Technical Program Schedule – Poster Sessions

Monday, September 15 - 5:00 pm - 6:30 pm

EAST

Poster Session: Control Aspects in Smart Grids
Room: Exhibit Hall C - East
Chair: Qin Lei, Omer Onar

P101 - Inverter Power Control to Support Distribution System Voltage Variability Mitigation
Xiao Liu, Aaron M. Cramer, University of Kentucky, United States

P102 - A Unified Controller for a Microgrid based on Adaptive Virtual Impedance and Conductance
Meiqin Mao, Zheng Dong, Yong Ding, Liuchen Chang, Hefei University of Technology, China; University of New Brunswick, Canada

P103 - Small Signal Impedance Measurement in Droop Controlled AC Microgrids
Malte John, Patricio A. Mendoza-Araya, Giri Venkataramanan, Leibniz Universität Hannover, Germany; University of Chile, Chile; University of Wisconsin-Madison, United States

P104 - Series-Connected HV-IGBTs using Active Voltage Control with Status Feedback Circuit
Shiqi Ji, Ting Lu, Zhengming Zhao, Hualong Yu, Liqiang Yuan, Tsinghua University, China

P105 - Independent Damping Control of Multimode Low-Frequency Oscillations using Shunt-Connected FACTS Devices in Power System
Mebtu Beza, Massimo Bongiorno, Chalmers University of Technology, Sweden

P106 - The Improved Sen Transformer – A New Effective Approach to Power Transmission Control
Jiaxin Yuan, Li Chen, Baichao Chen, Wuhan University, China

P107 - Independent Real and Reactive Power Flow Control without Sensing Receiving End Voltage in Transformer-Less Unified Power Flow Controller
Deepak Gunasekaran, Shao Zhang, Shuitao Yang, Fang Zheng Peng, Michigan State University, United States

P108 - A Line Impedance Conditioner to Improve Zigzag Transformer based Hybrid AC/DC Transmission under Unbalanced Line Impedance Conditions
Bo Liu, Xiaojie Shi, Fred Wang, Yalong Li, University of Tennessee, Knoxville, United States

P109 - Multi-Terminal DC Grid Control under Loss of Terminal Station
Nima Yousefpoor, Sungmin Kim, Subhashish Bhattacharya, Quanta Technology, United States; Seoul National University, Korea; North Carolina State University, United States

P110 - Control Concept Including Validation Strategy for an AC/DC Hybrid Link (Ultranet)
Volker Staudt, Andreas Steimel, Michael Kohlmann, Martin Kleine Jäger, Carsten Heising, Daniel Meyer, Klaus Vennemann, Eckhard Grebe, Klaus Kleinekorte, Ruhr-University Bochum, Germany; Avasition, Germany; Amprion, Germany

P111 - Suppression Strategy for Short-Circuit Current in Loop-Type DC Microgrid
Xiaoming Zha, Han Ning, Xiaoli Lai, Ying Huang, Fei Liu, Wuhan University, China
P112 - Cost-based Droop Scheme for DC Microgrid  
Inam Ullah Nutkani, Wang Peng, Poh Chiang Loh, Frede Blaabjerg, Nanyang Technological University, Singapore; Aalborg University, Denmark

P113 - Droop Voltage Range Design in DC Micro-Grids Considering Cable Resistance  
Fang Chen, Wei Zhang, Rolando Burgos, Dushan Boroyevich, Virginia Polytechnic Institute and State University, United States

P114 - Flexible Power Flow Control for Next-Generation Multi-Terminal DC Power Network  
Kenji Natori, Hidemine Obara, Kouhei Yoshikawa, Bao Cong Hiu, Yukihiko Sato, Chiba University, Japan

P115 - Robust Control of a Single-Phase VSI with LCL Filter for Grid-Tie and Islanded Operation Modes Applied to PV Distributed Generation in Microgrids Environment  
José C.U. Peña, Guilherme Melo, Carlos A. Canesin, Leonardo P. Sampaio, Sã o Paulo State University, Brazil; Federal Technological University of Paraná, Brazil

P116 - Average Modeling of a Three-Phase Inverter for Integration in a Microgrid  
Zeljko Jankovic, Bora Novakovic, Vijay Bhavaraju, Adel Nasiri, University of Wisconsin-Milwaukee, United States; Eaton Corporation, United States

P117 - Optimization of the Maximum Power Point Tracking Method for Peak-Current Controlled Flyback Micro-Inverter  
Zhe Zhang, Wang Chen, Min Chen, Zhejiang University, China

P118 - Implementation of LVRT Techniques of Grid-Connected PCS with the Adaptive Low Pass Notch PLL Method  
Dong-sul Shin, Jong-Pil Lee, Kyung-Jun Lee, Tae-Jin Kim, Dong-Wook Yoo, Pusan National University, Korea; KERI, Korea

P119 - Sub-Synchronous Resonance Analysis in DFIG-based Wind Farms: Definitions and Problem Identification – Part I  
Hossein Ali Mohammadpour, Enrico Santi, University of South Carolina, United States

P120 - 8-Shaped Trajectory Control for Rugged Rural PV Inverters  
Juan M. Galvez, Martin Ordonez, University of British Columbia, Canada

P121 - Management of the Wind Turbine Energy Delivered to the Grid based on the Flatness Control Method  
Merzak Aimene, Alireza Payman, Brayima Dakyo, University of Le Havre, France

Poster Session: Transportation  
Room: Exhibit Hall C - East  
Chair: Jiaqi Liang, Burak Ozpineci

P301 - Parameter Identification of Wireless Power Transfer Systems using Input Voltage and Current  
Deyan Lin, Jian Yin, S.Y. Ron Hui, University of Hong Kong, Hong Kong

P302 - Efficiency Improvement and Evaluation of Floating Capacitor Open-Winding PM Motor Drive for EV Application
Di Pan, Kum-Kang Huh, Thomas A. Lipo, GE Global Research, United States; University of Wisconsin-Madison, United States

**P303 - Reducing the Impact of Source Internal Resistance by Source Coil in Resonant Wireless Power Transfer**
Yiming Zhang, Ting Lu, Zhengming Zhao, Tsinghua University, China

**P304 - Analysis and Design of a Class D Rectifier for a Class E Driven Wireless Power Transfer System**
Patrick C.K. Luk, Samer Aldhaher, Cranfield University, United Kingdom

**P305 - 7M-Off-Long-Distance Extremely Loosely Coupled Inductive Power Transfer Systems using Dipole Coils**
Bo H. Choi, Eun S. Lee, Ji H. Kim, Chun T. Rim, KAIST, Korea

**P306 - Evolutionary Multi-Objective Optimization of H∞ Controller for Inductive Power Transfer System**
Xin Dai, Yang Zou, Yue Sun, Zhihui Wang, Chunsen Tang, Aiguo Patrick Hu, Chongqing University, China; University of Auckland, New Zealand

**P307 - A Resonant Compensation Method for Improving the Performance of Capacitively Coupled Power Transfer System**
Liang Huang, Aiguo Patrick Hu, Akshya Swain, University of Auckland, New Zealand

**P308 - Optimization of Foil Conductor Layout in Inductive Power Transfer System Resonators**
Mohammad Etemadrezaei, Srđjan M. Lukic, North Carolina State University, United States

**P309 - Analysis, Design and Implementation of Phase-Shifted Series Resonant High-Voltage Capacitor Charging Power Supply and its Fuzzy Logic Controller**
Lei Lin, Heging Zhong, Yu Deng, Yongfu Liao, Ao Li, Yu Chen, Li Peng, Huazhong University of Science and Technology, China

**P310 - Hundreds kW Charging Stations for e-Buses Operating under Regular Ultra-Fast Charging**
Júlio C.G. Justino, Thiago M. Parreiras, Braz de J. Cardoso Filho, Federal University of Minas Gerais, Brazil

**P311 - Battery Management System with Cell Equalizer for Multi-Cell Battery Packs**
Giovanna Oriti, Alexander L. Julian, Peter Norgaard, Naval Postgraduate School, United States; United States Navy, United States

**P312 - Cell Selection through Two-Level Basis Pattern Recognition with Low/High Frequency Components Decomposed by DWT-based MRA**
Jonghoon Kim, Chosun University, Korea

**P313 - Tethered Aerial Robots using Contactless Power Systems for Extended Mission Time and Range**
Su Y. Choi, Bo H. Choi, Seog Y. Jung, Beom W. Gu, Seung J. Yoo, Chun T. Rim, KAIST, Korea

**P314 - Variable Frequency Generation System for Aircraft**
Denis Makarov, Sergey Kharitonov, Gennadiy Zinoviev, Dmitriy Korobkov, Andrey Sidorov, Novosibirsk State Technical University, Russian

**P315 - High Power Density SRC for Low Voltage Battery Charger in xEV with Third Harmonic Operation Technique**
Jung-Hoon Ahn, Dong-Hee Kim, Won-Yong Sung, Seung-Hee Ryu, Byoung-Kuk Lee, Sungkyunkwan University, Korea
Poster Session: Non-Isolated DC-DC Converters
Room: Exhibit Hall C - North
Chair: Gui-Jia Su

P501 - Further Reduction of Switching Loss for the Lossless Snubber based Converters
Beibei Wang, Trillion Q. Zheng, Jiepin Zhang, Beijing Jiaotong University, China

P502 - Voltage Controlled Variable Capacitor based Snubber for the Reduction of IGBT's Turn-Off Loss
Beibei Wang, Trillion Q. Zheng, Jiepin Zhang, Beijing Jiaotong University, China

P503 - A Quasi-Z-Source DC-DC Converter
LiQiang Yang, Dongyuan Qiu, Bo Zhang, GuiDong Zhang, Wenxun Xiao, South China University of Technology, China

P504 - Power Semiconductor Filter: Use of Series-Pass Device in Switching Converters for Input Filtering
Wing-to Fan, Kuen-faat Yuen, Henry Shu-hung Chung, City University of Hong Kong, Hong Kong

P505 - Master-Slave Technique with Direct Variable Frequency Control for Interleaved Bidirectional Boost Converter
A. Vazquez, M. Arias, A. Rodriguez, D.G. Lamar, S. Luri, University of Oviedo, Spain; IK4-IKERLAN, Spain

P506 - Design of a 2 MW DC Supply using a 4-Stage Interleaved DC-DC Converter
Yusi Liu, Chris Farnell, Juan Carlos Balda, H. Alan Mantooth, University of Arkansas, United States

P507 - 3D Printed Air Core Inductors for High Frequency Power Converters
Wei Liang, Luke Raymond, Juan Rivas, Stanford University, United States

