjare and Souvik Chattopadhyay, Indian Institute of Technology Kharagpur, India

Converter Control in Microgrids and Distributed Generation 2

Thursday, September 27, 8:30AM-10:10AM, Room: B116, Chair: Kai Sun, Junichi Itoh

8:30AM *Hybrid Energy Storage Control in a Remote Military Microgrid with Improved Supercapacitor Utilization and Sensitivity Analysis [#19786]*
Giovanna Oriti, Norma Anglani and Alexander Julian, Naval Postgraduate School, United States; University of Pavia, Italy, Italy; Consultant, United States

8:55AM *Distributed Control Alternatives of Modular Power Converters for Hybrid DC/AC Microgrids [#19520]*
Geber Villa, Carlos Gomez-Aleixandre, Pablo Garcia and Jorge Garcia, University of Oviedo, Spain

9:20AM *Autonomous DC-Link Voltage Restoration for Grid-Connected Power Converters Providing Virtual Inertia [#18929]*
Ke Guo, Jingyang Fang and Yi Tang, Nanyang Technological University, Singapore

9:45AM *Communication-Less Control of Two-Stage Photovoltaic System with Multiple Distributed Dual-Input Central Capacitor Converters [#18942]*
Jiaxin Liu, Feng Gao and Mengxing Chen, Shandong University, China; Aalborg University, Denmark

EMI in Power Converters

Thursday, September 27, 8:30AM-10:10AM, Room: C121, Chair: Jason Lai, Annette Muetze

8:30AM *Accurate Common Mode Noise Models For Three Level T-Type Neutral Point Clamped Converters [#19564]*
Srinivas Gulur, Vishnu Mahadeva Iyer and Subhashish Bhattacharya, North Carolina State University, United States

8:55AM *Capacitive Coupling in T-shape Related EMI Filters: Mechanism, Effects, and Mitigation [#18593]*
Bo Liu, Ren Ren, Fred Wang, Daniel Costinett and Zheyu Zhang, the University of Tennessee, United States

9:20AM *A Technique to Predict EMI Noise Spectrum in Wide Frequency Ranges based on the Principles of Spectrum Analyzers [#18492]*
Le Yang, Hui Zhao and Shuo Wang, University of Florida, United States

9:45AM *Computationally Efficient Model Predictive Control for AC-DC-AC Converter with Common Mode Voltage Elimination [#18497]*
Muslem Uddin, Galina Mirzaeva and Graham Goodwin, The University of Newcastle, Australia

Modulation Techniques

Thursday, September 27, 8:30AM-10:10AM, Room: A108, Chair: Yi Tang, Vito Giuseppe Monopoli

8:30AM *Common Mode Voltage Reduction in Active Front End Drive System under Different Rectifier/Inverter PWM Switching Frequencies [#18468]*
Yujia Cui and Lixiang Wei, Rockwell Automation, United States

8:55AM *Asymmetric Pulse Width Modulation for Improving the Reliability of Inverters in Adjustable Speed Motor Drive Systems [#18590]*
Choi Ui-Min, Vernica Ionut and Blaabjerg Frede, Aalborg University, Denmark

9:20AM *Baseband distortion compensation for high-precision power electronics using regular sampled pulse-width modulators with triangular carrier [#18533]*
Bas Vermulst, Eindhoven University of Technology, Netherlands

9:45AM *Evaluation System to Find Optimal Switching Pattern of Active Gate Drive Control for Full-Bridge Inverter Circuit [#19553]*
Yu Shan Cheng, Tomoyuki Mannen, Keiji Wada, Koutaro Miyazaki, Makoto Takamiya and Takayasu Sakurai, Tokyo Metropolitan University, Japan; The University of Tokyo, Japan

Machines for Transportation 2

Thursday, September 27, 8:30AM-10:10AM, Room: B114, Chair: Sara Roggia, Ronghai Qu

8:30AM *Contactless Rotor Excitation for Traction Motors [#19152]*
Tsarafidy Raminosoa and Randy Wiles, Oak Ridge National Laboratory, United States

8:55AM *Power-Hardware-in-the-loop based Emulation of a Variable Flux Machine [#18081]*
K. S. Amitkumar, Rajendra Thike and Pragasen Pillay, Concordia University, Canada

9:20AM *Investigation of Switched Reluctance Generator System for Latest Hybrid Electric Vehicle [#18477]*
Akira Chiba and Nanaho Kawata, Tokyo Institute of Technology, Japan

9:45AM *Modelling and operating characteristics of air-cored resonant induction machines [#18398]*
Matteo Felice Iacchetti, Alexander Smith, Rajesh Deodhar and Keisuke Mishima, University of Manchester, school of EEE, United Kingdom; IMRA Europe SAS, United Kingdom

Flux Switching Machines

Thursday, September 27, 8:30AM-10:10AM, Room: B118, Chair: Rukmi Dutta, Rajib Mikail

8:30AM *Modelling of Inter-Turn and Inter-Phase Short-Circuit of Flux-Switching Permanent Magnet Motors [#18131]*
Guang-Jin Li, Griffo Antonio, Zi-Qiang Zhu, Javier Ojeda and Gabsi Mohamed, The University of Sheffield, United Kingdom; Ecole Normale Superieure de Cachan, France

8:55AM *A Novel Flux Reversal Permanent Magnet Machine with Multi MMF Working Harmonics [#18361]*
Yuting Gao, Dawei Li, Ronghai Qu and Ziyi Liang, Huazhong University of Science and Technology, China

9:20AM *Novel Experimentation of a 10 kW Geared Medium-Speed Wound-Field Flux Switching Wind Generator Drive [#18321]*
Udochukwu Bola Akuru and Maarten Jan Kamper, Stellenbosch University, South Africa

