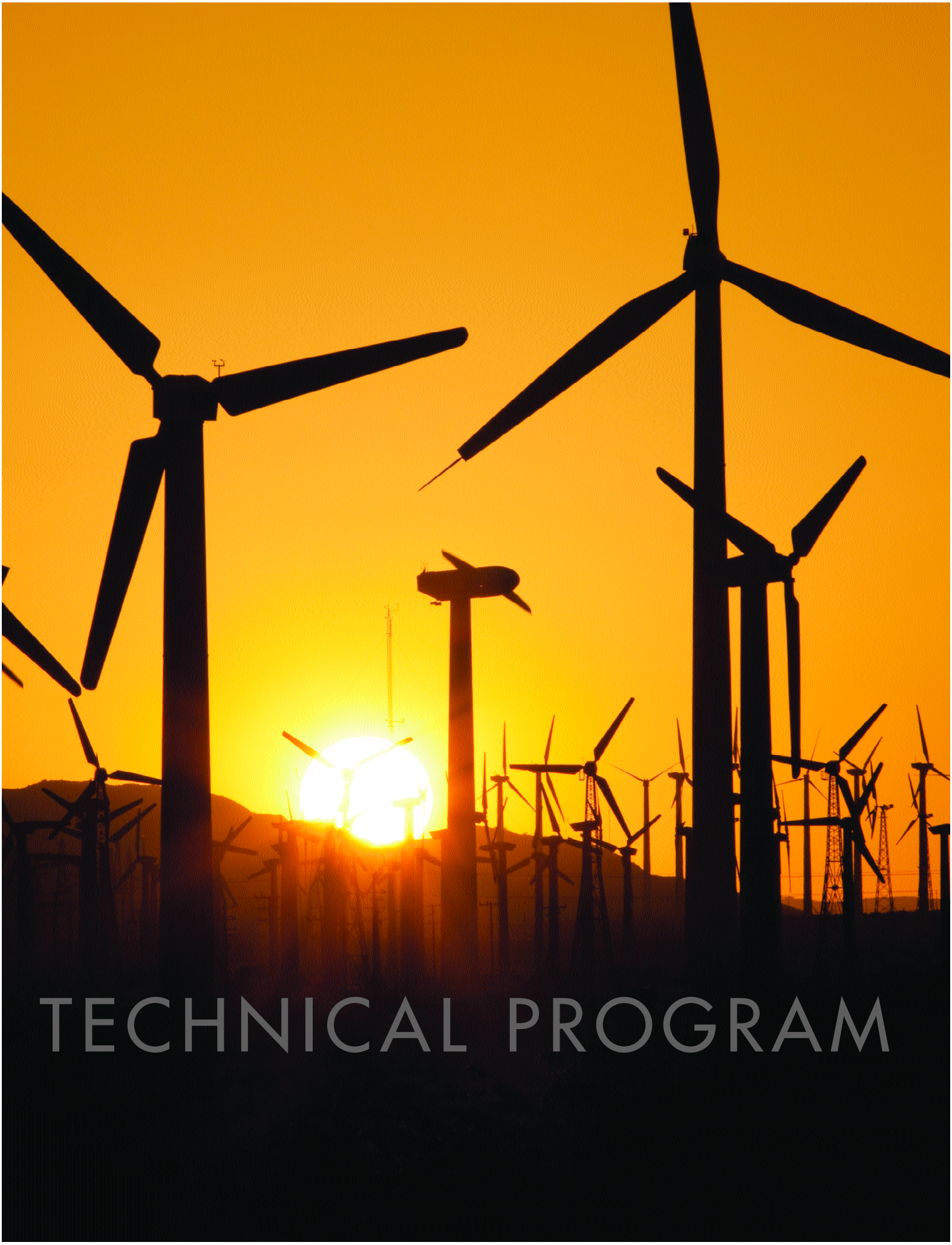


TECHNICAL PROGRAM

Monday, September 21, 2009
10:45AM-12:00PM

Session S2-1: Inverter Control
SECOND LEVEL, CEDAR
Chair: P. Zanchetta, University of Nottingham, UK

10:45AM Predictive Current Control of Grid-Connected DC-AC Converters During Network Unbalance
Jiabing Hu, Yikang He, Heng Nian and Hongsheng Wang
Zhejiang University, China

11:10AM Flux Estimation Techniques for Inrush Current Mitigation of Line Interactive UPS systems
Yu-Hsing Chen and Po-Tai Cheng
National Tsing Hua University, Taiwan

11:35AM A Hybrid Control Method for Three-Phase Grid-Connected Inverters with High Quality Power
Zitao Wang and Liuchen Chang
University of New Brunswick, Canada

Session S2-2: dc-dc Converter Topologies
SECOND LEVEL, PINE
Chair: W. Peterson, E&M Power, USA

10:45AM Comparison of Two Different Cell Topologies for a Multilevel Power Supply to achieve High Efficiency Envelope Amplifier
Daniel Diaz, Miroslav Vasic, Pedro Alou, Oscar Garcia, Jesus A. Oliver, and Jose A. Cobos
Universidad Politecnica de Madrid, Spain

11:10AM Three Level Buck Converter with Control and Startup
David Reusch, Ming Xu and Fred C. Lee
Virginia Tech, United States

11:35AM Digitally Controlled Distributed Multiphase DC-DC Converters
Xu Zhang, Luca Corradini and Dragan Maksimovic
University of Colorado at Boulder, United States

Session S2-3: Inverters for Solar Energy Systems
LOWER LEVEL, SAN JOSE/SANTA CLARA
Chair: Y-S Suh, Chonbuk National University, South Korea

10:45AM Modeling and Control of the Single-Phase Photovoltaic Grid-Connected Cascaded H-Bridge Multilevel Inverter
S. J. Lee, H. S. Bae and Bo Hyung Cho
Seoul National University, Korea (South)

11:10AM New MPPT Algorithm for Photovoltaic Systems Connected to NPC Converters
Manuel Galvez, Emilio Bueno, Francisco J. Rodriguez, Francisco J. Meca and Ana Rodriguez
Alcala University, Spain; University of Alcala, Spain