P508 - Inductor Loss Analysis of Various Materials in Interleaved Boost Converters
Yuki Itoh, Shota Kimura, Jun Imaoka, Masayoshi Yamamoto, Shimane University, Japan

P509 - Voltage Balancing in an Interleaved High Gain Boost Converter
Jesús E. Valdez-Reséndiz, Abraham Claudio-Sánchez, Gerardo V. Guerrero-Ramírez, Alejandro Tapia-Hernández, Aldo N. Higuera Juárez, Adolfo R. López Núñez, Centro Nacional de Investigación y Desarrollo Tecnológico, Mexico

Poster Session: Multi-Phase Converters
Room: Exhibit Hall C - North
Chair: Jiangang Hu

P701 - Virtual-Flux-based Power Predictive Control of Three-Phase PWM Rectifiers using Space-Vector Modulation
Yongsoo Cho, Kyo-Beum Lee, Ajou University, Korea

P702 - Zero Sequence Blocking Transformers for Multi-Pulse Rectifier in Aerospace Applications
Wenli Yao, Frede Blaabjerg, Xiaobin Zhang, Yongheng Yang, Zhaohui Gao, Northwest Polytechnical University, China; Aalborg University, Denmark
P703 - A Novel Three-Phase Current Source Rectifier with Delta-Type Input Connection to Reduce Device Conduction Loss
Ben Guo, Fred Wang, Eddy Aeloiza, University of Tennessee, United States; ABB Corporate Research, United States

P704 - Active Front End Rectifier Design Trade-Off between PWM and Direct Power Control Method
Lixiang Wei, Yogesh Patel, Murthy Csn, Rockwell Automation, United States; L&T Technology, United States

P705 - Three-Phase Four-Switch Partial Resonant Soft Switched Rectifier
Ankan De, Subhashish Bhattacharya, North Carolina State University, United States

P706 - Control Strategy of PV Inverter under Unbalanced Grid Voltage Sag
Huang Hao, Xu Yonghai, North China Electric Power University, China

P707 - Pulsed-Width Modulation Technique for Family of (3N+3)-Switch Converters
Kennedy A. Aganah, Olorunfemi Ojo, Tuskegee University, United States; Tennessee Technological University, United States

P708 - Modeling of Voltage Source Inverter having Active Split DC-Bus for Supply of Four-Wire Electrical Utility Systems
Alessandro Lidozzi, Giovanni Lo Caizo, Sabino Pipolo, Luca Solero, Fabio Crescimbini, Roma Tre University, Italy

P709 - High Reliability Capacitor Bank Design for Modular Multilevel Converter in MV Applications
Vahid Najmi, Jun Wang, Rolando Burgos, Dushan Boroyevich, Virginia Polytechnic Institute and State University, United States

P710 - Model Predictive Control of a Direct Three-to-Seven Phase Matrix Converter
Sk Moin Ahmed, Haitham Abu-Rub, Zainal Salam, Texas A&M University at Qatar, Qatar; University Technology Malaysia, Malaysia

Xuyang You, Baoming Ge, Shuo Liu, Xinjian Jiang, Haitham Abu-Rub, Fang Z. Peng, Beijing Jiaotong University, China; Texas A&M University, United States; Tsinghua University, China; Texas A&M University at Qatar, Qatar; Michigan State University, United States

P712 - A Novel Medium-Frequency-Transformer Isolated Matrix Converter for Wind Power Conversion Applications
Chunyang Gu, Harish S. Krishnamoorthy, Prasad N. Enjeti, Yongdong Li, Tsinghua University, China; Texas A&M University, United States

P713 - Novel Matrix Converter Topologies with Reduced Transistor Count
S.M. Sajjad Hossain Rafin, Thomas A. Lipo, Byung-il Kwon, Hanyang University, Korea; University of Wisconsin-Madison, United States

P714 - Control of AC-Capacitor Clamped Three and Five Level Matrix Converter using Voltage and Current Modulation
Lin Qiu, Lie Xu, Yongdong Li, Tsinghua University, China
**Poster Session: DC-DC Converters**
*Room: Exhibit Hall C - South*
*Chair: Lixiang Wei, Brian Welchko*

**P901 - A Digital Predictive Current Mode Controller using Average Inductor Current**  
Siyu He, John Y. Hung, Robert M. Nelms, Auburn University, United States

**P902 - Phase-Shift Control of Isolated Bidirectional DC-DC Converters for Unidirectional Power Flow**  
Junjie Ge, Zhengming Zhao, Junchao Ma, Fanbo He, Liqiang Yuan, Ting Lu, Tsinghua University, China

**P903 - Auto-Tuning and Self-Calibration Techniques for V2 Control with Capacitor Current Ramp Compensation using Lossless Capacitor Current Sensing**  
Pei-hsin Liu, Yingyi Yan, Fred C. Lee, Qiang Li, Virginia Polytechnic Institute and State University, United States; Linear Technology, United States

**P904 - Band Separation in Linear-Assisted Switching Power Amplifiers for Accurate Wide-Bandwidth Envelope Tracking**  
Dongxue Li, Yuanzhe Zhang, Miguel Rodríguez, Dragan Maksimović, University of Colorado-Boulder, United States

**P905 - Modeling and State-Space Feedback Control of a DC-DC Converter for Photovoltaic Systems**  
Darlan A. Fernandes, Márcia K. Vieira, Montiê A. Vitorino, Fabiano Fragoso Costa, Polnyana C. Ribeiro, Federal University of Paraiba, Brazil; Federal University of Campina Grande, Brazil; Federal University of Bahia, Brazil

**P906 - Stability and Accuracy Considerations in the Design and Implementation of a Kilowatt-Scale DC Power Hardware-in-the-Loop Platform**  
Jonathan Siegers, Herbert L. Ginn, Enrico Santi, University of South Carolina, United States

**P907 - A Method to Measure the DC bias in High Frequency Isolation Transformer of the Dual Active Bridge DC to DC Converter and its Removal using Current Injection and PWM Switching**  
Sumit Dutta, Subhashish Bhattacharya, North Carolina State University, United States

**P908 - Fault Diagnosis in Unidirectional Non-Isolated DC-DC Converters**  
E. Ribeiro, A.J. Marques Cardoso, C. Boccaletti, University of Beira Interior, Portugal; Sapienza University of Rome, Italy

**Poster Session: DC-AC and DC-AC Converters**
*Room: Exhibit Hall C - South*
*Chair: Lixiang Wei, Brian Welchko*

**P1101 - Parameter Design of the Three-Phase Four-Wire Testing Platform for New Energy Grid Connected Devices based on PRR Controller**  
Shuang Zhao, Fei Liu, Zha Xiaoming, Sun Jianjun, Hu Wei, Wuhan University, China

**P1102 - Nonlinear Feedback Control of Compound Active-Clamp Soft-Switching Three-Phase PFC Converter based on Load Observer**  
Xin Guo, Hai-Peng Ren, Xi'an University of Technology, China

**P1103 - Second Harmonic Current Reduction and Dynamic Performance Improvement in the Two-Stage Inverter: An Output Impedance Perspective**  
Li Zhang, Xinbo Ruan, Xiaoyong Ren, Nanjing University of Aeronautics and Astronautics, China
P1104 - Stationary Frame Control Strategy for Voltage Source Inverter under Unbalanced and Distorted Grid Voltage
Yipeng Song, Heng Nian, Zhejiang University, China

P1105 - Model Predictive Control of Nested Neutral Point Clamped (NNPC) Converter
Mehdi Narimani, Venkata Yaramasu, Bin Wu, George Cheng, Navid Zargari, Ryerson University, Canada; Rockwell Automation, Canada

P1106 - Power Loss Benchmark of Nine-Switch Converters in Three-phase Online-UPS Application
Zian Qin, Poh Chiang Loh, Frede Blaabjerg, Aalborg University, Denmark

P1107 - A New Control Method for Minimizing the DC-Link Capacitor Current of HEV Inverter Systems
Christian Sommer, Arvid Merkert, Axel Mertens, Leibniz Universität Hannover, Germany

P1108 - Resonant-Inductor-Voltage-Feedback Active Damping based Control for Grid-Connected Inverters with LLCL-Filters
Min Huang, Xiongfei Wang, Poh Chiang Loh, Frede Blaabjerg, Aalborg University, Denmark

Poster Session: Control of Power Converters
Room: Exhibit Hall C - South
Chair: Lixiang Wei, Brian Welchko

P1301 - Decentralized Voltage Sharing Control Strategy for Fully Modular Input-Series Output-Series High-Voltage System
Guangjiang Wang, Wu Chen, Yong Ke, Wei Jiang, Southeast University, China; WuHu Profession and Technology College, China

P1302 - A Novel Input Voltage Sharing Control Strategy for Input-Series Output-Parallel System with High Reliability
Wu Chen, Xu Zhu, Guangjiang Wang, Wei Jiang, Kai Yao, Southeast University, China; Nanjing University of Science and Technology, China

P1303 - Implementation of H∞ Controller for Active Voltage Quality Regulator under Distorted Grid
Yong Lu, Guochun Xiao, Xuanlv Wu, Lifu Zheng, Jinjun Liu, Le Sun, Xi'an Jiaotong University, China

P1304 - Active Damping for Model Predictive Pulse Pattern Control
Peter Hokayem, Tobias Geyer, Nikolaos Oikonomou, ABB Corporate Research Center, Switzerland

P1305 - High Efficiency and Total Harmonic Distortion Improvement by Zero Current Prediction Technique for Transformer-Free Buck Power Factor Corrector
Che-Hao Meng, Chih-Wei Chang, Chao-Chang Chiu, Ke-Horng Chen, Ying-Hsi Lin, Tsung-Yen Tsai, Chao-Cheng Lee, National Chiao Tung University, Taiwan; Realtek Semiconductor Corp., Taiwan

P1306 - Variable-Speed IGBT Gate Driver with Loss/Overshoot Balancing for Switching Loss Reduction
Alexey Sokolov, Diego Mascarella, Geza Joos, McGill University, Canada

P1307 - New Current Control Scheme for the Vienna Rectifier in Discontinuous Conduction Mode
Michael Leibl, Johann W. Kolar, Josef Deuringer, ETH Zurich, Switzerland; Siemens AG Healthcare, Germany
**P1308 - Synchronous Frame and Resonant Adaptive Observers as Disturbance Estimators and their Applications in Power Electronics**  
Vlatko Miskovic, Vladimir Blasko, Thomas M. Jahns, Robert D. Lorenz, Charles J. Romenesko, Haojiong Zhang, Danfoss Power Electronics, United States; University of Wisconsin-Madison, United States; United Technologies Research Center, United States