9:45AM *Investigation of The Rotor Structure Influence on The Windage Loss and Efficiency of FSPM Machine [#19733]*
Mingda Liu, William Sixel, Yingjie Li and Bulent Sarlioglu, University of Wisconsin-Madison, United States

Thermal Modeling of Electric Machines 2

Thursday, September 27, 8:30AM-10:10AM, Room: B112, Chair: Zbigniew Gmyrek, Jose Antonino-Daviu

8:30AM *Design Considerations of Heat Guides Fabricated using Additive Manufacturing for Enhanced Dissipative Heat Transfer in Electrical Machines [#18196]*
Wrobel Rafal and Hussein Ahmed, Newcastle University, United Kingdom; HiETA Technologies Ltd., United Kingdom

8:55AM *A Combined 2-D Analytical and Lumped-Parameter Thermal Model for High Power Density Permanent Magnet Machines with Concentrated Windings [#18880]*
Xinggang Fan, Dawei Li, Ronghai Qu and Cong Wang, Huazhong University of Scicence and Technology, China

9:20AM *Lumped-parameter and 3D thermal model of a PMASynRM under fault conditions with asymmetric temperature distribution [#18270]*
Yanwen Shi, Jiabin Wang and Bo Wang, University of Sheffield, United Kingdom

9:45AM *A New Technique for Estimating Equivalent Thermal Conductivity of Impregnated Electrical Windings Formed with Round Conductors [#18044]*
Sabrina Ayat, Haipeng Liu and Rafal Wrobel, University of Bristol, United Kingdom; Beijing Institute of Technology, China; University of Newcastle, United Kingdom

Direct Torque Control of Electric Drives

Thursday, September 27, 8:30AM-10:10AM, Room: B115, Chair: Radu Bojoi, Kyo-Beum Lee

8:30AM *Robust Direct Torque Control for Six-Phase Symmetrical Winding Permanent Magnet Synchronous Motor [#18129]*
Xiaogang Lin, Wenxin Huang, Wen Jiang and Yong Zhao, Nanjing University of Aeronautics and Astronauti, China

8:55AM *Low Switching Frequency Deadbeat-Direct Torque and Flux Control of Wound Field Synchronous Machines [#18807]*
Yue Nie, Ian Brown and Daniel Ludois, Illinois Institute of Technology, United States; University of Wisconsin-Madison, United States

9:20AM *Extending High Speed Operating Range of Induction Machines Drives using Deadbeat-Direct Torque and Flux Control with Precise Flux Weakening [#19451]*
Yang Xu and Robert Lorenz, University of Wisconsin-Madison, United States

9:45AM *Maximum Torque per Ampere Control Based on Active Flux Concept for DTC of IPMSMs [#18649]*
Saide Liu, Wenxin Huang, Xiaogang Lin, Yong Zhao and Wen Jiang, Nanjing Univ. of Aeronaut. and Astronaut., China

Control Issues in Electric Drives 2

Thursday, September 27, 8:30AM-10:10AM, Room: B113, Chair: Jul-Ki Seok, Jesus Doval Gandoy

8:30AM *Control of Variable Frequency Drive PWM to Mitigate Motor Overvoltage Due to Double Pulsing in Reflected Wave Phenomenon [#19440]*
Han Xiong, Julia Zhang and Annette von Jouanne, The Ohio State University, United States; Baylor University, United States

8:55AM *Stator-Flux-Oriented Control of Synchronous Motors: Design and Implementation [#18981]*
Hafiz Asad Ali Awan, Marko Hinkkanen, Radu Bojoi and Gianmario Pellegrino, Aalto University, Finland; Politecnico di Torino, Italy

9:20AM *A Frequency-Modulated Space Vector Pulse-Width Modulation for Ripple Current Control of Permanent-Magnet Motor Drives [#19535]*
Yue Zhao, University of Arkansas, United States

9:45AM *Control System for Open-End Winding Surface PM Synchronous Machines with a Floating Capacitor Bridge [#19783]*
Albino Amerise, Michele Mengoni, Luca Zarri, Andrea Formentini, Luca Rovere and Pericle Zanchetta, University of Bologna, Italy; The University of Nottingham, United Kingdom; the University of Nottingham, United Kingdom

Magnetics for EMI

Thursday, September 27, 8:30AM-10:10AM, Room: B110, Chair: Jose Cobos, Chingchi Chen

8:30AM *A Universal DM/CM Physical Model for Power Transformer for EMI within the Conducted and Radiated Frequency Range [#19718]*
Hui Zhao, Juntao Yao and Shuo Wang, University of Florida, United States

8:55AM *A Modeling Technique for Designing High-Frequency Three-Phase Common-Mode Inductors [#18832]*
Shotaro Takahashi, Satoshi Ogasawara, Masatsugu Takemoto, Koji Orikawa and Michio Tamate, Hokkaido University, Japan; Fuji Electric co.,Ltd., Japan

9:20AM *Common-Mode Noise Elimination in Planar Transformers for LLC Resonant Converters [#19233]*
Mohammad Ali Saket Tokaldani, Martin Ordonez, Marian Craciun and Chris Botting, University of British Columbia, Canada; Delta-Q Technologies, Canada

9:45AM *Transformer Shielding Techniques for Reducing Common Mode Radiated Emission in Flyback Converters [#19556]*
Juntao Yao, Yiming Li, Hui Zhao and Shuo Wang, University of Florida, United States

Medical Applications

Thursday, September 27, 8:30AM-10:10AM, Room: A105, Chair: Mark J Scott, Juncheng(Lucas) Lu

8:30AM *Control Area Expansion Using Null Space Vector Injection Under Current Limit in Magnetic Manipulation System [#18335]*
Jin-Su Hong and Jung-Ik Ha, Seoul National University, Korea (South)

8:55AM *Magnetic-Vector Controlled Three-Phase Magnetic Guidance System [#18062]*
Ray-Lee Lin and Jia-Chi Liu, National Cheng Kung University, Taiwan