11:35AM A Single Phase Curren Source Solar Inverter with Reduced DC Link and Improved Maximum Power Point Tracking
Craig Bush and Bingsen Wang
Arizona State University, United States

Session S2-4: dc-dc Converters for Distributed Generation Systems
LOWER LEVEL, CARMEL/MONTEREY
Chair: B. Ozpineci, Oak Ridge National Laboratory, USA

10:45AM Novel Bidirectional DC-DC Converter with High Step-Up/Down Voltage Gain
Ci-Ming Hong, Lung-Sheng Yang, Tsorng-Juu Liang and Jiann-Fuh Chen
National Cheng-Kung University, Taiwan

11:10AM High-Efficiency DC-DC Converter for Fuel Cell Applications: Performance and Dynamic Modeling
Oday Ahmed and J.A.M. Bleijs
University of Leicester, United Kingdom

11:35AM A Dual-Active-Bridge DC/DC Converter for Single-Phase Distributed Generators
Jaehong Kim, Kwanghee Nam and Ilsu Jeong
POSTECH, Korea (South)

Session S2-5: Inverter PWM and Control Techniques
LOWER LEVEL, SAN MARTIN/SAN SIMEON
Chair: K. Matsuse, Meiji University, Japan

10:45AM Dead-Time Elimination Method and Current Polarity Detection Circuit without Separate Power Sources for Three-Phase Inverter
Yong-Kai Lin and Yen-Shin Lai
National Taipei University of Technology, Taiwan

11:10AM Enhanced Three Phase AC Stationary Frame PI Current Regulators
Wang Y. Kong, D. Grahame Holmes and Brendan P. McGrath
Monash University, Australia

11:35AM Asymmetric Interleaving - A New Approach to Operating Parallel Converters
Troy Beechner and Jian Sun
Rensselaer Polytechnic Institute, United States

Session S2-6: Wide-Bandgap Semiconductors and Applications
LOWER LEVEL, SAN CARLOS/SAN JUAN
Chair: E. Santi, University of South Carolina, USA

10:45AM Roadmap for Megawatt Class Power Switch Modules Utilizing Large Area Silicon Carbide MOSFETs and JBS Diodes
Jim Richmond, Scott Leslie, Brett Hull, Mrinal Das, Anant Agarwal and John Palmour
Cree Inc., United States; Powerex Inc, United States

11:10AM 20 A, 1200 V 4H-SiC DMOSFETs for Power Conversion Systems
Brett Hull, Mrinal Das, Fatima Husna, Robert Callanan, Anant Agarwal, and John Palmour

11:35AM Investigation on Inherently Safe Gate Drive Techniques for Normally-On Wide Bandgap Power Semiconductor Switching Devices
Mi Dong, John Elmes, Michael Pepper, Issa Batarseh and Z. John Shen
University of Central Florida, United States

Session S2-7: PM Machines: Design, Analysis, and Optimization
SECOND LEVEL, FIR
Chair: D. Ionel, AO Smith, USA

10:45AM Analysis of Slanted Air-gap Structure of Interior Permanent Magnet Synchronous Motor with Brushless Field Excitation
Seong T. Lee and Leon Tolbert
The University of Tennessee, United States; Oak Ridge National Laboratory, United States

11:10AM Torque Ripple Reduction of Axial Flux Permanent Magnet Synchronous Machines with Segmented and Laminated Stator
Weizhong Fei and Patrick Luk
Cranfield University, United Kingdom

11:35AM Rotor Saliency Improved Structural Design For Cost Reduction in Single-phase Line-Start Permanent Magnet Motor
Liang Fang, Byeong-Hwa Lee, Jung-Pyo Hong and Hyuk Nam
Hanyang University, Korea (South); LG Electronics Inc., Korea (South)

Session S2-8: Induction Motor Drives
SECOND LEVEL, OAK
Chair: G. Capolino, University of Picardie, France

10:45AM Flux Weakening Strategy of an Induction Machine Driven by an Electrolytic Capacitor-less Inverter
Anno Yoo, Seung-Ki Sul, Sunja Kim and Kyung-Seo Kim
Seoul National University, Korea (South); LS Industrial System Co., Korea (South)

11:10AM Reduced-Order Flux Observers with Stator-Resistance Adaptation for Speed-Sensorless Induction Motor Drives
Marko Hinkkanen, Lennart Harnefors and Jorma Luomi
Helsinki University of Technology, Finland; ABB Power Systems, Sweden

11:35AM A Design Methodology of an Optimal Torque Minimizing Energy Loss Under Torque Limit for an Induction Motor
Kaoru Inoue, Masatoshi Minamiyama and Toshiji Kato
Doshisha University, Japan

Monday, September 21, 2009
1:30PM-3:15PM
Lower Level, Bayshore Foyer, Exhibit Hall

POSTER SESSION P3-1: DC-DC CONVERTERS
Chair: H. Gao, Montana State University, USA

P901 Mix-Voltage Conversion for Single-Inductor Dual-Output Buck Converters
Chun-Shih Huang, Dan Chen and Kuang-Hua Liu
National Taiwan University, Taiwan; Green Mark Inc., Taiwan

P902 A Unified Small Signal Analysis of DC-DC Converters with Average Current Mode Control
Ruqi Li, Tony O'Brien, John Lee and John Beecroft
Cisco, Inc., United States

P903 Monolithic DC Offset Self-Calibration Method for Adaptive On-time Control Buck Controller
Xin Zhou, Jiwei Fan and Alex Huang
North Carolina State University, United States

P904 Design of a Transient Voltage Clamp (TVC) for 4 Switch Buck Boost (4SBB) Converter
Sungkeun Lim and Alex Huang
North Carolina State University, United States

P905 The Input Voltage Sharing Control Strategy for Input-Series and Output-Parallel Converter under Extreme Conditions
Hong Yan, Xinbo Ruan and Wu Chen
Nanjing University of Aeronautics and Astronautics, China

P906 Zero-Voltage Switching Post Regulation Scheme for Multi-output Forward Converter with Synchronous Switches
Jae-Kuk Kim, Choi Seong-Wook and Gun-Woo Moon
KAIST, Korea (South)