**P1309 - Sliding Mode Controlled Half Bridge Audio Amplifier using Single Power Supply**  
Sridhar Joshi, Parthasarathi Sensarma, Indian Institute of Technology Kanpur, India

---

**Poster Session: General Topics**  
**Room: Exhibit Hall C - South**  
**Chair: Peng Zhang**

**P1501 - Reconsideration of Loop Gain Measurement of DC/DC Converters**  
Chun Xiong, Xinbo Ruan, Peilin Chen, Xuehua Wang, Huazhong University of Science and Technology, China

**P1502 - Simplified Electric Vehicle Models for use in Undergraduate Teaching and Research**  
John G. Hayes, University College Cork, Ireland

**P1503 - AC/DC Converters with Open-End Grid for AC Machine Conversion Systems**  
João P.R.A. Méllo, Cursino B. Jacobina, Gregory A.A. Carlos, Nady Rocha, Federal University of Campina Grande, Brazil; Federal Institute of Alagoas, Brazil; Federal University of Paraíba, Brazil

**P1504 - Energy Saving HVAC System Modeling and Closed Loop Control in Industrial and Commercial Adjustable Speed Drives**  
Kevin Lee, Ravishankar Rugge, Kyle Zheng, Bing Yang, Eaton Corporation, United States

---

**WEST**

**Poster Session: Induction Machines**  
**Room: Exhibit Hall C - West**  
**Chair: Galina Mirzaeva**

**P1701 - Maximum Efficiency per Torque Direct Flux Vector Control of Induction Motor Drives**  
S.A. Odhano, R. Bajoi, A. Boglietti, S.G. Rosu, G. Griva, Politecnico di Torino, Italy; University "Politehnica" of Bucharest, Romania

**P1702 - Electric Circuit Coupling of a Slotted Semi-Analytical Model for Induction Motors based on Harmonic Modeling**  

**P1703 - Soft Start and Voltage Control of Grid Connected Induction Motors using Floating Capacitor H-Bridge Converters**  
S. Leng, R. Ul Haque, N. Perera, A. Knight, J. Salmon, University of Alberta, Canada; University of Calgary, Canada

**P1704 - Modeling and Parameter Estimation of Split-Single Phase Induction Motors**  
Burak Tekgun, Yilmaz Sozer, Igor Tsukerman, University of Akron, United States
P1705 - Thermal Design of High Power-Density Additively-Manufactured Induction Motor
Ram Ranjan, Jagadeesh Tangudu, United Technologies Research Center, United States

P1706 - Dynamics and Vector Control of Wound-Rotor Brushless Doubly Fed Induction Machines
Zhentao S. Du, Thomas A. Lipo, University of Wisconsin-Madison, United States

P1707 - The Doubly-Fed Induction Machine as an Aero Generator
Tom Feehally, Judith Apsley, University of Manchester, United Kingdom

P1708 - Start-Up Problem with an Induction Machine and a Permanent Magnet Gear
T.V. Frandsen, N.I. Berg, R.K. Holm, P.O. Rasmussen, Aalborg University, Denmark

Poster Session: Reluctance Machines
Room: Exhibit Hall C - West
Chair: Wen Ouyang

P1901 - Power Converter Rating for Switched Reluctance Motors
Howard C. Lovatt, CSIRO, Australia

P1902 - Control of Switched Reluctance Generators in Continuous Conduction Mode
W.U. Nuwantha Fernando, RMIT University, Australia

P1903 - Torque Ripple Minimization of Switched Reluctance Motors through Speed Signal Processing
Rakesh Mitra, Yilmaz Sozer, University of Akron, United States

P1904 - Synchronous Reluctance Motors with Toroidal Windings
Christopher Spargo, Barrie Mecrow, James Widmer, Newcastle University, United Kingdom

P1905 - Vector Control for Switched Reluctance Motor Drives using an Improved Current Controller
Noriya Nakao, Kan Akatsu, Shibaura Institute of Technology, Japan

P1906 - Magnetic Design of Two-Phase Switched Reluctance Motor with Bi-DIRECTIONAL Startup Capability
Lei Gu, Adam Clark, Wei Wang, Joseph Hearron, Babak Fahimi, University of Texas at Dallas, United States

P1907 - Design of a Synchronous Reluctance Motor with Non-Overlapping Fractional-Slot Concentrated Windings
Christopher Spargo, Barrie Mecrow, James Widmer, Newcastle University, United Kingdom

P1908 - Two Converter based Operation of a Brushless Doubly Fed Reluctance Machine
Ronald S. Rebeiro, Andrew M. Knight, University of Calgary, Canada

P1909 - Design Considerations for Reduction of Acoustic Noise in Switched Reluctance Drives
Chenjie Lin, Babak Fahimi, University of Texas at Dallas, United States

P1910 - Static Modeling of the Ultra High Speed Machine Rotor
B. Suttles, J. Mayor, A. Semidey, Georgia Institute of Technology, United States

Poster Session: Other Topics in Electrical Machines
Room: Exhibit Hall C - West
Chair: Dan Ionel

P2101 - A Magnetic Gearbox with an Active Region Torque Density of 239Nm/L
K.K. Uppalapat, J.Z. Bird, J. Wright, J. Pritchard, M. Calvin, W. Williams, University of North Carolina at Charlotte, United States

P2102 - Harmonics in Rotating Transformer Exciting Systems for Turbine Generators
Stefan Schmuelling, Christoph Schmuelling, Stefan Habel, TU Dortmund University, Germany

P2103 - 3-D Modeling of Shielding of Magnetic Stray Fields based on Superposition of 2-D Models
K.J.W. Pluk, J.W. Jansen, E.A. Lomonova, Eindhoven University of Technology, Netherlands

P2104 - Influences of CO2 and FKL-Laser Cutting as well as Mechanical Cutting on the Magnetic Properties of Electric Steel Sheet S Determined by Epstein Frame and Stator Lamination Stack Measurements
Madeleine Bali, Annette Muetze, Graz University of Technology, Austria

P2105 - Numerical Magnetic Property Evaluation in Consideration of Power Semiconductor Property in Inverter with Play Model
Shunya Odawara, Keisuke Fujisaki, Tetsuji Matsuo, Toyota Technological Institute, Japan; Kyoto University, Japan

P2106 - Evaluation of Dielectric Fluids for Macro-Scale Electrostatic Actuators and Machinery
Baoyun Ge, Daniel C. Ludois, University of Wisconsin-Madison, United States

P2107 - Parametric Design Optimization of a Novel Permanent Magnet Coupling using Finite Element Analysis
Stig Högberg, Nenad Mijatovic, Joachim Holböll, Bogi Bech Jensen, Flemming Buus Bendixen, Technical University of Denmark, Denmark; University of the Faroe Islands, Faroe Islands; Sintex a/s, Denmark

P2108 - Analysis of Insulation Diagnosis and Failure in Stator Windings of Air-Cooled Gas Turbine Generator
Hee-Dong Kim, Tae-Sik Kong, Korea Electric Power Corporation (KEPCO), Korea

P2109 - Green Mode Control Strategy of a PMSM with Front-end SEPIC PFC Converter
Chiao-Chien Lin, Ying-Yu Tzou, National Chiao Tung University, Taiwan

P2110 - Thermomagnetic Liquid Cooling: A Novel Electric Machine Thermal Management Solution
Gitit Karimi-Moghaddam, Darren D. Tremelling, Richard D. Gould, Subhashish Bhattacharya, North Carolina State University, United States; ABB Corporate Research, United States

Tuesday, September 16 – 10:00 am – 11:30 am

EAST

Poster Session: DFIG based Wind Systems
Room: Exhibit Hall C - East
Chair: Bilal Akin

P2301 - A No-Load Grid-Connected Strategy based on One-cycle Control for Doubly-Fed Wind Power System
Yanxia Shen, Zhicheng Ji, Tinglong Pan, Dinghui Wu, Jiangnan University, China

P2302 - Capability of DFIG WTS to Ride through Recurring Asymmetrical Grid Faults
Wenjie Chen, Frede Blaabjerg, Min Chen, Dehong Xu, Zhejiang University, China; Aalborg University, Denmark
P2303 - Model based methods for Rotor Position Detection of Doubly-Fed Induction Generator
Rongwu Zhu, Zhe Chen, Yunqian Zhang, Xiaojie Wu, Aalborg University, Denmark; University of Mining and Technology, China

P2304 - Sizing of the Series Dynamic Breaking Resistor in a Doubly Fed Induction Generator Wind Turbine
Hammam Soliman, Huai Wang, Dao Zhou, Frede Blaabjerg, Mostafa I. Marie, Aalborg University, Denmark; Ain Shams University, Egypt

P2305 - Shorted-Stator Mode Control of Doubly-Fed Induction Generator Connected to a Weak Grid
Adeola Balogun, Olorunfemi Ojo, Frank Okafor, University of Lagos, Nigeria; Tennessee Technological University, United States

Poster Session: Wave and Wind Generation Systems
Room: Exhibit Hall C - East
Chair: Seungdeog Choi

P2501 - Oscillating Water Column Power Conversion: A Technology Review
Nicola Delmonte, Davide Barater, Francesco Giuliani, Paolo Cova, Giampaolo Buticchi, University of Parma, Italy; University of Kiel, Germany

P2502 - Dynamic Emulation of Oscillating Wave Energy Converter
Samir Hazra, Ashish Sanjay Shrivastav, Akash Gujarati, Subhashish Bhattacharya, North Carolina State University, United States

P2503 - Wave Lab Testing of a Two-Body Autonomous Wave Energy Converter
Timothy M. Lewis, Bret Bosma, Annette von Jouanne, Ted K.A. Brekken, Oregon State University, United States

Poster Session: Converters for Solar PV Systems
Room: Exhibit Hall C - East
Chair: Ahmed Elasser

P2701 - Modeling and Digital Control of a High-Power Full-Bridge Isolated DC-DC Buck Converter Designed for a Two-Stage Grid-Tie PV Inverter
Paulo Sergio Nascimento Filho, Leonardo Ruffeil de Oliveira, Târcio André dos Santos Barros, Marcelo Gradella Villalva, Ernesto Ruppert Filho, University of Campinas, Brazil

P2702 - A High Set-Up Quasi-Z-Source Inverter based on Voltage-Lifting Unit
Linlin Li, Yu Tang, Nanjing University of Aeronautics and Astronautics, China

P2703 - A New DC-DC Buck-Boost Modified Series Forward Converter for Photovoltaic Applications
D. López del Moral, A. Barrado, M. Sanz, A. Lázaro, P. Zumel, Carlos III of Madrid University, Spain