9:20AM *Design of a Portable Pulsed Power System for Needle-free Jet Injection [#18442]*
Nick N. L. Do, Andrew J. Taberner and Bryan P. Ruddy, The University of Auckland, New Zealand

9:45AM *Design Considerations and Performance Test for SiC MOSFET Based 1000V/ 1.5MHz Pulse Power Inverter [#18491]*
Chunhui Liu and Lei Qin, Arizona State University, United States

Thursday, September 27, 10:30AM-12:10PM

Power Converters for Energy Storage Systems

Thursday, September 27, 10:30AM-12:10PM, Room: A107, Chair: Iftekhar Hasan, Afshin Izadian

10:30AM *Optimization Method for the Integration of Hybrid Energy Storage Systems in Industrial Applications [#19282]*
Irene Pelaez, Sarah Saeed, Geber Villa and Pablo Garcia, University of Oviedo, Spain

10:55AM *A New Quasi-Resonant Soft-Switched Bidirectional DC/DC Converter for Energy Storage Application [#19283]*
Devina Aggarwal and John Lam, York University, Canada

11:20AM *A Novel Soft-switched Power Converter Architecture with an Integrated Energy Storage Interface Compatible with DC and AC Energy Sources [#19297]*
Sanjida Moury and John Lam, York University, Canada

11:45AM *An Integrated Control Strategy for State of Charge Balancing with Output Voltage Control of Serially Connected Battery Management System [#19685]*
Sifat Chowdhury, Yilmaz Sozer and Alex De Abreu Garcia, University of Akron, United States

Renewable Energy Systems- II

Thursday, September 27, 10:30AM-12:10PM, Room: B117, Chair: Behrooz Mirafzal, Mohammad B Shadmand

10:30AM *Topologies of Switched-Inductor Switched-Capacitor Based Enhanced Boost Z-Source Inverters for Renewable Energy Applications [#18900]*
Anish Ahmad and Rajeev Kumar Singh, Indian Institute of Technology (B.H.U.), Varanas, India

10:55AM *Utility Scale Interface for Renewables and Storage using a Power Electronic Transformer with Back-to-Back MMCs: A Novel Proposal and Control Scheme for Virtual Inertia [#19214]*
Vishnu Narayan Vipin, Abhijit Kshirsagar and Ned Mohan, University of Minnesota, United States

11:20AM *Control Architecture for Standalone Solar Photo-Voltaic Power Generation System [#18721]*
Dev Venkatramanan and Vinod John, Indian Institute of Science, Bangalore, India

11:45AM *An Isolated DC-AC Converter for Integrating Renewable Energy Source(RES) and Energy Storage(ES) for Three Phase Grid [#19667]*
Ritwik Chattopadhyay and Subhashish Bhattacharya, NC State University, United States

Power Converters for Transportation

Thursday, September 27, 10:30AM-12:10PM, Room: B111, Chair: Madhu Sudhan Chinthavali, Mehdi Ferdowsi

10:30AM *Current Control of Integrated Bi-directional Converter for V2G Based on Open Winding Interior PMSM [#18166]*
Jialou Gao, Wei Sun, Dong Jiang, Ronghai Qu and Qiao Li, Huazhong University of Science and Technology, China

10:55AM *Comparison and Control of Voltage Balancers for Bipolar DC Aircraft Power Systems [#18337]*
Luis Herrera, Mackenzie Lee, Murali Prasad and Bang-Hung Tsao, Rochester Institute of Technology, United States; University of Dayton Research Institute, United States

11:20AM *A Reconstructed Circuit Parameters Estimation Strategy of Modular Multiple Dual Active Bridge DC-DC Converters for Power Sharing Control [#19221]*
Nie Hou, Yunwei (Ryan) Li and Hao Tian, ECE, University of Alberta, Canada

11:45AM *Bi-directional Single-stage Interleaved Totem-pole AC-DC Converter with High frequency isolation for on-board EV Charger [#19312]*
Hamza Belkamel, Sangjin Kim, Byeongwoo Kim, Yangjin Shin and Sewan Choi, Seoultech, Korea (South); Seoulteh, Korea (South)

DC-AC single-phase 1

Thursday, September 27, 10:30AM-12:10PM, Room: C122, Chair: Xiaonan Lu, Regina Ramos Hortal

10:30AM *Single-Phase Bridge Inverter with Active Power Decoupling Based on Buck-Boost Converter [#18117]*
Shuang Xu, Liuchen Chang and Riming Shao, University of New Brunswick, Canada

10:55AM *A Soft-switched PWM Technique for a Single Stage Isolated DC-AC Converter with Synchronous Rectification [#18134]*
Parthasarathy Nayak, Sumit Kumar Pramanick and Kaushik Rajashekara, University of Houston, United States

11:20AM *Instantaneous Pulse Power Compensator for High-Power-Density Single-Phase Inverter [#18865]*
Xiaofeng Lyu, Yanchao Li, Ze Ni and Dong Cao, Navitas Semiconductor .Inc, United States; North Dakota State University, United States

11:45AM *The Phase-Controlled Class-D ZVS Inverter With Clamp Diodes [#19218]*
Yusuke Ishihara, Shohei Mita and Hiroo Sekiya, Chiba university, Japan; Chiba University, Japan

DC-AC multi-phase 1

Thursday, September 27, 10:30AM-12:10PM, Room: B119, Chair: Tom Cox, Shafiq Ahmed Odhano

10:30AM *Digital-Based Soft-Switching Modulation for High-Frequency Three-Phase Inverters with Reactive Power Transfer Capability [#19443]*
Zhengrong Huang, Qiang Li and Fred Lee, CPES, Virginia Tech, United States