P907 A New Family of Isolated Two-stage Converter
Xiaogao Xie, Yong Ni, Shuang Yao and Xiaodong Zhao
Hangzhou Dianzi University, China; Zhejiang Institute of Mechanical and EE, China; Zhejiang university, China

P908 Multi-loop Buck Regulator Design for Wide Programmable Switching Frequency
Tuli Dake, Anand Chellamuthu, Sam Patel and Erhan Ozalevli
Texas Instruments, United States

P909 Passive Lossless Snubber Cell with Minimum Stress and Wide Operating Range
River T. H. Li and Henry S.H. Chung
City University of Hong Kong, Hong Kong

P910 Isolated ZVS Two-Transformer Boost Converter
Ki-Bum Park, Chong-Eun Kim, Duk-You Kim, Gun-Woo Moon and Myung-Joong Youn
KAIST, Korea (South); Samsung Electro-Mechanics, Korea (South)

P911 Zero-Voltage Switching Dual Inductor-fed DC-DC Converter for High Power Step-up Applications
Hyun-Wook Seong, Ki-Bum Park, Gun-Woo Moon and Myung-Joong Youn
KAIST, Korea (South)

P912 A Novel Bidirectional Multilevel Boost-Buck Dc-Dc Converter
Sergio Busquets-Monge, Salvador Alepuz and Josep Bordonau
Technical University of Catalonia, Spain

P913 Novel On-line Parameter Tuning Technique for Predictive Current Mode Control Operating in Boundary Conduction Mode
Ye-Then Chang and Yen-Shin Lai
National Taipei University of Technology, Taiwan

P914 Active Cancellation of Capacitor ESR and ESL Effects for Improving Converter Transient and Steady-state Response
Henry S.H. Chung and Wai-to Yan
City University of Hong Kong, Hong Kong

P915 Optimized Operating Mode of Current-fed Dual Half Bridges DC-DC Converters for Energy Storage Applications
Zhan Wang and Hui Li
Florida State University, United States

POSTER SESSION P3-2: RESONANT AND SOFT-SWITCHED CONVERTERS
Chair: B. McGrath, Monash University, Australia

P1101 Novel Synchronous Rectifier Driving Scheme for LLC Converter with Primary Current Sensing
Xinke Wu, Baohong Li, Rongxiang Zhao and Zhaoming Qian
Zhejiang University, China; Dalian Jiaotong University, China

P1102 LLC Resonant DC/DC Converter with Current-Driven Synchronized Voltage-Doubler Rectifier
Guoxing Zhang, Junming Zhang, Chen Zhao, Xinke Wu and Zhaoming Qian
Zhejiang University, China

P1103 Load Sharing Characteristic of Two-Phase Interleaved LLC Resonant Converter with Parallel and Series Input Structure
Bong-Chul Kim, Ki-Bum Park, Chong-Eun Kim and Gun-Woo Moon
KAIST, Korea (South); Samsung Electro-Mechanics, Korea (South)

P1104 A Simple and Novel Two Phase Interleaved LLC Series Resonant Converter Employing a Phase of the Resonant Capacitor
Kang-Hyun Yi, Bong-Chul Kim and Gun-Woo Moon
KAIST, Korea (South)

P1105 Dynamic Analysis and Control Design of Optocoupler-Isolated LLC Series Resonant Converters with Wide Input and Load Variations
Jinhaeng Jang, Minjae Joung, Byungcho Choi and Heung-geun Kim
LG Electronics, Korea (South); Kyungpook National University, Korea (South)

P1106 A Novel Primary Current Detecting Concept for Synchronous Rectified LLC Resonant Converter
Chen Zhao, Baohong Li, Jing Cao, Yue Chen, Xinke Wu and Zhaoming Qian
Zhejiang University, China; Dalian Jiaotong University, China; Zhejiang SUPCON Instrument co., LTD, China

P1107 Analysis and Design of LLC Resonant Converter Considering Rectifier Voltage Oscillation
Ki-Bum Park, Bong-Chul Kim, Byoung-Hee Lee, Chong-Eun Kim, Gun-Woo Moon and Myung-Joong Youn
KAIST, Korea (South)

P1108 Comparison of Inductor-Half-Bridge and Class-E Resonant Topologies for Piezoelectric Transformer Applications
Yujia Yang, Fabio Bisogno, Andressa Schittler, Matthias Radecker, Sadachai Nittayarumphong, Wolf-Joaehim Fischer and Marc Fahlenkamp
Fraunhofer Institut IZM, Germany; Santa Maria Federal University, Brazil; Fraunhofer Institut IAIS, Germany

P1109 Feedforward Plus Feedback Control of the Improved Z-source Inverter
Yu Tang, Shaojun Xie and Chaohua Zhang
Nanjing University of Aero. and Astro., China

P1110 Envelope Modeling and Small-Signal Analysis of a PWM-Controlled Parallel Resonant Inverter for Electronic Ballast Applications
Christian Branas, Francisco J. Azcondo and Rosario Casanueva
University of Cantabria, Spain

P1111 Unified Steady-State Description of Phase-Shift-Controlled ZVS-Operated Series-Resonant and Non-Resonant Single-Active-Bridge Converters
Robert U. Lenke, Jiefang Hu and Rik W. De Doncker
RWTH Aachen University, Germany

P1112 High Switching Frequency, High Efficiency CLL Resonant Converter with Synchronous Rectifier
Daocheng Huang, Dianbo Fu and Fred C. Lee
Virginia Tech, United States

P1113 The Evaluation of Control Strategies for Auxiliary Resonant Commutated Pole Inverter
Ke Ma, Dehong Xu, Tao Zhang and Seiki Igarashi
Zhejiang University, China; Fuji Electric Device Technology Co., Ltd, Japan

P1114 Simplified ZVT Circuits Applied to Bidirectional Poles: Concept and Synthesis Methodology
Rafael Concatto Beltrame, Jonatan Rafael Rakoski Zientarski, Mario Lucio da Silva Martins, Jose Renes Pinheiro and Helio L. Hey
Federal University of Santa Maria, Brazil; Federal University of Technology - Parana, Brazil

P1115 A Constant Frequency Series-Parallel Resonant Converter with Dual-Edge PWM to Implement Secondary-Side Control
Darryl J. Tschirhart and Praveen K. Jain
Queen's University, Canada