P2704 - Development of a Four Phase Floating Interleaved Boost Converter for Photovoltaic Systems
Christopher D. Lute, Marcelo Simões, Danilo Iglesias Brandão, Ahmed Al Durra, S.M. Muyeen, Colorado School of Mines, United States; The Petroleum Institute, United Arab Emirates

Poster Session: Smart Grid Components
P2901 - Bridge-Type Fault Current Limiter for Asymmetric Fault Ride-Through Capacity Enhancement of Doubly Fed Induction Machine based Wind Generator  
Gilmanur Rashid, Mohd. Hasan Ali, University of Memphis, United States

P2902 - LCL Filter Design and Inductor Ripple Analysis for 3-Level NPC Grid Interface Converter  
Yang Jiao, Fred C. Lee, Virginia Polytechnic Institute and State University, United States

P2903 - A Unified Access Conditioner for Microgrid with Renewable Energy Sources  
Chang Yuan, Xiangning Xiao, North China Electric Power University, China

P2904 - Alternate Arm Converter Operation of the Modular Multilevel Converter  
M.M.C. Merlin, P.D. Judge, T.C. Green, P.D. Mitcheson, F. Moreno, K. Dyke, Imperial College London, United Kingdom; Alstom Grid, United Kingdom

P2905 - Impact of Frequency Modulation Ratio on Capacitor Cells Balancing in Phase-Shifted PWM based Chain-Link Statcom  
Ehsan Behrouzian, Massimo Bongiorno, Remus Teodeorescu, Chalmers University of Technology, Sweden; Chalmers University of Technology, Sweden; Aalborg University, Denmark

P2906 - A Full-Bridge AC Power Flow Controller with Reduced Capacitance Operated with both FFS (Fundamental Frequency Switching) and PWM  
Takanori Isobe, University of Tsukuba, Japan

P2907 - Startup Strategy of VSC-HVDC System based on Modular Multilevel Converter  
Fanqiang Gao, Zixin Li, Fei Xu, Zunfang Chu, Ping Wang, Yaohua Li, Chinese Academy of Sciences, China

P2908 - A Module based Self-Balanced Series Connection for IGBTs  
Lei Yang, Peng Fu, Xiu Yao, Jin Wang, Chinese Academy of Science, China; Ohio State University, United States

P2909 - Turn-off Voltage Sharing of Field Stop IGBTs in Series Connection  
Xueqiang Zhang, Xin Yang, Jin Zhang, Weiwel He, Patrick R. Palmer, University of Cambridge, United Kingdom

P2910 - Over-Current Protection Scheme for SiC Power MOSFET DC Circuit Breaker  
Yuan Zhang, Yung C. Liang, National University of Singapore, Singapore

P2911 - A High Density Converter for Mid Feeder Voltage Regulation of Low Voltage Distribution Networks  
Richard Silversides, Tim Green, Michael M.C. Merlin, Imperial College London, United Kingdom

P2912 - Analysis on Practical Design of Virtual-Air-Gap Variable Reactors for Tieline Reclosing in Microgrid  
Yucheng Zhang, Praveen Devakota, Ruiyun Fu, South Dakota School of Mines and Technology, United States

P2913 - Wind Powered Smart Charging Facility for PHEVs  
Preetham Goli, Wajiha Shireen, University of Houston, United States

P2914 - Supercapacitor Assisted Surge Absorber (SCASA) Technique: Selection of Supercapacitor and Magnetic Components  
Jayathu Fernando, Nihal Kularatna, University of Waikato, New Zealand
P2915 - One and Two DC-Links Universal Active Power Filter without Series Isolation Transformer

Poster Session: Power Supplies
Room: Exhibit Hall C - East
Chair: Jean Luc Schanen, Shuo Wang

P3101 - Analyses of the Impact of Current Load Change on a Current-Mode Constant On-Time Buck Converter Regulator
Ming-Chuan Yen, Dan Chen, Sheng-Fu Hsiao, Yung-Jen Chen, National Taiwan University, Taiwan; Richtek Technology Corporation, Taiwan

P3102 - High Efficiency Point-of-Load and Bus Converter System using Built-in Converters
Won-Yong Sung, Chang-Yeol Oh, Jung-Hoon Ahn, Byoung-Kuk Lee, Yun-Sung Kim, Sungkyunkwan University, Korea

NORTH

Poster Session: Isolated DC-DC Converters
Room: Exhibit Hall C - North
Chair: Wei Qiao

P3301 - A Line and Load Independent Constant-Frequency Zero-Voltage-Switching Series Resonant Converter
Alireza Safaee, Konrad Woronowicz, Praveen Jain, Alireza Bakhshai, Bombardier Transportation Inc., Canada; Queen's University, Canada

P3302 - An Improved Start-Up Method for LLC Series Resonant Converter based on State-Plane Analysis
Dongdong Yang, Changsong Chen, Shanxu Duan, Jiuqing Cai, Huazhong University of Science and Technology, China

P3303 - Analysis of a Novel Interleaved CLL Resonant Converter for EV Battery Charger Applications
Erdem Asa, Kerim Colak, Dariusz Czarkowski, New York University, United States

P3304 - High Power LLC Battery Charger: Wide Regulation using Phase-Shift for Recovery Mode
Navid Shafiei, Martin Ordonez, Marian Cracium, Murray Edington, Chris Botting, University of British Columbia, Canada; Delta-Q Technologies, Canada

P3305 - Modular Snubberless Bidirectional Soft-Switching Current-Fed Dual 6-Pack (CFD6P) DC/DC Converter
Satarupa Bal, Akshay K. Rathore, Dipti Srinivasan, National University of Singapore, Singapore

P3306 - A Novel Interleaved LLC Resonant Converter with Phase Shift Modulation
Koji Murata, Fujio Kurokawa, Nagasaki University, Japan

P3307 - High Voltage Dual Active Bridge with Series Connected High Voltage Silicon Carbide (SiC) Devices
Kasunaidu Vechalapu, Arun Kumar Kadavelugu, Subhashish Bhattacharya, North Carolina State University, United States

P3308 - Piecewise Linear Modeling of Snubberless Dual Active Bridge Commutation
Babak Farhangi, Hamid A. Toliyat, Texas A&M University, United States
P3309 - Analysis and Comparison of Voltage-Source and Current-Source Asymmetric Dual-Active Half-Bridge Converters
Shiladri Chakraborty, Souvik Chattopadhyay, Indian Institute of Technology, India

Poster Session: Multi-Level Converters
Room: Exhibit Hall C - North
Chair: Pericle Zanchetta

P3501 - Capacitor Selection for Modular Multilevel Converter
Yuan Tang, Li Ran, Olayiwola Alatise, Philip Mawby, University of Warwick, United Kingdom

P3502 - An FPGA-based Real-Time Simulator for HIL Testing of Modular Multilevel Converter Controller
Wei Li, Luc-André Grégoire, Sisounthone Souvanlasy, Jean Bélanger, OPAL-RT Technologies, Canada

P3503 - A Carrier-based PWM Method for Neutral-Point Ripple Reduction of a 3-Level Inverter
June-Seok Lee, Kyo-Beum Lee, Ajou University, Korea

P3504 - A Detection Method for an Open-Switch Fault in Cascaded H-Bridge Multilevel Inverters
Hyun-Woo Sim, June-Seok Lee, Kyo-Beum Lee, Ajou University, Korea

P3505 - AC-DC-AC Three-Phase Converter based on Three Three-Leg Converters Connected in Series
Nustenil S.M.L. Marinus, Cursino B. Jacobina, Nady Rocha, Euzeli C. dos Santos Jr., Federal University of Campina Grande, Brazil; Federal University of Paraiba, Brazil; Federal Institute of the Ceará, Brazil; Indiana University-Purdue University Indianapolis, United States

P3506 - An Adaptive Backstepping Observer for Modular Multilevel Converter
Vahid Najmi, Hamed Nademi, Rolando Burgos, Virginia Polytechnic Institute and State University, United States; ABB Ltd., Norway

P3507 - Condition Monitoring for Submodule Capacitors in Modular Multilevel Converters
Yun-Jae Jo, Thanh Hai Nguyen, Dong-Choon Lee, Yeungnam University, Korea

P3508 - A New Five-Level Hybrid-Clamped Converter with Reduced Number of Clamping Devices
Kui Wang, Lie Xu, Zedong Zheng, Yongdong Li, Tsinghua University, China

P3509 - A Simple Capacitor Voltage Balancing Method for Nested Neutral Point Clamped Inverter
Kai Tian, Bin Wu, Mehdi Narimani, Dewei Xu, Zhongyang Cheng, Navid Reza Zargari, Ryerson University, Canada; Rockwell Automation Canada, Canada

P3510 - A High Cell Count Cascade Full Bridge Converter for Wide Bandwidth Ultrasonic Transducer Excitation
Geoffrey R. Walker, Negareh Ghasemi, Mark A.H. Broadmeadow, Gerard F. Ledwich, Queensland University of Technology, Australia

P3511 - Improved Thermal Management of Multi-Level Converter Building Module to Realize Higher Power Density
Hidemine Obara, Yukihiko Sato, Chiba University, Japan

P3512 - THD Minimization of Modular Multilevel Converter with Unequal DC Values
Ghazal Falahi, Wensong Yu, Alex Q. Huang, North Carolina State University, United States
Poster Session: Passives and Converters
Room: Exhibit Hall C - North
Chair: Jean Luc Schanen, Shuo Wang

P3701 - Design and Analysis of 37.5% Energy-Recycling Flyback-Type Class-D Gate Driver IC with 5-to-15V Level-Conversion
Taewook Kang, Jaeha Kim, Seoul National University, Korea

P3702 - Optimization and Analysis of PwrSoc Buck Converter with Integrated Passives for Automotive Application
V. Šviković, J. Cortes, P. Alou, J. Oliver, J.A. Cobos, Universidad Politécnica de Madrid, Spain

P3703 - A 9-11 Bits Phase-Interpolating Digital Pulse-Width Modulator with 1000X Frequency Range
Yoontaek Lee, Taewook Kang, Jaeha Kim, Seoul National University, Korea

P3704 - A Transient Core Loss Analysis of Multiple-Gap Inductor Designed for the 2010 Prius
Masaki Wasekura, Chi-Ming Wang, Robert D. Lorenz, Toyota Motor Corporation, Japan; Toyota Research Institute of North America, United States; University of Wisconsin-Madison, United States

P3705 - Low AC Resistance Foil Cut Inductor
Weyman Lundquist, Vivien Yang, Carl Castro, West Coast Magnetics, United States