10:55AM *Space Vector Modulation Technique for High Power Five-Level PCSI7 with DC Current Balance Control and Common-Mode Voltage Suppression [#19329]*
Jae Sung Park and Wang Jiacheng, Simon Fraser University, Canada

11:20AM *Performance Evaluation of A Bidirectional Three-Phase DC-AC Converter with Embedded DC-DC Converter and Carrier-Based PWM Strategy [#18045]*
Hongfei Wu, Jiangfeng Wang, Tingting Liu, Yan Xing and Peng Xu, Nanjing University of Aeronautics Astronautics, China

11:45AM *Reduction of DC-link Current Harmonics over Wide Power-Factor Range for Three-Phase VSI using Single-Carrier-Comparison Continuous PWM [#18716]*
Koroku Nishizawa, Jun-ichi Itoh, Satoru Fujita, Akihiro Odaka, Akio Toba and Hidetoshi Umida, Nagaoka University of Technology, Japan; Fuji Electric Co., Ltd., Japan

AC-DC single-phase 1

Thursday, September 27, 10:30AM-12:10PM, Room: C120, Chair: Minjie Chen, Pahlevani Majid

10:30AM *Accurate Variable On-time Control for CRM Flyback PFC Converters [#19011]*
Zhou Yuting, Ren Xiaoyong, Guo Zhehui, Chen Qianhong and Zhang Zhiliang, Nanjing Univ.of Aeronautics and Astronautics, China

10:55AM *Adaptive Harmonic Injection Mechanism for Single-Switch Three-Phase DCM Boost Rectifier [#18042]*
Ray-Lee Lin and Hung-I Cheng, National Cheng Kung University, Taiwan

11:20AM *A Single-Stage ZVS AC-DC Boost Converter With Interleaving [#18621]*
Adel Abosnina, Javad Khodabakhsh and Gerry Moschopoulos, Western University, Canada

11:45AM *A Unidirectional Converter Single-Phase AC-DC-AC Three-leg With Two-level and Three-level leg [#19170]*
Nustenil Segundo de Moraes Lima Marinus, Cursino Brandao Jacobina, Nady Rocha and Reuben Palmer Rezende Sousa, Federal Institute of Ceara, Brazil; Federal University of Campina Grande, Brazil; Federal University of Paraiba, Brazil

Modeling and Control of Resonant Converters

Thursday, September 27, 10:30AM-12:10PM, Room: A108, Chair: Gerry Moschopoulos, Juan Rivas Davila

10:30AM *Constant Burst Frequency Control for LLC Converters with Trajectory Control [#18824]*
Wei Jiang, Shuai Shao, Jianwei Wen, Xinke Wu and Junming Zhang, Zhejiang University, China

10:55AM *Accurate Small-signal Modeling of Resonant Converter Based on Perturbation on the State Plane [#19017]*
Yi-Hsun Hsieh and Fred C. Lee, Center for power electronics systems, Virginia T, United States

11:20AM *A wide output LLC converter based on full bridge and half bridge topology morphing method using trajectory transition [#18699]*
Jianwei Wen, Kuang Sheng, Wei Jiang, Junming Zhang and Shu Yang, Zhejiang University, China

11:45AM *Input Impedance Analysis of Charge Controlled and Frequency Controlled LLC Resonant Converter [#19571]*
Suyash Sushilkumar Shah, Utkarsh Raheja and Subhashish Bhattacharya, North Carolina State University, United States

Reliability, Diagnostic and Faults Analysis in Power Converters 1

Thursday, September 27, 10:30AM-12:10PM, Room: C121, Chair: Marco Liserre, Dong Dong

10:30AM *Simplified Estimation of the Junction Temperature Fluctuation at the Output Frequency of the Modular Multilevel Converter [#19057]*
Yi Zhang, Huai Wang, Zhongxu Wang and Frede Blaabjerg, Aalborg University, Denmark

10:55AM *An Enhanced Fault-Tolerant DC-DC Converter with Redundant Circuit and Topology Reconstruction [#18021]*
Guipeng Chen, Luan Chen, Zhufeng Jin, Yan Deng, Xinlin Qing and Huang Lantao, Xiamen University, China; Zhejiang University, China

11:20AM *Active Ageing Control of Winding Insulation in High Frequency Electric Drives [#19620]*
Riccardo Leuzzi, Vito Giuseppe Monopoli, Francesco Cupertino and Pericle Zanchetta, Politecnico di Bari, Italy; University of Nottingham, England

11:45AM *Non-Intrusive Online Stator Temperature Estimation for Open-End Winding PMSM [#19767]*
Nick Hunter, Tom Cox, Pericle Zanchetta and Shafiq Ahmed Odhano, The University Of Nottingham, United Kingdom

Model Predictive Control of Power Converters

Thursday, September 27, 10:30AM-12:10PM, Room: B116, Chair: Jose Rodriguez, Pericle Zanchetta

10:30AM *Modulated Optimal Model Predictive Control for Variable Speed Gen-Set [#19739]*
Luca Bigarelli, Shafiq Odhano, Alessandro Lidozzi, Fabio Crescimbini, Luca Solero and Pericle Zanchetta, C-PED, Roma Tre University, Italy; University of Nottingham, United Kingdom

10:55AM *MPC Using Modulated Optimal Voltage Vector for Voltage Source Inverter with LC Output Filter [#19228]*
Shafiq Ahmed Odhano, Pericle Zanchetta, Mi Tang and Cesar A. Silva, The University Of Nottingham, United Kingdom; The University of Nottingham, United Kingdom; Universidad Tecnica Federico Santa Maria, Chile

11:20AM *An Output-Bounded Model Predictive Control with Equivalently Variable Sampling Interval for Current-Source Converter [#18535]*
Hang Gao, Wu Bin, Dewei Xu and Navid Zargari, Dept. of ELCE, Ryerson Univerisity, Canada; Medium Voltage Drive, Rockwell Automation, Canada