P1116 Dynamic Performance of a Current-Phase Control Method for Zone-Control Induction Heating Systems
Ha Pham Ngoc, Fujita Hideaki, Ozaki Kazuhiro and Uchida Naoki
Tokyo Institute of Technology, Japan; Mitsui Engineering. and Shipbuilder Co., LTD., Japan

P1117 A New AC Processing Pickup for IPT Systems
Hunter Wu, John Boys, Grant Covic, Saining Ren and Patrick Hu
The University of Auckland, New Zealand; University of Auckland, New Zealand

P1118 A Novel Three-level Zero-Current Transition Active Neutral-Point-Clamped Inverter
Jin Li, Jinjun Liu and Zeng Liu
Xi'an Jiaotong University, China

P1119 Soft Switching Schemes for Multiphase DC/DC Converter with Six-pulse Modulated Pulsating Output
Rongjun Huang and Sudip K. Mazumder
University of Illinois Chicago, United States

POSTER SESSION P3-3: INVERTERS AND RECTIFIERS
Chair: F. Khan, University of Utah, USA

P1301 Harmonic Losses of Multi-Phase PWM Inverter-Fed Drives
Drazen Dujic, Emil Levi and Martin Jones
Liverpool John Moores University, United Kingdom

P1302 Analysis and Compensation Method of Voltage Error by Dead-Time with Five-Leg Inverter for Two-AC Motor Independent Drives
Oka Kazuo, Enokijima Hiroyuki, Kubota Hisao and Matsuse Kouki
Meiji University, Japan

P1303 Novel PWM Technique with Switching-Loss Reduction in Five-Leg Inverter for Independent Drives of Two 3-Phase AC Motors
Kazuo Oka, Nobutaka Kezuka, Ichiro Miki and Kouki Matsuse
Meiji University, Japan

P1304 A Novel Space Vector Modulation for Nine-Switch Converters
Seyed Mohammad Dehghan, Mustafa Mohamadian, Ali Yazdian and Farhad Ashrafzadeh
Tarbiat Modares University, Iran; Whirlpool Corporation, United States

P1305 On Zero Steady-State Error of Single-Phase PWM Inverters Voltage Control and Phase-Locked Loop System
Dong Dong, Timothy Thacker, Rolando Burgos, Dushan Boroyevich and Fred Wang
Virginia Tech, United States

P1306 Analysis of PWM Frequency Control to Improve the Lifetime of PWM Inverter
Lixiang Wei, Jeffrey McGuire and Richard Lukaszewski
Rockwell Automation, United States; Rockwell Automation - Allen Bradley, United States

P1307 Control Strategy of Achieving Input Voltage Sharing and Output Voltage Sharing for Input-Series-Output-Series Inverters System
Tianzhi Fang, Xinbo Ruan and Chi K. Tse
Nanjing Univ. of Aeronautics and Astronautics, China; The Hong Kong Polytechnic University, Hong Kong

P1308 Bi-Directional Grid-Tied Inverter with Predictive Current Control
Yaow-Ming Chen, Kuan-Yu Liu, Shih-Kai Chiang and Yung-Ruei Chang
National Taiwan University, Taiwan; National Chung Cheng University, Taiwan; Inst. of Nuclear Energy Research, Taiwan

P1309 The PWM Strategies of Grid-connected Distributed Generation Active NPC Inverters
Lin Ma, Tamas Kerekes, Remus Teodorescu, Pedro Rodriguez, Xinmin Jin and Marco Liserre
Beijing Jiao Tong University, China; Aalborg University, Denmark; Technical University of Catalonia, Spain; Elettronica Politecnico di Bari, Italy

P1310 Grid-Tied Inverter with Current-Mode Asynchronous Sigma-Delta Modulation
Yaow-Ming Chen, Chia-Shi Chang and Kuan-Yu Liu
National Taiwan University, Taiwan

P1311 Output Voltage Switching Noise Peaks and Utility AC Input Harmonic Current Characteristics of Delta-Sigma Modulated AC-DC Converter with Boost-Buck Circuit Topologies
Atsushi Hirota, Sang-Pil Mun, Soon-Kurl Kwon and Mutsuo Nakaoka
Akashi National College of Technology, Japan; Kyungnam University, Korea (South); Kyungnam University/Yamaguchi Univ., Korea (South)

P1312 Passive Lossless Snubber with Minimum Voltage and Current Stress for Boost PFC
River T. H. Li, Anson Sung and Henry S.H. Chung
City University of Hong Kong, Hong Kong

P1313 Multistage Active-Clamp High Power Factor Rectifier with passive loss-less current sharing
Jose Villarejo, Esther De Jodar, Fulgencio Soto and Cava Moreno
Universidad Politecnica de Cartagena, Spain; Universidad de Murcia, Spain

P1314 A Novel AC-DC Single-Stage Converter for Low Power Applications
Navid Golbon and Gerry Moschopoulos
University of Western Ontario, Canada

P1315 Improved One-Cycle-Controlled Active Rectifiers with High-Order Input Filters
Yi Tang, Poh Chiang Loh, Peng Wang, Fook Hoong Choo and Kuan Khoon Tan
Nanyang Technological University, Singapore

P1316 Dc-bus Voltage Control of Three-phase AC/DC Converter Using Load Predictive Method
Zitao Wang and Liuchen Chang
University of New Brunswick, Canada

POSTER SESSION P3-4: COMPONENTS, MATERIALS, AND RELATED TOPICS
Chair: J. Hudgins, University of Nebraska, USA

P1501 A High-Speed H-Bridge Circuit Based on GaN HFETs and custom resonant gate drivers
Bo Wang, Antonello Monti and Marco Riva
University of South Carolina, United States; RWTH Aachen University, Germany; Universita degli Studi di Milano, Italy

P1502 Modeling Simulation and Validation of a SiC BJT
Tanya Gachovska, Bin Du, Jerry Hudgins, Enrico Santi, H. Alan Mantooth, Anant Agarwal, Angus Bryant and Alexander Grekov
Danfoss Electronic DRIVE, United States; University of Nebraska - Lincoln, United States; University of South Carolina, United States; University of Arkansas, United States; Cree Inc., United States; University of Warwick, United Kingdom