P3706 - Loss Minimization for Coupled Inductors with Significant Ac Flux
Zhemin Zhang, Milisav Danilovic, Khai D.T. Ngo, Jeff L. Nilles, Virginia Polytechnic Institute and State University, United States; Texas Instruments Inc., United States

P3707 - The Use of Dielectric Coatings in Capacitive Power Transfer Systems
Baoyun Ge, Daniel C. Ludois, Rodolfo Perez, University of Wisconsin-Madison, United States

P3708 - Litz Wire Pulsed Power Air Core Coupled Inductor
Victor Sung, W.G. Odendaal, Virginia Polytechnic Institute and State University, United States

P3709 - A 0.76W/mm2 On-Chip Fully-Integrated Buck Converter with Negatively-Coupled, Stacked-LC Filter in 65nm CMOS
Minbok Lee, Yunju Choi, Jaeha Kim, Seoul National University, Korea

P3710 - Understanding dv/dt of 15 kV SiC N-IGBT and its Control using Active Gate Driver
Arun Kadavelugu, Subhashish Bhattacharya, Sei-Hyung Ryu, David Grider, Scott Leslie, Kamalesh Hatua, North Carolina State University, United States; Cree, Inc, United States; Powerex, Inc., United States; Indian Institute of Technology Madras, India

Poster Session: Grid-Connected Power Converters and Control
Room: Exhibit Hall C - South
Chair: Jean Luc Schanen, Shuo Wang

P3901 - Grid-Tie Switched Inductor with Voltage Multiplier Inverter
Omar Abdel-Rahim, Funato Hirohito, Junnosuke Haruna, Aswan University, Egypt; Utsunomiya University, Japan

P3902 - Voltage Droop Control of Dual Active Bridge for Integrating Battery Energy Storage to Utility Grid
Srinivas Bhaskar Karanki, David Xu, Ryerson University, Canada

P3903 - Performance Evaluation of a 3-Level ANPC Photovoltaic Grid-Connected Inverter with 650V SiC Devices and Optimized PWM
Davide Barater, Carlo Concari, Giampaolo Buticchi, Emre Gurpinar, Dipankar De, Alberto Castellazzi, University of Parma, Italy; University of Kiel, Germany; University of Nottingham, United Kingdom

P3904 - Active Damping Control of LLCL Filters based on Virtual Resistor for T-Type Three-Level PWM Converters
Payam Alemi, Dong-Choon Lee, Yeungnam University, Korea

P3905 - Coordinative Control of Active Power and DC-Link Voltage for Cascaded Dual-Active-Bridge and Inverter in Bidirectional Application
Yanjun Tian, Zhe Chen, Fujin Deng, Xiaofeng Sun, Yanting Hu, Aalborg University, Denmark; Yanshan University, China; Glyndwr University, United Kingdom

P3906 - The Impact of Gate-Drive Parameters Variation and Device Degradation in the PV-Inverter Lifetime
C. Sintamarean, H. Wang, F. Blaabjerg, F. Iannuzzo, Aalborg University, Denmark; University of Cassino and Southern Lazio, Italy

P3907 - Control of a 19 Level Cascaded H-Bridge Multilevel Converter Photovoltaic System
N.D. Marks, T.J. Summers, R.E. Betz, University of Newcastle, Australia

P3908 - A New DPWM Modulation for Three-Level Neutral Point Clamped Inverter with Assuming Balanced Neutral-Point Voltage
Tzung-Lin Lee, Tsung-Yu Hsieh, National Sun Yat-Sen University, Taiwan

Poster Session: Off-Grid Power Converters and Control
Room: Exhibit Hall C - South
Chair: Luca Zarri

P4101 - Decentralized Architecture and Control of Photovoltaic Generation System based on Cascaded AC Module Integrated Converter
Huan Hu, Xu She, Alex Huang, Texas Instrument, United States; GE Global Research, United States; North Carolina State University, United States

P4102 - A New Modulation Technique for Wide-Range Control of Output Voltage in Z-Source Inverters
M.S. Diab, A. Elserougi, A.S. Abdel-Khalik, A.M. Massoud, Shehab Ahmed, Alexandria University, Egypt; Qatar University, Qatar; Texas A&M University at Qatar, Qatar

P4103 - A Novel ZVS and ZCS Three-Port LLC Resonant Converter for Renewable Energy Systems
Jiang Tianyang, Qizheng Lin, Junming Zhang, Yousheng Wang, Zhejiang University, China; Pinghu Electronics Co., Ltd., China

P4104 - High Step-Up Tapped Inductor SEPIC Converter with Charge Pump Cell
Jia Yao, Alexander Abramovitz, Keyue Smedley, Southeast University, China; University of California, Irvine, United States
P4105 - Piezoelectric Energy Harvesting Circuit using Full-Wave Voltage Doubler Rectifier and Switched Inductor
Yukito Kushino, Hirotaka Koizumi, Tokyo University of Science, Japan

P4106 - Model Predictive Control of DC/DC Converter for Ultracapacitors Energy Storage Union based on T-S Model
Jianfeng Liu, Qing Yan, Zhiwu Huang, Cheng Luo, Central South University, China

P4107 - A Droop Controller Achieving Proportional Power Sharing without Output Voltage Amplitude or Frequency Deviation
Yu Zeng, Qing-Chang Zhong, University of Sheffield, United Kingdom

P4108 - A Novel Distributed PV System with Ultra-High-Frequency-AC Bus for Residential Applications
Mengqi Wang, Qingyun Huang, Alex Q. Huang, Wensong Yu, Ruiyang Yu, North Carolina State University, United States

P4109 - Harmonics Analysis for a High-Frequency-Link (HFL) Inverter
Alireza Tajfar, Hossein Riazmontazer, Sudip K. Mazumder, Enphase Energy, United States; University of Illinois, United States

WEST

Poster Session: PM Machines
Room: Exhibit Hall C - West
Chair: Abraham Gebregergis, Akira Chiba

P4301 - Design of Consequent-Pole, Toroidal-Winding, Outer Rotor Vernier Permanent Magnet Machines
Dawei Li, Ronghai Qu, Jian Li, Wei Xu, Huazhong University of Science and Technology, China

P4302 - Design Process of Dual-Stator, Spoke-Array Vernier Permanent Magnet Machines
Dawei Li, Ronghai Qu, Wei Xu, Jian Li, T.A. Lipo, Huazhong University of Science and Technology, China; University of Wisconsin-Madison, United States

P4303 - Analysis of a PM Vernier Motor with Spoke Structure
Byungtaek Kim, Thomas A. Lipo, Kunsan National University, Korea; University of Wisconsin-Madison, United States

P4304 - A New Type of Harmonic Current Excited Brushless Synchronous Machine based on an Open Winding Pattern
Lizhi Sun, Xiaolong Gao, Fei Yao, Quntao An, Thomas Lipo, Harbin Institute of Technology, China; University of Wisconsin-Madison, United States

P4305 - Rotor Shape Optimization for Output Maximization of Permanent Magnet Assisted Synchronous Machines
Katsumi Yamazaki, Kazuya Utsuno, Kazuo Shima, Tadashi Fukami, Masato Sato, Chiba Institute of Technology, Japan; Kanazawa Institute of Technology, Japan

P4306 - Cancellation of Torque Ripple Accompanying Space Harmonics in SPMSM
Shingo Ehara, Shoji Shimomura, Shibaura Institute of Technology, Japan
P4307 - Study of Suitable Motor Structure for IPMSM with High Flux Density Material
Masashi Matsuhara, Masayuki Sanada, Shigeo Morimoto, Yukinori Inoue, Osaka Prefecture University, Japan

P4308 - Comparison of Optimized Permanent Magnet Assisted Synchronous Reluctance Motors with Three-Phase and Five-Phase Systems
Sai Sudheer Reddy Bonthu, Jeihoon Baek, Seungdeog Choi, University of Akron, United States; Korea Railroad Research Institute, Korea

P4309 - A Comparison between Maximum Torque/Ampere and Maximum Efficiency Control Strategies in IPM Synchronous Machines
James Goss, Mircea Popescu, Dave Staton, Rafal Wrobel, Jason Yon, Phil Mellor, Motor Design Ltd, United Kingdom; University of Bristol, United Kingdom

P4310 - Design of Several Un-Skewed Radial Flux Permanent Magnet Synchronous Motors with Asymmetric and Symmetric AC Windings – A Comparative Study
Y. Demir, M. Aydin, MDS Motor Design Ltd., Turkey; Kocaeli University, Turkey

P4311 - Optimal Design of Five-Phase Permanent Magnet Assisted Synchronous Reluctance Motor for Low Output Torque Ripple
Jeihoon Baek, Sai Sudheer Reddy Bonthu, Sangshin Kwak, Seungdeog Choi, Korea Railroad Research Institute, Korea; University of Akron, United States; Chung-Ang University, Korea

P4312 - Interior PM Generator for Portable AC Generator Sets
Wen L. Soong, Solmaz Kahourzade, Chong-Zhi Liaw, Paul Lillington, University of Adelaide, Australia; Radial Flux Laboratories Pty. Ltd., Australia

P4313 - Prediction of Magnetically Induced Vibration in a PMSM using Time Stretched Pulse Excitation
Doyeon Kim, Jeongyong Song, Gunhee Jang, Hanyang University, Korea

P4314 - Optimal Rotor Shape Design to Reduce the Vibration of IPMSM
Min-Chul Kang, Dong-Yeong Kim, Gyu-Tak Kim, Changwon National University, Korea

P4315 - Cogging Torque Reduction of Single-Phase Brushless DC Motor with a Tapered Air-Gap using Optimizing Notch Size and Position
Dae-kyong Kim, Young-un Park, Ju-Hee Cho, Sunchon National University, Korea; Korea Electronics Technology Institute, Korea

P4316 - Verification of a Novel 5-Axis Active Control Type Bearingless Canned Motor Pump Utilizing Passive Magnetic Bearing Function for High Power
Kazuya Miyamoto, Masatsugu Takemoto, Satoshi Ogasawara, Masao Hiragushi, Hokkaido University, Japan; SEIKOW Chemical Engineering and Machinery, Ltd., Japan

Poster Session: Control Issues in Electric Drives I
Room: Exhibit Hall C - West
Chair: Mahesh Swamy

P4501 - Sensorless Control Method using Differentiation Circuit for Switched Reluctance Motor
Satoshi Sumita, Kenta Deguchi, Yoshiataka Iwaji, Yuji Enomoto, Hitachi, Ltd., Japan

P4502 - Sensorless Control of PMSM in a Ultra High Speed Region taking Iron Loss into Account
P4503 - Implementation and Evaluation of Online System Identification of Electromechanical Systems using Adaptive Filters
Parag Kshirsagar, Dong Jiang, Zhendong Zhang, United Technologies Research Center, United States