11:45AM *Lyapunov-Based Model Predictive Control of Three-Phase Four-Leg Inverter with LC filter [#18925]*
Kazi Saiful Alam, Dan Xiao, Md. Parvez Akter, Daming Zhang and M. F. Rahman, University of New South Wales (UNSW), Australia

High Speed and Bearingless Motors 1

Thursday, September 27, 10:30AM-12:10PM, Room: B118, Chair: Junichi Asama, Wei Xu

10:30AM *Influence of Rotor Pole Thickness on Optimal Combination of Stator Slot and Rotor Pole Numbers in Integrated Flux-Switching Motor-Compressor [#19589]*
Hao Ding, Mingda Liu, Yingjie Li, William Sixel and Bulent Sarlioglu, University of Wisconsin - Madison, WEMPEC, United States

10:55AM *Integration of Suspension and Motor Windings for a Four-Phase Bearingless Motor [#19430]*
Junichi Asama, Tomotaka Shibata, Takaaki Oiwa and Akira Chiba, Shizuoka University, Japan; Tokyo Institute of Technology, Japan

11:20AM *Effects of Electrical Ageing on Winding Insulation in High-Speed Motors: Analysis and Modelling [#19619]*
Riccardo Leuzzi, Vito Giuseppe Monopoli, Francesco Cupertino and Pericle Zanchetta, Politecnico di Bari, Italy; University of Nottingham, England

11:45AM *Torque Density Improvement of Single-Drive Bearingless Motor [#18861]*
Theeraphong Srichiangsa, Hiroya Sugimoto and Akira Chiba, Tokyo Institute of Technology, Japan

IPM Motors 2

Thursday, September 27, 10:30AM-12:10PM, Room: B114, Chair: Takashi Kato, Rajesh Deodhar

10:30AM *Design Optimization of a Spoke-Type FSCW IPM Machine to Achieve High Torque Density and Low Torque Ripple under a Wide Constant Power Speed Range [#19541]*
Alireza Pouramin, Rukmi Dutta and M. Fuzlar Rahman, University of New South Wales, Australia

10:55AM *Torque Ripple Minimization in Interior Permanent Magnet Machines Using Axial Pole Shaping [#18251]*
Zhentao Du and Thomas Lipo, University of Wisconsin - Madison, United States

11:20AM *Performance Optimization of PMSM with Torque Ripple Reduction [#19045]*
Cristian A. Lopez and Elias G. Strangas, Michigan State University, United States

11:45AM *General magnetic model for the analysis and optimization of multiple barrier rotors [#19062]*
Giorgio Pietrini, Alessandro Soldati, Nicola Bianchi and Carlo Concari, University of Parma, Italy; University of Padova, Italy

Control Issues in PM Machines

Thursday, September 27, 10:30AM-12:10PM, Room: B115, Chair: Lei Hao, Fabio Giulii Capponi

10:30AM *Torque Ripple Minimization in Six-Step Modulated PMSM Drives via Fast DC Bus Dynamics [#18656]*
Hung-Yen Ou Yang and Robert Lorenz, WEMPEC Program, University of Wisconsin-Madison, United States

10:55AM *Current Control of Saturated Synchronous Motors [#18995]*
Hafiz Asad Ali Awan, Seppo E. Saarakkala and Marko Hinkkanen, Aalto University, Finland

11:20AM *Single-Phase Inverter Scheme for Permanent Magnet Synchronous Motor Drive with Resonant Capacitor [#19477]*
Kahyun Lee and Jung-Ik Ha, Seoul National University, Korea (South)

11:45AM *Analysis and Design of Position and Velocity Estimation Scheme for PM servo motor drive with Binary Hall Sensors [#18241]*
Qinan Ni, Ming Yang, Shafiq Odhano, Pericle Zanchetta, Xiaosheng Liu and Dianguo Xu, Harbin Institute of Technology, China; University of Nottingham, United Kingdom

Control Issues in Electric Drives 1

Thursday, September 27, 10:30AM-12:10PM, Room: B113, Chair: Marcello Pucci, Cupertino Francesco

10:30AM *5-Level PWM Scheme for a Dual Inverter Drive Using an Open Winding Machine [#19358]*
Chatumal Perera, Gregory J. Kish and John Salmon, University of Alberta, Canada

10:55AM *Three-phase Inverter Control for AC Motor Drives with Small DC-Link Capacitor fed by Single-phase Diode Rectifier [#18072]*
Kwak Byung-Gil and Jul-Ki Seok, Yeungnma University, Korea, Republic of

11:20AM *Harmonic Voltage Mitigation of Stand-Alone Brushless Doubly-Fed Induction Generator Feeding Nonlinear loads Considering Power Converter Rating [#18642]*
Kailiang Yu, Wei Xu, Yi Liu and Jianping Gao, State Key Laboratory of Advanced Electromagnetic, China

11:45AM *Fourth Harmonic Current Injection based Neutral Point Voltage Control Method for Three-Level Diode-Clamped Converter In Aircraft Starter Generator Systems [#18662]*
Chen Li, Tao Yang, Serhiy Bozhko and Patrick Wheeler, PEMC group, Nottingham University, United Kingdom

SiC characterization & modeling

Thursday, September 27, 10:30AM-12:10PM, Room: B112, Chair: Tanya Gachovska, Muhammad Nawaz

10:30AM *Characterization and Modeling of a SiC MOSFET's Turn-on Overvoltage [#18140]*
Wen Zhang, Zheyu Zhang, Fred Wang, Daniel Costinett, Leon Tolbert and Benjamin Blalock, University of Tennessee, United States

10:55AM *Characterization of the State-of-the-Art 1.2 kV SiC Power MOSFETs at Cryogenic Temperatures [#18190]*
Handong Gui, Ren Ren, Zheyu Zhang, Ruirui Chen, Jiahao Niu, Fred Wang, Leon M. Tolbert, Benjamin J. Blalock, Daniel Jes Costinett, Benjamin B. Choi and Gerald V. Brown, University of Tennessee, Knoxville, United States; NASA Glenn Research Center, United States