P1503 Physical Modelling of Large Area 4H-SiC PiN Diodes
Angus Bryant, Michael Jennings, Nii-Adotei Parker-Allotey, Philip Mawby, Amador Perez-Tomas, P. Brosselard, P. Godignou, X. Jorda, J. Millan, P.R. Palmer, E. Santi, and J.L. Hudgins
University of Warwick, United Kingdom; Centro Nacional de Microelectronica, Spain, Cambridge University, UK, University of South Carolina, USA, University of Nebraska, Lincoln

P1504 Design of AC Resonant Inductors Using Area Product Method
Marian Kazimierczuk and Hiroo Sekiya
Wright State University, United States

P1505 Multilayer Stacked Coreless Printed Spiral Winding Inductor with Wide Frequency Bandwidth
Chi Kwan Lee, Yi Peng Su and Shu Yuen (Ron) Hui
Hong Kong Polytechnic University, Hong Kong; Virginia Tech, United States; City University of Hong Kong, Hong Kong

P1506 Power Transformer Winding Positioning to Reduce Copper Losses: Non-sinusoidal Currents
Bernardo Cougo, Thierry Meynard, Francois Forest and Eric Laboure
Universite de Toulouse; INPT, UPS; LAPLACE, France; Universite de Montpellier 2, IES, France; LGEP, Supelec, France

P1507 Thermally Enhanced SMT Power Components
Ivan Josifovic, Jelena Popovic-Gerber and Jan Abraham Ferreira
Technical University of Delft, Netherlands

P1508 Effect of Capacitance on Eddy-Current Loss in Multi-Layer Magnetic Films for MHz Magnetic Components
Di Yao and Charles Sullivan
Thayer School of Engineering at Dartmouth, United States

P1509 PCB Integrated Transformer Composed with Mosaic Ferrite Blocks for LLC Resonant Converter
Jianing Wang, Xu Yang, Huapeng Niu, Zhao'an Wang and Jinjun Liu
Xi'an Jiaotong University, China

P1510 High-Power-Density Three-phase Converter Utilizing a Balanced-Flux Transformer Core
Jacobo Aguillon-Garcia, Gun-Woo Moon, Ki-Beoum Park and Bong-Chul Kim
KAIST, Korea (South)

P1511 Automatic Layout Optimization of a Double Sided Power Module Regarding Thermal and EMC constraints
Sylvain Mandray, Jean-Michel Guichon, Jean-Luc Schanen, Sebastien Vieillard and Arezki Bouzourene
G2ELab, France; Hispano Suiza, France; Thales AES, France

P1512 The Effect of Relative Humidity, Moisture, and Extreme Environmental Conditions on Power Electronic Performance
Rosa Ciprian and Brad Lehman
Diversified Technologies, Inc., United States; Northeastern University, United States

P1513 Characterization of Amorphous Iron Distribution Transformer Core for Use in High-Power Medium-Frequency Applications
Robert U. Lenke, Sebastian Rohde, Florian Mura and Rik W. De Doncker
RWTH Aachen University, Germany

P1514 A General Model to Predict the Iron Losses in Inverter Fed Induction Motors
Andrea Boglietti, Andrea Cavagnino, Mircea Popescu, Dan Ionel, Dave Staton and Silvio Vaschetto
Politecnico di Torino, Italy; Motor Design Ltd., United Kingdom; A.O. Smith Corp., United States

P1515 Modeling of Asymmetrical Cables for an Accurate Calculation of Common Mode Ground Currents
Oliver Magdun, Andreas Binder, Calin Purcarea, Alexander Rocks and Funieru Bogdan
Darmstadt University of Technology, Germany

P1516 Bearing Lifetime of Linear PM Machines
Johannes J.H. Paulides, Jeroen L.G. Janssen and Elena A. Lomonova
Eindhoven University of Technology, Netherlands

P1517 An Adaptive Noise-Cancellation Method for Detecting Generalized Roughness Bearing Faults under Dynamic Load Conditions
Bin Lu, Michael Nowak, Stefan Grubic and Thomas Habetler
Eaton Corporation, United States; Georgia Institute of Technology, United States

P1518 Bearing Damage Detection in Permanent Magnet Synchronous Machines
Mario Pacas, Ralf Dietrich and Sebastian Villwock
Universitaet Siegen, Germany; Baumueller Nuernberg, Germany

Monday, September 21, 2009
1:30PM-3:15PM
Second Level, Gateway Foyer

POSTER SESSION P3-5: MACHINES: MODELING, ANALYSIS, DESIGN AND APPLICATION
Chair: N. Bianchi, University of Padova, Italy

P101 An Analytical Determination of the Torque-speed and Efficiency-speed Characteristics of a BLDC Motor
Miroslav Markovic, Andre Hodder and Yves Perriard
EPFL, Switzerland

P102 Analytical Method of Torque Calculation for Interior Permanent Magnet Synchronous Machines
Seong T. Lee and Leon Tolbert
The University of Tennessee, United States; Oak Ridge National Laboratory, United States

P103 Finite Element Surrogate Model for Electric Machines with Revolving Field - Application to IPM Motors
Dan Ionel and Mircea Popescu
A.O. Smith Corp., United States; Motor Design Ltd., United Kingdom

P104 A Useful Multi-objective Optimization Design Method for PM Motors Considering Nonlinear Material Properties
Yao Duan, Ronald Harley and Thomas Habetler
Georgia Institute of Technology, United States

P105 Adaptation of the Classical DQ Method of Analysis Applied in Machines with Non-sinusoidal Distribution of Terminal Quantities
Beata Wawrzyniak and Pawel Witczak
Institute of Mechatronics and Information System, Poland

P106 Development of the DMPM-based Electrical Variable Transmission for HEV Drive
Tao Fan, Xuhui Wen, Haiying Meng, Feng Zhao, Jun Liu and Longya Xu
Institute of Electrical Engineering, China; AVIC Shanxi Aero Electric Co.Ltd, China; The Ohio State University, United States

P107 Rotor Pole Number Studies for Doubly Excited Brushless Machine
Longya Xu and Huijun Liu
The Ohio State University, United States