P4504 - Control Strategy of a Permanent Magnet Synchronous Machine in the Flywheel Energy Storage System
Wei Gua, Yue Wang, Xi’an Jiaotong University, China

P4505 - Enhancement of Output Voltage using Current Shaping in Sensorless AC Machine Drive
Jin-Woong Kim, Jung-Ik Ha, Seoul National University, Korea

P4506 - Zero/Low Speed Magnet Magnetization State Estimation using High Frequency Injection for a Fractional Slot Variable Flux-Intensifying Interior Permanent Magnet Synchronous Machine
Chen-Yen Yu, Takashi Fukushige, Apoorva Athavale, Brent Gagas, Kan Akatsu, David Reigosa, Robert D. Lorenz, University of Wisconsin-Madison, United States; Nissan Motor Co., Ltd., Japan; Shibaura Institute of Technology, Japan; University of Oviedo, Spain

P4507 - Operation of Doubly Fed Induction Generator in Ocean Wave Energy Conversion System by Stator Phase Sequence Switching
Samir Hazra, Subhashish Bhattacharya, North Carolina State University, United States

P4508 - Nonlinear Analysis for Interleaved Boost Converters based on Monodromy Matrix
Haimeng Wu, Volker Pickert, Damian Giaouris, Newcastle University, United Kingdom; Centre for Research and Technology Hellas, Greece

Tuesday, September 16 – 3:30 pm – 5:00 pm

EAST

Poster Session: Solar PV Systems
Room: Exhibit Hall C - East
Chair: Dezso Sera

P4701 - Comparison of the Perturb and Observe and Simulated Annealing Approaches for Maximum Power Point Tracking in a Photovoltaic System under Partial Shading Conditions
S. Lyden, M.E. Haque, University of Tasmania, Australia

P4702 - Statistical Analysis of Ramp Rates of Solar Photovoltaic System Connected to Grid
Md Kamal Hossain, Mohd Hasan Ali, University of Memphis, United States

P4703 - Single-Phase ZVS Bidirectional AC-Link Converter for EV Batteries-Grid Integration
Gamal M. Dousoky, Mostafa Mosa, Haitham Abu-Rub, Minia University, Egypt; Aswan University, Egypt; Texas A&M University at Qatar, Qatar

P4704 - A High Performance Controller for a Single Phase Cascaded Multilevel Photovoltaic System
Huan Hu, Xu She, Alex Q. Huang, Texas Instrument Inc., United States; GE Global Research, United States; North Carolina State University, United States
**Poster Session: Energy Storage Systems**

*Room: Exhibit Hall C - East*

*Chair: Adel Nasiri*

**P4901 - Balanced Supercapacitor Energy Storage Module based on Multifunctional ISOS Converter**
Wei Jiang, Xiaogang Wu, Renjie Hu, Wu Chen, Southeast University, China

**P4902 - Research of Multipurpose Optimization Control in Hybrid Energy Storage System**
Wei Jiang, Renjie Hu, Wu Chen, Xiaodong Wang, Zhong Li, Yongbiao Yang, Jinming Wang, Southeast University, China; Changzhi Electric Power Supply Company, China; NARI Technology Co., Ltd., China

**P4903 - A New Concept of Gas Turbine System: Motor-Assisted Gas Turbine with High-Speed Motor**
Noriaki Hino, Aung Kothet, Naohiro Kusumi, Hitachi, Ltd., Japan

**P4904 - A Unified Control Scheme of Battery Energy Storage System based on Cascaded H-Bridge Converter**
Qiang Chen, Ning Gao, Rui Li, Xu Cai, Zhigang Lu, Shanghai Jiaotong University, China; Electric Power Research Institute, China

**P4905 - State-of-Charge Balancing Control Strategy of Battery Energy Storage System based on Modular Multilevel Converter**
Feng Gao, Lei Zhang, Qi Zhou, Mengxing Chen, Tao Xu, Shaogang Hu, Shandong University, China; State Grid Anshan Electric Power Supply Company, China

**P4906 - The Impact of DC bias Current on the Modeling of Lithium Iron Phosphate and Lead-Acid Batteries Observed using Electrochemical Impedance Spectroscopy**
Larry W. Juang, Philip J. Kollmeyer, Ruxiu Zhao, T.M. Johns, R.D. Lorenz, University of Wisconsin-Madison, United States

**P4907 - Investigation of a Data-Driven SOC Estimator based on the Merged SMO and Degradation Mitigation for Series/Parallel-Cell Configured Battery Pack**
Jonghoon Kim, Chosun University, Korea

---

**Poster Session: Power Converters for Alternative Energy Systems**

*Room: Exhibit Hall C - East*

*Chair: Paolo Mattavelli, Ion Exteberria*

**P5101 - Modeling of Single-HB PWM Modulated Dual Active Bridge DC-DC Converter with Multifrequency Average Approach**
Yuan Gao, Yue Wang, Jun Huang, Ming Li, Xu Yang, Xi’an Jiaotong University, China

**P5102 - Modularized High Frequency High Power 3-Level Neutral Point Clamped PEBB Cell for Renewable Energy System**
Sizhao Lu, Zhengming Zhao, Liqiang Yuan, Ting Lu, Yang Jiao, Mingkai Mu, Fred C. Lee, Tsinghua University, China; Virginia Polytechnic Institute and State University, United States

**P5103 - A Novel TRIAC Dimming LED Driver by Variable Switched Capacitance for Power Regulation**
Eun S. Lee, Jun P. Cheon, Duy N. Tan, Chun T. Rim, KAIST, Korea

**P5104 - Analysis and Design Considerations of Two-Stage AC-DC LED Driver without Electrolytic Capacitor**
Siyang Zhao, Xianmian Ge, Xinke Wu, Junming Zhang, Huajian Zhang, Zhejiang University, China; Inventronics (Hangzhou), Inc., China

**Poster Session: Stability and Quality of Microgrids**  
**Room: Exhibit Hall C - East**  
**Chair: Norma Anglani, Feng Guo**

**P5301 - Fault-Decoupled Instantaneous Frequency and Phase Angle Estimation for Three-Phase Grid-Connected Inverters**  
G. De Donato, G. Scelba, F. Giulii Capponi, G. Scarcella, University of Rome "La Sapienza", Italy; University of Catania, Italy

**P5302 - Fault Current and Overvoltage Calculations for Inverter-based Generation using Symmetrical Components**  
Laura Wieserman, T.E. McDermott, University of Pittsburgh, United States

**P5303 - Power Quality Improvement of Single-Phase Photovoltaic Systems through a Robust Synchronization Method**  
Lenos Hadjidemetriou, Elias Kyriakides, Yongheng Yang, Frede Blaabjerg, University of Cyprus, Cyprus; Aalborg University, Denmark

**P5304 - Prediction and Avoidance of Grid-Connected Converter's Instability caused by Wind Park Typical, Load-Varying Grid Resonance**  
F. Fuchs, A. Mertens, Leibniz Universität Hannover, Germany

**P5305 - Grid Synchronization using Fixed Filtering with Magnitude and Phase Compensation**  
Bradford Trento, Leon M. Tolbert, Daniel Costinett, University of Tennessee, United States

**P5306 - Finite-Time Frequency Synchronization in Microgrids**  
Ali Bidram, Ali Davoudi, Frank L. Lewis, University of Texas-Arlington, United States

**P5307 - Quadrature Signal Generator based on All-Pass Filter for Single-Phase Synchronization**  
Cristian Blanco, David Reigosa, Fernando Briz, Juan M. Guerrero, University of Oviedo, Spain

**P5308 - A DC Fault Clearance Method for Series Multiterminal HVDC System**  
Xiaobo Yang, Dawei Yao, Chunming Yuan, Chengyan Yue, Chao Yang, River Tin-Ho Li, ABB (China) Limited, China

**P5309 - Virtual Impedance based Stability Improvement for DC Microgrids with Constant Power Loads**  
Xiaonan Lu, Kai Sun, Lipei Huang, Josep M. Guerrero, Juan C. Vasquez, Yan Xing, University of Tennessee, United States; Tsinghua University, China; Aalborg University, Denmark; Nanjing University of Aeronautics and Astronautics, China

**P5310 - Analysis and Assessment of Microgrid Stability using the Nu Gap Approach**  
Abdulgafor Alfares, Ahmed Sayed-Ahmed, Marquette University, United States; Rockwell Automation, United States

**P5311 - Comparison of Synchronous Condenser and STATCOM for Inertial Response Support**  
Yang Liu, Shuitao Yang, Shao Zhang, Fang Zheng Peng, Michigan State University, United States
Poster Session: Single-Phase AC-DC Converters
Room: Exhibit Hall C - North
Chair: Yogesh Patel

P5501 - Direct AC/DC Rectifier with Mitigated Low-Frequency Ripple through Waveform Control
Sinan Li, Guorong Zhu, Siew-Chong Tan, S.Y.R. Hui, University of Hong Kong, Hong Kong; Wuhan University of Technology, China

P5502 - Design of Class E Resonant Rectifiers and Diode Evaluation for VHF Power Conversion
Juan A. Santiago-González, Khalil M. Elbaggari, Khurram K. Afridi, David J. Perreault, Massachusetts Institute of Technology, United States; University of Colorado-Boulder, United States

P5503 - Novel Zero-Voltage Transition Semi Bridgeless Boost PFC Converter with Soft Switching Auxiliary Switch
Wei Hu, Yong Kang, Xuehua Wang, Xiaoning Zhou, Huazhong University of Science and Technology, China; Wuhan Quanhua Optoelectronics Co. Ltd, China

P5504 - An Electrolytic-Free Offline LED Driver with a Ceramic-Capacitor-based Compact SSC Energy Buffer
Minjie Chen, Yu Ni, Curtis Serrano, Benjamin Montgomery, David Perreault, Khurram Afridi, Massachusetts Institute of Technology, United States; University of Colorado-Boulder, United States

P5505 - A Comparison Study of Boost and Buck-Boost Power Factor Corrector for Ultra-Wide Input Voltage Range Applications
Sheng-Yang Yu, Hung-Chi Chen, Texas Instruments Inc., United States; National Chiao Tung University, Taiwan

P5506 - Analysis on Ringing Effect of Auxiliary Winding in Primary Side Regulated Flyback Converter
Taizhi Zhang, Qinsong Qian, Manchao Xu, Weifeng Sun, Shengli Lu, Southeast University, China