11:20AM *Comparison of Impedance Measurement Techniques for Extracting Parasitic Inductance of SiC MOSFETs [#18195]*
Tianjiao Liu, Yanjun Feng, Yuanfeng Zhou, Thomas T. Y. Wong and Z. John Shen, Illinois Institute of Technology, United States

11:45AM *Experimental and Modeling Comparison of Different Damping Techniques to Suppress Switching Oscillations of SiC MOSFETs [#18198]*
Tianjiao Liu, Yuanfeng Zhou, Yanjun Feng, Thomas T. Y. Wong and Z. John Shen, Illinois Institute of Technology, United States

Novel passive components
Thursday, September 27, 10:30AM-12:10PM, Room: B110, Chair: Shuo Wang, Huai Wang

10:30AM *A Passive Integrated Unit for Multi-Channel SRC LED Driver [#18353]*
Cheng Deng, Qiwen Jiang and Jiankun Lv, Xiangtan University, China

10:55AM *Planar Nonlinear Coupled Inductors for Improving Light Load Efficiency of DC/DC Converters [#18519]*
Laili Wang, Fei Li and Kangping Wang, Xi'an Jiaotong University, China

11:20AM *3D Printing and Reliability Testing of Pot-core Constant-flux Inductors [#18757]*
Chao Ding, Lanbing Liu, Jim Moss, Joyce Mullenix, Khai D.T. Ngo and Guo-Quan Lu, Virginia Tech, United States; Texas Instrument, United States

11:45AM *Design and Characterization of a Linear Controllable Capacitor [#18830]*
Lujie Zhang, Shashank Priya and Khai Ngo, CPES, Virginia Tech, United States; CEHMS, Virginia Tech, United States

Portable Applications
Thursday, September 27, 10:30AM-12:10PM, Room: A105, Chair: Dong Cao, Carl Ho

10:30AM *Lithium Ion Battery/ Lithium Ion Super Capacitor Hybrid Portable Power Energy Storage Device for Pulsed Power Applications [#19120]*
Kyle Waterman and Raymond Sepe, Jr, Electro Standards Laboratories, United States

10:55AM *A Flying Capacitor Multilevel Flyback Converter for Pulsed Power Applications [#18138]*
Santino Graziani, Ansel Barchowsky and Brandon Grainger, University of Pittsburgh, United States

11:20AM *A Temperature-suppression Charging Strategy for Supercapacitors of portable applications [#19378]*
Yongjie Liu, Zhiwu Huang, Hongtao Liao, Yanhui Zhou, Yun Jiao, Heng Li, Chao Hu and Jun Peng, Central South University, China

11:45AM *A Novel Intermittent Energy Capturing Method and Performance Analysis of Electromagnetic Energy Harvester for a Tire Application [#18467]*
Jiajun Ding, Hyunsung An and Hanju Cha, Chungnam National University, China; Chungnam National University, Korea (South)

Thursday, September 27, 2:10PM-3:50PM

Solar PV Converters II
Thursday, September 27, 2:10PM-3:50PM, Room: A107, Chair: Mohamed Badawy, Nuh Erdogan

2:10PM *Start-up scheme for dual-active-bridge based 10kV power electronics transformer in PV application [#18091]*
Tao Liu and Yang Xuan, Xian Jiaotong University, China

2:35PM *Small-Signal Modelling and Stability Study of a Single Stage Buck-Boost Inverter for PV Application [#18446]*
Ken King Man Siu and Carl Ngai Man Ho, University of Manitoba, Canada

3:00PM *Unfolding PV Microinverter Current Control: Rectified Sinusoidal vs Sinusoidal Reference Waveform [#19224]*
Diana Lopez, Samir Kouro, Freddy Flores and Ricardo Hernandez, Universidad Tecnica Federico Santa Maria, Ecuador; Universidad Tecnica Federico Santa Maria, Chile

3:25PM *Evaluation of 2.5 kV Silicon Carbide MOSFET for 1500V Solar Inverter Application [#19366]*
Xu She, Peter Losee and Rajib Datta, GE global research, United States

Grid Connected Converters- III

Thursday, September 27, 2:10PM-3:50PM, Room: B117, Chair: Mahshid Amirabadi, Siavash Pakdelian

2:10PM *A Unified Control Approach with Inherent Islanding and Synchronizing Capabilities for Grid Interfaced Inverters Operating in Autonomous Mode [#18169]*
Shan Shine and Umanand Loganathan, IISc, Bangalore, India

2:35PM *Remote Power Control Injection of Grid Connected Power Converters Based On Virtual Flux Approach [#18404]*
Nurul Fazlin Roslan, Alvaro Luna, Joan Rocabert, Jose Ignacio Candela and Pedro Rodriguez, Technical University of Catalonia, Spain; Loyola University of Andalucia, Spain

3:00PM *Self-Tuning of Triple-Loop Controlled Grid-Connected Inverters [#18755]*
Tommaso Caldognetto, Qing Liu and Simone Buso, University of Padova, Italy

3:25PM *Large-signal Model of Phase-locked-loop-based Synchronization of Grid Inverter [#18764]*
Zhi-Xiang Zou and Marco Liserre, University of Kiel, Germany

DC Circuit Breakers

Thursday, September 27, 2:10PM-3:50PM, Room: B111, Chair: Iqbal Husain, Qin Lei

2:10PM *A Modular Hybrid Circuit Breaker for Medium and High Voltage DC Networks [#18961]*
Jaganath Krishnan, Stefan Wettengel, Henry Gueldner, Rupp Juergen and Sebastian Nielebock, TU Dresden, Germany; Siemens AG, Germany