P108 Experimental Verification of Design Techniques of Permanent Magnet Synchronous Motors for Low Torque Ripple Applications
Mohammad Islam, Rakib Islam and Tomy Sebastian
Delphi Steering, United States

P109 Analysis of the Vibration Spectrum Based on the Input Voltage Spectrum
Laszlo Mathe, Uffe Jakobsen, Peter O. Rasmussen and John K. Pedersen
Institute of Energy Technology, Denmark

P110 Propositions for the Analysis of Commutation Phenomenon and the Modeling of Universal Motors Based on Introducing the State Function Method into FEM Electromagnetic Field Analysis
Yuta Niwa and Yuji Akiyama
Kanagawa Institute of Technology, Akiyama Lab., Japan

P111 Optimization for Capacitor-Driven Coilgun Based on Equivalent Circuit Model and Genetic Algorithm
Liuming Guo, Ningning Guo, Shuhong Wang, Jie Qiu, Jian Guo Zhu, Younguang Gou and Yi Wang
Xi'an Jiaotong University, China; University of Technology Sydney, Australia

P112 Sources and Characteristics of Unbalanced Magnetic Pull in 3-Phase Cage Induction Motors with Axial-Varying Rotor Eccentricity
David Dorrell
University of Technology Sydney, Australia

P113 A New Predictive Maintenance Technique Using Radial Flux Analysis to Determine Dirt in Railway Traction Motors
Miguel Gomez-Parra, Carlos Sancho, Pilar Munoz-Condes, M. Antonia G. San Andres, Francisco J. Gonzalez-Fernandez, Jose Carpio and Rafael Guirado
Metro de Madrid, Spain; UNED (Spanish Nat. Univ. for Distance Education), Spain

P114 Optimal Magnetic Design of the Stator Windings of Dual Stator Winding Squirrel-Cage Induction Machines
Zhiqiao Wu and Olorunfemi Ojo
Johnson Controls Inc., United States; Tennessee Technological University, United States

P115 A Two-Step Method for Estimating the Parameters of Induction Machine Models
Christopher Laughman, Steven Shaw, Steven Leeb, Leslie Norford and Peter Armstrong
Mitsubishi Electric Research Laboratories, United States; Montana State University, United States; Massachusetts Institute of Technology, United States; Masdar Institute of Science and Technology, United Arab Emirates

P116 Novel Two-Phase Switched Reluctance Motor with Hybrid Rotor Structure
Huijun Wang, Dong-Hee Lee and Jin-Woo Ahn
Kyungsung University, China; Kyungsung University, Korea (South)

P117 Modeling and Control of Novel Bearingless Switched Reluctance Motor
Dong-Hee Lee, Huijun Wang and Jin-Woo Ahn
Kyungsung University, Korea (South); Kyungsung University, China

P118 SR Drive for Hydraulic Pump Using a Novel Passive Boost Converter
Dong-Hee Lee, Seung-Hun Seok and Jin-Woo Ahn
Kyungsung University, Korea (South)

P119 Maximum Efficiency Drives of Synchronous Reluctance Motors by a Novel Loss Minimization Controller Considering Cross-Magnetic Saturation
Shu Yamamoto, John Adawey and Takahiro Ara
Polytechnic University, Japan; Polytechnic University, Philippines

P120 Development of a Claw Pole Permanent Magnet Motor with a Molded Low Density Soft Magnetic Composite Stator Core
Youguang Guo, Jianguo Zhu, David Dorrell, Haiyan Lu and Yi Wang
University of Technology Sydney, Australia

POSTER SESSION P3-6: SOLAR AND WIND ENERGY
Chair: M. Mao, Hefi University of Technology, China

P301 Investigation of Different Kinds of Photovoltaic Array Simulators Based on PWM Rectifier
Hongliang Liu, Mingzhi He, Xiaojie You and Trillion Q Zheng
Beijing Jiaotong University, China

P302 Maximum Power Point Tracking Method for PV Array Under Partially Shaded Condition
Young-Hyok Ji, Doo-Yong Jung, Chung-Yuen Won, Byoung-Kuk Lee and Jin-Wook Kim
SungKyunKwan Univ., Korea (South); SAMSUNG Electro-Mechanics CO.LTD, Korea (South)

P303 Transient Maximum Power Point Tracking for Single-stage Grid-tied Inverter
Ding Li, Feng Gao, Poh Chiang Loh, Peng Wang and Yi Tang
Nanyang Technological University, Singapore

P304 Design of a Photovoltaic Simulator with a Novel Reference Signal Generator and Two Stage LC Output Filter
Ahmed Koran, Kenichiro Sano, Rae-Young Kim and Jih-Sheng Lai
Virginia Tech, United States; Tokyo Institute of Technology, Japan

P305 High Efficient Interleaved Input-Series-Output-Parallel-Connected DC/DC Converter for Photovoltaic Power Conditioning System
Jong-Pil Lee, Byung-Duk Min, Tae-Jin Kim, Dong-Wook Yoo and Ji-Yoon Yoo
KERI, Korea (South); Korea University, Korea (South)

P306 Steady-state characterization of Multi-phase, Interleaved, DC-DC converters for Photovoltaic Applications
Sairaj Dhople, Ali Davoudi and Patrick Chapman
University of Illinois at Urbana-Champaign, United States

P307 Performance Evaluation and Simulation of a Solar Thermal Power Plant
Eduardo Ortiz-Rivera and Luisa Feliciano-Cruz
University of Puerto Rico-Mayaguez, Puerto Rico

P308 Study of a Simplified Model for DFIG-Based Wind Turbines
Kleber Lima, Alvaro Luna, Pedro Rodriguez, Edson Watanabe and Mauricio Aredes
Federal University of Rio de Janeiro, Brazil; Technical University of Catalonia, Spain

P309 A Phase-Modulated High-Frequency Isolated Dual LCL DC/AC Converter
Xiaodong Li and Ashoka Bhat
University of Victoria, Canada

P310 Complementary Half Controlled Converter for Directly-driven PM Synchronous Generator in Wind Power Generation Application
Heng Nian, Rong Zeng, Jiao Liu and Wei Zhang
Zhejiang University, China