P5507 - A Single-Phase Rectifier with a Neutral Leg to Reduce DC-Bus Voltage Ripples
Wen-Long Ming, Qing-Chang Zhong, Wanxing Sheng, University of Sheffield, United Kingdom; China Electric Power Research Institute, China

P5508 - Modelling and Simulation of Bridgeless PFC modified SEPIC Rectifier with Multiplier Cell
Ahmed M. Al Gabri, Abbas A. Fardoun, Esam H. Ismail, United Arab Emirates University, United Arab Emirates; College of Technological Studies, Kuwait

Poster Session: Single-Phase DC-AC Converters
Room: Exhibit Hall C - North
Chair: Marcello Pucci

P5701 - A High Frequency Transformer Isolated Inverter Excepting No Duty Cycle Loss
Zibo Lv, Yan Deng, Hao Peng, Ying Wang, Xiangning He, Zhejiang University, China

P5702 - Active Buck-Boost Inverter with Coupled Inductors
Yu Tang, Yaohua He, Xianmei Dong, Nanjing University of Aeronautics and Astronautics, China

P5703 - A Systematic Method to Synthesize New Transformerless Full-Bridge Grid-Tied Inverter
Hongliang Wang, Sarah Burton, Yan-fei Liu, P.C. Sen, Josep M. Guerrero, Queen's University, Canada; Aalborg University, Denmark
P5704 - Phase-Shift Soft-Switching Power Amplifier with Lower EMI Noise
Ruxi Wang, Juan Sabate, Ying Mei, Jianguo Xiao, Song Chi, General Electric Global Research, United States

P5705 - SiC Full-Bridge Grid-Tied Inverter with ZVS-Switching
Guangcheng Hu, Yawen Li, Yenan Chen, Min Chen, Dehong Xu, Yasuhiko Arita, Seiki Igarashi, Tatsuhiko Fujihira, Zhejiang University, China; Fuji Electric Co., Ltd, Japan

P5706 - A Unified Switched Capacitor Converter
Bin Wu, Smedley Keyue, Singer Sigmond, University of California-Irvine, United States; Tel-Aviv University, Israel

P5707 - Improved Trans-Current-Fed Switched Inverter
Soumya Shubhra Nag, Santanu Mishra, Indian Institute of Technology Kanpur, India

P5708 - Compression of the Load Resistance Range in Constant Frequency Resonant Inverters
Milisav Danilovic, Khai D.T. Ngo, Zhemin Zhang, Virginia Polytechnic Institute and State University, United States

P5709 - Double Four-Quadrants Single-Phase Current Source Converter Sharing the Same DC-Bus
Montiê A. Vitorino, Mauricio B.R. Corrêa, Louelson C. Costa, Lucas V. Hartmann, Darlan A. Fernandes, Federal University of Campina Grande, Brazil; Federal University of Paraiba, Brazil

P5710 - A Hybrid Inverter System for Medium Voltage Applications using a Low Voltage Auxiliary CSI
Savvas Papadopoulos, Mohamed Rashed, Christian Klumpner, Pat Wheeler, University of Nottingham, United Kingdom

Poster Session: Devices and Modules
Room: Exhibit Hall C - North
Chair: Tanya Gachovska, Angus Bryant

P5901 - Electrothermal Modeling and Characterization of SiC Schottky and Silicon PiN Diodes Switching Transients
Saeed Jahdi, Olayiwola Alatise, Petros Alexakis, Li Ran, Phil Mawby, University of Warwick, United Kingdom

P5902 - Static and Dynamic Characterization of High Power Silicon Carbide BJT Modules
Muhammad Nawaz, Nan Chen, Filippo Chimento, Liwei Wang, ABB Corporate Research, Sweden

P5903 - Analysis on Reverse Recovery Characteristics of SiC MOSFET Intrinsic Diode
Zhaohui Wang, Jiajia Ouyang, Junming Zhang, Xinke Wu, Kuang Sheng, Zhejiang University, China

P5904 - Analysis of Stray Inductance's Influence on SiC MOSFET Switching Performance
Zhaohui Wang, Junming Zhang, Xinke Wu, Kuang Sheng, Zhejiang University, China

P5905 - Design of Overcurrent Protection Circuit for GaN HEMT
Bo Huang, Yan Li, Trillion Q. Zheng, Yajing Zhang, Beijing Jiaotong University, China

P5906 - Insulated Gate Driver for eGaN FET
Johan Delaine, Pierre-Olivier Jeannin, David Frey, Kevin Guepratte, University Grenoble Alpes, France; Thales Systemes Aeroportes, France
P5907 - Physical Modeling and Optimization of a GaN HEMT Design with a Field Plate Structure for High Frequency Applications
D. Cucak, M. Vasic, O. Garcia, Y. Bouvier, J. Oliver, P. Alou, J.A. Cobos, A. Wang, S. Martin-Horcajo, F. Romero, F. Calle, Universidad Politecnica de Madrid, Spain

P5908 - Investigation of Soft-Switching Behavior of 600 V Cascode GaN HEMT
Weimin Zhang, Fred Wang, Leon M. Tolbert, Benjamin J. Blalock, Daniel Costinett, University of Tennessee-Knoxville, United States

P5909 - A Temperature Dependent Simple Spice based Modeling Platform for Power IGBT Modules
Georgios Sfakianakis, Muhammad Nawaz, Filippo Chimento, Eindhoven University of Technology, Netherlands; ABB Corporate Research, Sweden

P5910 - An Ultra-Fast SiC Phase-Leg Module in Modified Hybrid Packaging Structure
Zheng Chen, Yiyin Yao, Dushan Boroyevich, Khai Ngo, Wenli Zhang, Virginia Polytechnic Institute and State University, United States

P5911 - Effect of Pulse Width on Dynamic Characteristics of High Voltage IGBTs
John F. Donlon, Eric R. Motto, Eugen Wiesner, Eugen Stumpf, Shinichi Iura, Hitoshi Uemura, Powerex, Inc., United States; Mitsubishi Electric Europe B.V., Germany; Mitsubishi Electric Corp., Japan

P5912 - Next Generation Industrial IGBT Module
Eric R. Motto, John F. Donlon, Masaomi Miyazawa, Mitsuharu Tabata, Hiroki Muraoka, Tomohiro Hieda, Thomas Radke, Powerex Inc., United States; Mitsubishi Electric Corporation, Japan; Mitsubishi Electric Europe B.V., Germany

P5913 - The Next Generation 6.5kV IGBT
John F. Donlon, Eric R. Motto, Eugen Wiesner, Eckhard Thal, Kenji Hatori, Yasuhiro Sakai, Shuichi Kitamura, Tetsuo Motomiya, Kenji Ota, Yumie Kitajima, Shinichi Iura, Hiroshi Yamaguchi, Kazuhiro Kurachi, Powerex, Inc., United States; Mitsubishi Electric Europe B.V., Germany; Mitsubishi Electric Corp., Japan

P5914 - A Temperature-Dependent Thermal Model of IGBT Modules Suitable for Circuit-Level Simulations
Rui Wu, Huai Wang, Ke Ma, Pramod Ghimire, Francesco Iannuzzo, Frede Blaabjerg, Aalborg University, Denmark

P5915 - Sensing Power MOSFET Junction Temperature using Gate Drive Turn-On Current Transient Properties
He Niu, Robert D. Lorenz, University of Wisconsin Madison, United States

SOUTH
Poster Session: Control and Applications in Renewable Energy, EMI and EVs
Room: Exhibit Hall C - South
Chair: Tanya Gachovska, Angus Bryant

P6101 - An Electronically Isolated 12 Pulse Autotransformer Rectification Scheme to Improve Input Power Factor and Lower Harmonic Distortion in Variable Frequency Drives
Mahesh M. Swamy, Yaskawa America Inc., United States

P6102 - Three Level NPC Inverter dc Capacitor Sizing for a Synchronous Reluctance Machine Drive
Lesedi Masisi, Pragasen Pillay, Sheldon S. Williamson, Concordia University, Canada
P6103 - DG Control Strategies for Grid Voltage Unbalance Compensation
Jinghang Lu, Farzam Nejabatkhah, Yunwei Li, Bin Wu, University of Alberta, Canada; Ryerson University, Canada

P6104 - Design of LCL Filter for Improving Robustness of Grid-Connected Voltage Source Inverter
DongSul Shin, Hee-Je Kim, Jong-Pil Lee, Tae-Jin Kim, Dong-Wook Yoo, Pusan National University, Korea; Korea Electrotechnology Research Institute, Korea

P6105 - Neutral Current Mitigation using Controlled Electric Springs Connected to Microgrids within Built Environment
Krishnanand K.R., Syed Muhammad Farzan Hasani, Jayantika Soni, Sanjib Kumar Panda, National University of Singapore, Singapore

P6106 - Resonant-Repetitive Combined Control for Stand-Alone Power Supply Units
Alessandro Lidozzi, Chao Ji, Luca Solero, Pericle Zanchetta, Fabio Crescimbini, Roma Tre University, Italy; University of Nottingham, United Kingdom

P6107 - Convertible Static Transmission Controller (CSTC) System Model Validation by Controller Hardware-in-the-Loop-Simulation
Nima Yousefpoor, Babak Parkhideh, Ali Azidehak, Subhashish Bhattacharya, Quanta Technology, United States; North Carolina State University-Raleigh, United States; North Carolina State University-Charlotte, United States

P6108 - Isolated Flyback Half-Bridge OCC Micro-Inverter
Alexander Abramovitz, Mojtaba Heydari, Ben Zhao, Keyue Smedley, University of California-Irvine, United States

Poster Session: Selected Topics in Control of Power Converters
Room: Exhibit Hall C - South
Chair: Luca Zarri, Brian Welchko

P6301 - Optimal Algorithm of a Novel Infinite Impulse Response Digital Filter
Liqing Tong, Fangzheng Peng, Fudan University, China; Michigan State University, United States

P6302 - Output Impedance Analysis of Digitally Controlled DC-DC Converter
Hua Wang, Hua Lin, Xing Li, Xingwei Wang, Huazhong University of Science and Technology, China

P6303 - An Iteration Method for Determining Critical Stable Regions of Shunt Regulator with Multistage Hysteresis Control and its Complex Behaviors
Hong Li, Jianing Shang, Xiaojie You, Shiheng Wang, Beijing Jiaotong University, China; State Grid Beijing Changping Electric Power Supply, China

P6304 - An Analysis of False Turn-on Mechanism on Power Devices
Akihiro Nishigaki, Hirokatsu Umegami, Fumiya Hattori, Wilmar Martinez, Masayoshi Yamamoto, Shimane University, Japan