2:35PM *A Coupled Inductor based Hybrid Circuit Breaker Topology for Subsea HVDC Transmission Systems [#19043]*
Anindya Ray, Satish Naik Banavath, Sumit Kumar Pramanick and Kaushik Rajashekara, University of Houston, United States

3:00PM *Progressive Switching of Hybrid DC Circuit Breakers for Faster Fault Isolation [#19404]*
Landon Mackey, Chang Peng and Iqbal Husain, NC State University, United States

3:25PM *DC Circuit Breaker Fundamentals and introduction of a new concept to break DC circuits [#19568]*
Sudipta Sen, Shahab Mehraeen and Farzad Ferdowsi, Louisiana State University, United States

DC-AC single-phase 2

Thursday, September 27, 2:10PM-3:50PM, Room: B119, Chair: Mohammad B Shadmand, Ha Pham

2:10PM *A High Frequency Inverter for Variable Load Operation [#19531]*
Weston Braun and David Perreault, Massachusetts Institute of Technology, United States

2:35PM *Variable duty cycle approach to improve CCM Boundary range of Current-fed Switched Inverter with Modified PWM scheme [#19694]*
Anil Gambhir and Santanu Mishra, IIT Kanpur, India

3:00PM *Pulse Current Generator with Improved Waveform Fidelity for High Voltage Capacitively Coupled Plasma System [#19607]*
Beomseok Chae, Juhwa Min and Yongsug Suh, Chonbuk National University, Korea (South)

3:25PM *Cascaded Multilevel DC-AC Five-Leg Converter Topology Using Single-Phase Transformer and Single DC Source [#19107]*
Ayslan Caisson Noroes Maia, Cursino Brandao Jacobina and Antonio Marcus Nogueira Lima, Federal University of Campina Grande (UFCG), Brazil

DC-AC multi-phase 2

Thursday, September 27, 2:10PM-3:50PM, Room: C122, Chair: Giacomo Scelba, Lixiang Wei

2:10PM *A New Three-Level Three-Phase Boost PWM Inverter for PV applications [#18932]*
Aswin Palanisamy, Yam Siwakoti, Akshay Mahajan, Stephan Liese, Teng Long, Omid Forati Kashani and Frede Blaabjerg, Fraunhofer Institute of Solar Energy System, Germany; University of Technology Sydney, Australia; University of Cambridge, United Kingdom; Coburg University of Applied Sciences, Germany; Aalborg University, Denmark

2:35PM *Study of the Interaction between the AC and DC Side in the Quasi-Z-Source Convertor [#18258]*
Zipeng Liang, Mufeng Xiong, Sideng Hu and Xiangning He, zhejiang University, China; Zhejiang University, China

3:00PM *Bidirectional Transformerless EV Charging System with Low Device Cost and Leakage Current [#19542]*
Liwei Zhou and Matthias Preindl, Columbia University, United States

3:25PM *Capacitive-Link Universal Converters with Low Voltage Stress and High Switching Frequency [#18675]*
Mahshid Amirabadi and Masih Khodabendeh, Northeastern University, United States

AC-DC single-phase 2

Thursday, September 27, 2:10PM-3:50PM, Room: C120, Chair: Grant Pitel, Antonio J. Marques Cardoso

2:10PM *An Improved Zero Current Detection and Simplified Variable On-Time Control for CRM Boost PFC Converters [#18937]*
Yu Wu, Xiaoyong Ren, Zhehui Guo, Qianhong Chen and Zhiliang Zhang, Nanjing Univ. of Aeronautics and Astronautics, China

2:35PM *A Two-Stage AC-DC Converter with Delta-Sigma Configuration for Wide Output Voltage Range Applications [#18354]*
Gao Xun, Wu Hongfei, Li Mengxi and Xing Yan, Nanjing University of Aeronautics Astronautics, China

3:00PM *Analysis of Single-Phase High Power Factor SEPIC Rectifiers with Split-Capacitor Output [#18488]*
Paulo Costa, William Kremes, Carlos Illa Fon and Telles Lazzarin, Federal University of Santa Catarina, Brazil; Federal University of Technology Parana, Brazil

3:25PM *A Single-Step Bidirectional Switch Commutation Strategy for PWM Controlled AC/DC Resonant Converters [#19097]*
Kenny George and Simon Ang, University of Arkansas, United States

Modeling and Control of Multilevel Converters 2

Thursday, September 27, 2:10PM-3:50PM, Room: B116, Chair: Yongdong Li, Daniel Costinett

2:10PM *Zero sequences optimizing different criteria for three-phase multilevel inverters [#18917]*
Bernardo Cougo, Thierry Meynard, Guillaume Gateau and Lenin Morais, IRT Saint-Exupery, France; LAPLACE, France; UFMG, Brazil

2:35PM *Current Ripple Analysis and Prediction for Three-Level T-type Converters [#19532]*
Zhongjing Wang and Yue Zhao, University of Arkansas, United States

3:00PM *Feed-forward Control of Active Voltage Balancing Converter in Electric Drive with Five-Level NPC Converters [#19244]*
Georgios Mademlis and Yujing Liu, Chalmers University of Technology, Sweden

3:25PM *FPGA control of a Three-Phase Three-Level T-Type NPC Grid-Connected Inverter with LCL Filter [#18731]*
Chin-Chang Kuo and Ying-Yu Tzou, National Chiao Tung University, Taiwan

Reliability, Diagnostic and Faults Analysis in Power Converters 2

Thursday, September 27, 2:10PM-3:50PM, Room: A108, Chair: Huai Wang, Lee Empringham

2:10PM *Active Reliability Assessment of GaN-based Power Converters [#19529]*
Mehrdad Biglarbegian and Babak Parkhideh, University of North Carolina at Charlotte, United States