P311 Control Methods for Low Voltage Ride-Through Compliance in Grid-Connected NPC Converter Based Wind Power Systems Using Predictive Control
Salvador Alepuz, Sergio Busquets-Monge, Josep Bordonau, Patricio Cortes and Samir Kouro
Technical University of Catalonia, Spain; Universidad Tecnica Federico Santa Maria, Chile; Ryerson University, Canada

P312 Control of DFIG-WT Under Unbalanced Grid Voltage Conditions
Alvaro Luna, Kleber Lima, Felipe Corcoles, Edson Watanabe and Pedro Rodriguez
Technical University of Catalonia, Spain; Federal University of Rio de Janeiro, Brazil; UPC, Spain

P313 Simulation Analysis of a Three-level NPC Based STATCOM Combined with TSC on a Wind Farm
Xiaohu Liu, Xinchun Lin, Yong Kang and Kevin Lee
Huazhong University of Science and Technology, China; Eaton Corporation, United States

P314 Grid-fault Tolerant Operation of DFIG Wind Turbine Generator Using a Passive Resistance Network
Xiangwu Yan, Giri Venkataramanan and Yang Wang
North China Electric Power University, China; University of Wisconsin-Madison, United States

P315 Reconfigurable Control and Converter Topologies for Wind Energy Systems with Switch Failure Fault Tolerance Capability
Arnaud Gaillard, Philippe Poure, Shahrokh Saadate and Serge Pierfederici
GREEN, France; IIEN, France

P316 Z-source Inverter with Grid Connected for Wind Power System
Uthane Supatti and Fang Z. Peng
Michigan State University, United States

P317 Output Maximization Control for DFIG Wind Turbines without Using Wind and Shaft Speed Measurements
Wei Qiao, Xiang Gong and Liyan Qu
University of Nebraska-Lincoln, United States

POSTER SESSION P3-7: APPLICATIONS OF POWER ELECTRONICS AND DRIVES
Chair: J. Clare, University of Nottingham, UK

P501 HIL Emulation of All-Electric UAV Power Systems
Rebecca Todd and Andrew Forsyth
The University of Manchester, United Kingdom

P502 Output Voltage Control of Synchronous Generator for Ships Using a PMG Type Digital AVR
Sang-Hoon Park, Jae-Sung Yu, Sang-Seuk Lee, Su-Won Lee and Chung-Yuen Won
Sungkyunkwan Univeristy, Korea (South); HYOSUNG Heavy Industries Co. Ltd., Korea (South); PACTECH, Korea (South)

P503 Novel Primary High Voltage Traction Converter Topology for Multi-system Locomotives
Pavel Drabek, Martin Pittermann and Marek Cedl
West Bohemia University in Pilsen, Czech Republic

P504 Main Problems and Proposed Solutions to Induction Machine Drive Control of Multisystem Locomotive
Zdenek Peroutka, Tomas Glasberger and Martin Janda
University of West Bohemia in Pilsen, Czech Republic

P505 Control of a Fuel Cell Hybrid Electric Motorcycle
Taehyung Kim, Oleg Vodyakho and Jefferson Yang
University of Michigan-Dearborn, United States; Florida State University, United States; Asia Pacific Fuel Cell Technologies, Taiwan

P506 A Power Flow Control Strategy for Optimal Fuel Efficiency of a Variable Speed Engine-Generator based Series Hybrid Electric Vehicle
Hyunjae Yoo, Byung-Geuk Cho, Seung-Ki Sul, Sang-Min Kim and Yongho Park
Seoul National University, Korea (South); Samsung Techwin Co. Ltd., Korea (South)

P507 Proposal of a Hybrid Rectifier Structure with HPF and Low THD Suitable for Front-End Trolleybusses Systems Supplied by AC Distribution Networks
Luiz C. de Freitas, Gustavo Brito Lima, Flavio Goncalves, Guilherme A. Melo and Carlos Canesin
Universidade Federal de Uberlandia, Brazil; Sao Paulo State University, Brazil

P508 High Level Decision Methodology for the Selection of a Fuel Cell Based Power Distribution Architecture for an Aircraft Application
Jesus A. Oliver, Pablo Zumel, Marina Sanz, Carmen Raga, Daniel Izquierdo, Oscar Garcia, Andres Barrado, Rober Prieto, Ricardo Azcona, Bernardo Delicado and Jose Antonio Cobos
Universidad Politecnica de Madrid, Spain; Universidad Carlos III de Madrid, Spain; EADS-CASA, Spain

P509 Near Unity Power-Factor Electronic Ballast Based on Integration Techniques to Drive High Intensity Discharge Metal Halide (HID-MH) Lamps
Andre Luiz Fuerback, Cicero da Silveira Postiglione, Arnaldo Perin and Claudinor Bitencourt Nascimento
Federal University of Santa Catarina, Brazil; Federal Technological University of Parana, Brazil

P510 A New Dimmable High Power Factor Electronic Ballast System for Compact Fluorescent Lamps (CFL) with Standard Incandescent Phase-cut Dimmers
John Lam and Praveen K. Jain
Queen's University, Canada

P511 A High Efficiency Linear Power Amplifier with Switch-Linear Hybrid Scheme
Xiaodong Liu, Sucheng Liu and Jingbo Kan
Anhui University of Technology, China

P512 ZVS Phase Shift Full Bridge Converter with Separated Primary Winding (SPW)
Young-Do Kim, Chong-Eun Kim, Kyu-Min Cho, Ki-Bum Park and Gun-Woo Moon
KAIST, Korea (South); Samsung Electro-Mechanics, Korea (South)

P513 A New Capacitor Charging Power Supply using Phase-Shifted PWM Full-Bridge Converter
Soo-Hong Kim, Byong-Seob Kim, Young-Duck Lee, Byung-Ki Kwon, Jae-Sik Kim, Chang-Ho Choi and Seung-Gap Choi
POSCON, Korea (South)

P514 A Control Strategy by Instantaneous Average Values for Parallel Operation of Single Phase Voltage Source Inverters Based in the Inductor Current Feedback
Telles Lazzarin, Guilherme Bauer and Ivo Barbi
Federal University of Santa Catarina, Brazil