P6305 - PQ, DQ and CPT Control Methods for Shunt Active Compensators – A Comparative Study
Ali Mortezaei, Christopher Lute, M. Godoy Simões, Fernando P. Marafôa, Alessandro Bogila, Colorado School of Mines, United States; UNESP, Brazil

P6306 - Comparison of the Gate Drive Parameter Space for Driving Power MOSFETs using Conventional and Cascode Configurations
Mark A.H. Broadmeadow, Geoffrey R. Walker, Gerard F. Ledwich, Queensland University of Technology, Australia
P6307 - Reduced-Order Multifrequency Averaging in Naturally Sampled PWM Converters
Fei Pan, Aaron M. Cramer, University of Kentucky, United States

P6308 - Stability Analysis and Voltage Control Method based on Virtual Resistor and Proportional Voltage Feedback Loop for Cascaded DC-DC Converters
Wen Cai, Babak Fahimi, Eva Cosoroaba, Fan Yi, University of Texas at Dallas, United States

P6309 - Control and Modulation of the Stacked Polyphase Bridges Inverter
Lebing Jin, Staffan Norrga, Oskar Wallmark, Majgan Nikouei Harnefors, KTH Royal Institute of Technology, Sweden

P6310 - Digitally Controlled Switch-Mode Power Driver for Active Magnetic Bearings
Tomer Ben Moha, Sergei Basovich, Mor Mordechai Peretz, Shai Arogeti, Ziv Brand, Ben-Gurion University of the Negev, Israel

P6311 - Modular Interleaved Single-Phase Series Voltage Injection Converter used in Small-Signal dq Impedance Identification
Jaksic Marko, Boroyevich Dushan, Burgos Rolando, Mattavelli Paolo, Shen Zhiyu, Cvetkovic Igor, Virginia Tech, United States; University of Padova, Italy

Poster Session: Reliability and Fault Diagnostics in Power Converters
Room: Exhibit Hall C - South
Chair: Luca Zarri, Brian Welchko

P6501 - Duty Cycle-based Start-Up Control for a ZVS Bidirectional DC-DC Converter
Chi Xu, Hongbin Yu, Yunjie Gu, Pengfei Sun, Wuhua Li, Xiangning He, Fengwen Cao, Zhejiang University, China; Suzhou Vocational University, China

P6502 - Reliability Evaluation Model of Wind Power Converter System Considering Variable Wind Profiles
Hui Li, Haiting Ji, Yang Li, Shengquan Liu, Dong Yang, Xing Qin, Li Ran, Chongqing University, China; Chongqing Three Gorges University, China

P6503 - Condition Monitoring and Failure Prognosis of IGBT Inverters based on On-Line Characterization
Andrew Babel, Annnette Muetze, Roland Seebacher, Klaus Krischan, Elias G. Strangas, Michigan State University, United States; Graz University of Technology, Austria

P6504 - Reliability and Energy Loss in Full-Scale Wind Power Converter Considering Grid Codes and Wind Classes
Dao Zhou, Frede Blaabjerg, Toke Franke, Michael Tonnes, Mogens Lau, Aalborg University, Denmark; Danfoss Silicon Power GmbH, Germany; Siemens Wind Power A/S, Denmark

P6505 - Suppression of Real Power Back Flow of Non-Regenerative Cascaded H-Bridge Inverters Operating under Faulty Conditions
Le Sun, Zhenxing Wu, Fei Xiao, Xinjian Cai, Xi’an Jiaotong University, China; Naval University of Engineering, China

P6506 - Wide Bandwidth and Low Propagation Time Delay Current Sensor applied to a Laminated Bus Bar
Keiji Wada, Atsushi Yamashita, Tokyo Metropolitan University, Japan

P6507 - Comparison and Design of InterCell Transformer Structures in Fault-Operation for Parallel Multicell Converters
Sébastien Sanchez, Damien Risaletto, Frédéric Richardeu, Guillaume Gateau, University of Toulouse, France

**P6508 - Dynamic Thermal Analysis of DFIG Rotor-Side Converter during Balanced Grid Fault**
Dao Zhou, Frede Blaabjerg, Aalborg University, Denmark

**WEST**

Poster Session: Machine Diagnostics
Room: Exhibit Hall C - West
Chair: Pinjia Zhang

**P6701 - Automatizing the Broken Bar Detection Process via Short Time Fourier Transform and Two-Dimensional Piecewise Aggregate Approximation Representation**
George Georgoulas, Petros Karvelis, Chrysostomos D. Stylios, Ioannis P. Tsoumas, Jose Alfonso Antonino-Daviu, Vicente Climente-Alarcon, Technological Institute of Epirus, Greece; Siemens Industry Sector-Drive Technologies, Germany; Universitat Politècnica de València, Spain

**P6702 - Detection of AC Machines Insulation Health State based on Evaluation of Switching Transients using Two Current Sensors and Eigenanalysis-based Parameter Estimation**
C. Zoeller, Th. Winter, Th. Wolbank, M. Vogelsberger, Vienna University of Technology, Austria; Bombardier Transportation Austria GmbH, Austria

**P6703 - Fault Diagnosis of Wind Turbine using Control Loop Current Signals**
Jun Hang, Jianzhong Zhang, Ming Cheng, Southeast University, China

**P6704 - Diagnosis of Stator Winding Short-Circuit Faults in an Interior Permanent Magnet Synchronous Machine**
Jiangbiao He, Chad Somogyi, Andrew Strandt, Nabeel A.O. Demerdash, Marquette University, United States

**P6705 - Detecting Faults in Inverter-Fed Induction Motors during Startup Transient Conditions**
M. Dlamini, P.S. Barendse, A.M. Khan, University of Cape Town, South Africa

Poster Session: Machines for Automotive and Renewable Energy Applications
Room: Exhibit Hall C - West
Chair: Julia Zhang

**P6901 - A Novel Magnetic Lead Screw Active Suspension System for Vehicles**
Nick Ilsoe Berg, Rasmus Koldborg Holm, Peter Omand Rasmussen, Aalborg University, Denmark

**P6902 - Design of an Outer Rotor Ferrite Assisted Synchronous Reluctance Machine (Fa-SynRM) for Electric Two Wheeler Application**
Yateendra Deshpande, Hamid A. Toliyat, Texas A&M University, United States

**P6903 - Investigation and Development of a New Brushless DC Generator System for Extended-Range Electric Vehicle Application**
Zhuoran Zhang, Li Yu, Chao Dai, Yangguang Yan, Nanjing University of Aeronautics and Astronautics, China

**P6904 - Dynamic Modeling of the Trans-Rotary Magnetic Gear for the Point-Absorbing Wave Energy Conversion Systems**
Siavash Pakdelian, Hamid A. Toliyat, Texas A&M University, United States
P7101 - Efficiency Improvement in Motor Drive System with Single Phase Diode Rectifier and Small DC-Link Capacitor
Yeongrack Son, Jung-Ik Ha, Seoul National University, Korea

P7102 - Ground Fault Location Self-Diagnosis in High Resistance Grounding Drive Systems
Jiangang Hu, Lixiang Wei, Jeffrey McGuire, Zhijun Liu, Rockwell Automation Inc., United States

P7103 - Single to Two-Phase Matrix Converter using GaN-based Monolithic Bidirectional Switch for Driving Symmetrical Two-Phase Motor
Yuji Kudoh, Kenji Mizutani, Nobuyuki Otsuka, Satoru Takahashi, Masahiko Inamori, Hirota Yamagiwa, Tatsuo Morita, Tetsuzo Ueda, Tsuyoshi Tanaka, Daisuke Ueda, Toshimitsu Morizane, Panasonic Corporation, Japan; Kyoto Institute of Technology, Japan; Osaka Institute of Technology, Japan

P7104 - Low-Power Energy Conversion Systems with Two-Phase PM Machine and a Rectifier with Reduced Number of Controlled Switches
Cursino B. Jacobina, Victor F.M.B. Melo, Filipe A. da C. Bahia, Italo Roger F.M.P. da Silva, Federal University of Campina Grande, Brazil

P7105 - High Fidelity Nonlinear IPM Modeling based on Measured Stator Winding Flux Linkage
Dakai Hu, Yazan Alsmaidi, Longya Xu, Ohio State University, United States

P7106 - Rogowski Current Sensor Design and Analysis based on Printed Circuit Boards (PCB)
Ruxi Wang, Satish Prabhakaran, William Burdick, Raymond Nicholas, General Electric Global Research, United States

P7107 - A Capacitor-Less Gate Drive Circuit using Two Parasitic Capacitors Suitable for Non-Insulating-Gate GaN FETs
Masataka Ishihara, Fumiya Hattori, Hirokatsu Umegami, Masayoshi Yamamoto, Shimane University, Japan

P7108 - Optimal Energy Saving Trajectories of Induction Motor with Suppression of Sudden Acceleration and Deceleration
Kaoru Inoue, Yuji Asano, Keito Kotera, Toshiji Kato, Doshisha University, Japan

P7109 - A High-Performance 2x27 MVA Machine Test Bench based on Multilevel IGCT Converters
Jie Shen, Stefan Schröder, Bo Qu, Yingqi Zhang, Kunlun Chen, Fan Zhang, Yulong Li, Yan Liu, Peng Dai, Richard Zhang, GE Global Research, Germany; GE Global Research, China; GE Power Conversion, China

P7110 - Performance Evaluation of Current Control Strategies in LCL-Filtered High-Power Converters with Low Pulse Ratios
Jingkui Shi, Jie Shen, Qingyun Chen, Stefan Schröder, Hanno Stagge, Rik W. De Doncker, GE Global Research, China; GE Global Research, Germany; Aachen, Germany

P7111 - Analysis and Design of Active Inductor as DC-Link Reactor for Lightweight Adjustable Speed Drive Systems
Dibyendu Rana, Bahaa Hafez, Pawan Garg, Somasundaram Essakiappan, Prasad Enjeti, Texas A&M University, United States

P7112 - A Novel Hysteresis Current Control Switching Method for Torque Ripple Minimization in Multi-Phase Motors
Jae-Bum Park, Matthew Johnson, Hamid A. Toliyat, Texas A&M University, United States

P7113 - Development of Integrated Bi-Directional Inverter for Switched Reluctance Motor Drive
Jianing Liang, Ming Chang, Guoqing Xu, Chinese Academy of Sciences, China; The Chinese University of Hong Kong, Hong Kong; Tongji University, China

P7114 - Influence of Machine Integration on the Thermal Behavior of a PM Drive for Hybrid Electric Traction
Christian Paar, Hendrik Kolbe, Annette Muetze, Magna Powertrain AG & Co KG, Austria; Graz University of Technology, Austria