2:35PM *Control of a Three-phase Boost Rectifier for Operation Under Single Failure of the AC Line For Avionic Application [#18818]*
Uros Borovic, Sisi Zhao, Pedro Alou, Jesus Angel Oliver and Jose Antonio Cobos, Universidad Politecnica de Madrid, Spain

3:00PM *Reliability Assessment of PV Inverters with Battery Systems Considering PV Self-Consumption and Battery Sizing [#18377]*
Ariya Sangwongwanich, Sebastian Zurmuehlen, Georg Angenendt, Yongheng Yang, Dezso Sera, Dirk Uwe Sauer and Frede Blaabjerg, Aalborg University, Denmark; RWTH Aachen University, Germany

3:25PM *IoT-based Prognostics and Health Management for Self-Healing Power Converters [#18836]*
Anderson Rocha, Bruno Carvalho, Alysson Augusto, Victor Ferreira, Danilo Melo and Braz Cardoso, CEFET-MG, Brazil; UFMG, Brazil

Modelling and Analysis Methods 2

Thursday, September 27, 2:10PM-3:50PM, Room: B114, Chair: Katsumi Yamazaki, Mohammad Rasouli

2:10PM *A Fast Solution of Rotor Losses in Inverter-Fed Cage Induction Motors with Skewed Slots [#18069]*
Yang Zhan, Tao Wang, Haisen Zhao, Guorui Xu and Dongdong Zhang, North China Electric Power University, China; Xi'an Jiaotong University, China

2:35PM *Analysis of Airgap Field Modulation Principle of Flux Guides [#18071]*
Honghui Wen, Ming Cheng, Peng Han, Yunlei Jiang and Minghao Tong, Southeast University, China

3:00PM *An Efficient Approach for Measurement-Based Composite Load Modeling [#19380]*
Mohammad Rasouli, Reza Sabzehgar and Hamid Reza Teymour, Penn State Behrend, United States; San Diego State University, United States; Jabil Circuit, United States

3:25PM *Analytical Modeling of a Segmented Pole Synchronous Reluctance Machine with CRGO Laminations [#18082]*
Seyede Sara Maroufian and Pragasen Pillay, Concordia University, Canada

Axial Flux and Special Machines

Thursday, September 27, 2:10PM-3:50PM, Room: B118, Chair: Giulio De Donato, Tausif Husain

2:10PM *Influences of Manufacturing Tolerance on Performance of Axial Flux-Switching Permanent Magnet Machine [#19087]*
Ju Hyung Kim and Bulent Sarlioglu, University of Wisconsin-Madison, United States

2:35PM *Effect of Pole Shaping on Cogging Torque and Torque Ripple in Consequent Pole TFM [#19682]*
Iftekhar Hasan and Yilmaz Sozer, University of Akron, United States

3:00PM *Torque Production Capability of Axial Flux Machines with Single and Double Rotor Configurations [#19583]*
Narges Taran, Greg Heins, Vandana Rallabandi, Dean Patterson and Dan M. Ionel, University of Kentucky, United States; Regal Beloit Corporation, Australia

3:25PM *Basic Characteristics of a Magnetic Resonance-Coupling Machine with Various Numbers of Poles for Ultra-lightweight [#18375]*
Kazuto Sakai and Kenta Takishima, Toyo University, Japan

Control of Electric Generators

Thursday, September 27, 2:10PM-3:50PM, Room: B113, Chair: Maurizio Cirrincione, Shafiq Ahmed Odhano

2:10PM *Harmonic Voltage and Current Elimination of Stand-Alone Brushless Doubly-Fed Induction Generator with Nonlinear Loads for Ship Shaft Power Generation Applications [#19025]*
Yi Liu, Wei Xu, Frede Blaabjerg and Hu Dong, Huazhong University of Science and Technology, China; Aalborg University, Denmark

2:35PM *Parametric Study for the Design of the End Region of Large Synchronous Generators Based on Three-Dimensional Transient Finite Element Analysis [#19512]*
Sufei Li, Cheng Gong, J. Rhett Mayor, Ronald G. Harley and Thomas G. Habetler, Georgia Institute of Technology, United States

3:00PM *Full-Size Converter Operation of Large Hydro Power Generators: Generator Design Aspects [#18390]*
Thomas Holzer and Annette Muetze, Graz University of Technology, Austria

3:25PM *Control Design of Stand-alone Brushless Double-fed Induction Generator for Supplying Unbalanced Loads [#18273]*
Omer Mohammed Elbabo Mohammed, Wei Xu and Yi Liu, Huazhong University of Science and Technology, Sudan; Huazhong University of Science and Technology, China

Modeling & optimization in power converters

Thursday, September 27, 2:10PM-3:50PM, Room: B110, Chair: Dehong Mark Xu, Martin Ordonez

2:10PM *Equivalent parameters of round and litz wire conductors to obtain an equivalent layer to accelerate Finite Element simulations of wireless power transfer systems [#18970]*
Alberto Delgado, Guillermo Salinas, Jesus A. Oliver, Jose A. Cobos, Miroslav Vasic and Jorge Rodriguez, Universidad Politecnica de Madrid, Spain; PREMO S.L., Spain

2:35PM *Fast Finite Element Thermal Simulation of Magnetic Components by the Use of Winding Equivalent Layers [#19054]*
Guillermo Salinas, Alberto Delgado, Jesus A. Oliver and Roberto Prieto, Universidad Politecnica de Madrid, Spain

3:00PM *Reliability Evaluation and Optimization of Capacitor Bank [#19086]*
Haoran Wang and Huai Wang, Aalborg University, Denmark

3:25PM *Experimentally extracting multiple spatial thermal models that accurately capture slow and fast properties of assembled power semiconductor converter systems [#19179]*
Timothy Polom, Markus Andresen, Marco Liserre and Robert Lorenz, University of Wisconsin-Madison, United States; University of Kiel, Germany, German