P515 Multilevel Converter for Envelope Tracking in RF Power Amplifiers
Miguel Rodriguez, Pablo Fernandez, Alberto Rodriguez and Javier Sebastian
University of Oviedo, Spain

P516 A New Two-Switch Flyback Battery Equalizer with Low Voltage Stress on the Switches
Hyoung-Suk Kim, Ki-Bum Park, Sang-Hyun Park, Gun-Woo Moon and Myung-Joong Youn
KAIST, Korea (South)

P517 Compatibility Between GFCI Breakers and Household Adjustable Speed Drives
Jordan Henry and Jonathan Kimball
Missouri University of Science and Technology, United States

POSTER SESSION P3-8: POWER QUALITY, POWER SYSTEMS, AND RELATED TOPICS
Chair: S. Bhattacharya, North Carolina State University, USA

P701 Multi Induction Motor Connected Network Residual Voltage and it's Back Power
Yuji Akiyama and Yuta Niwa
Kanagawa Institute of Technology, Japan

P702 Optimal Allocation of Distributed Facts Devices in Power Networks for Relieving Congestion Using Particle Swarm Optimization
Debrup Das, Anish Prasai, Ronald Harley and Deepak Divan
Georgia Institute of Technology, United States

P703 Evaluation of Smoothing Effects of Autonomous Control of Microgrids on Line Flow Fluctuations at the Coupling Point with the Utility Grid
Eiichi Koda, Shigeru Bando and Hiroshi Asano
The University of Tokyo, Japan; Central Research Institute of Electric Power Ind, Japan

P704 High-Voltage-Input, Low-Voltage-Output, Series-Connected Converters with Uniform Voltage Distribution
Kasemsan Siri, Michael Willhoff, Haibing Hu and Issa Batarseh
The Aerospace Corporation, United States; University of Central Florida, United States

P705 Power System Stabilization by Fault Current Limiter and Thyristor Controlled Braking Resistor
Masaki Yagami and Junji Tamura
Hokkaido Institute of Technology, Japan; Kitami Institute of Technology, Japan

P706 Robust Controller Design for Inverter-Interfaced Distributed Generators Considering Islanded Operation of a Microgrid
Il-Yop Chung, Wenxin Liu, Siyu Leng, David Cartes and Emmanuel Collins
Florida State University, United States

P707 FPGA Implementation of a Sequence Separation Algorithm Based on a Generalized Delayed Signal Cancelation Method
Maria J. Diaz, Emilio Bueno, Helber Souza, Francisco A. S. Neves and Marcelo Cavalcanti
University of Alcala, Spain; Federal University of Pernambuco, Brazil

P708 Frequency Adaptive Phase-Sequence Separation Based on a Generalized Delayed Signal Cancellation Method
Helber Souza, Fabricio Bradaschia, Francisco A. S. Neves, Marcelo Cavalcanti and Mario Rizo
Federal University of Pernambuco, Brazil; Alcala University, Spain

P709 Proposal of a Resonant Controller for a Three Phase Four Wire Grid-Connected Shunt Hybrid Filter
Ignacio Candela, Pedro Rodriguez, Alvaro Luna, Remus Teodorescu and Frede Blaabjerg
Technical University of Catalonia, Spain; Aalborg University, Denmark

P710 Cost Effective Voltage Sag Mitigation using Square-Wave Series Compensators
Igor Amariz Pires and Braz de Jesus Cardoso
Universidade Federal de Minas Gerais, Brazil

P711 Analysis of Active Power Filters Operating with Unbalanced Loads
Leonardo Limongi, Daniel Roiu, Radu Bojoi and Alberto Tenconi
Politecnico di Torino, Italy

P712 Instantaneous Power Quantities in Polyphase Systems - A Geometric Algebra Approach
Hanoch Lev-Ari and Alex Stankovic
Northeastern University, United States

P713 Passive Harmonic Filter Design Scheme for Subsea Cable Application with 6-Pulse Variable Frequency Drives
Xiaodong Liang and Obinna Ilochonwu
Schlumberger, Edmonton Product Center, Canada

P714 Control Strategy for a High Efficiency Single Stage Converter
Hugo Ribeiro and Beatriz Borges
Instituto de Telecomunicacoes, IST, Lisboa, Portugal

P715 A Three-Phase Harmonic Decomposition Technique for Grid-Connected Converters
Davood Yazdani and Alireza Bakhshai
Queen's University, Canada

P716 Determination of Active and Reactive Powers in Multiphase Machines
Olorunfemi Ojo and Sosthenes Karugaba
Tennessee Technological University, United States

P717 FPGA Based Digital Implementation of Naturally Sampled Space Vector Modulation
Alexander Julian and Giovanna Oriti
Naval Postgraduate School, United States

P718 Fault Monitoring and Control of PEM Fuel Cell as Backup Power for UPS Applications
Yuedong Zhan, Hua Wang, Jianguo Zhu and Youguang Guo
Kunming University of Science and Technology, China; University of Technology Sydney, Australia

Monday, September 21, 2009 3:20PM-5:00PM

Session S4-1: Power Converter Modeling and Control

SECOND LEVEL, CEDAR
Chair: R. Burgos, Virgina Tech, USA

3:20PM Sequence-Based Control for Standalone and Networked Switching Power Converters
Sudip K. Mazumder and Kaustuva Acharya
University of Illinois Chicago, United States

3:45PM A Control Strategy for Multi-Phase Buck Converters under Dynamical Selection of Active Phases
Alejandro Pascual, Gabriel Eirea and Enrique Ferreira
Universidad de la Republica, Uruguay; Universidad Catolica del Uruguay, Uruguay

4:10PM A Heuristic Digital Control Method for Optimal Capacitor Charging
Mor Mordechai Peretz and Sam Ben-Yaakov
Ben-Gurion University, Israel

4:35PM Design Verification of Power Electronics Systems Subject to Bounded Uncertain Inputs
Eric Hope and Alejandro Dominguez-Garcia
University of Illinois at Urbana-Champaign, United States

Session S4-2: Resonant and Soft-Switching Converters

SECOND LEVEL, PINE
Chair: G. Hurley, NUI Galway, Ireland

3:20PM Multiple Output of Dual Half Bridge LLC Resonant Converter Using PFM-PD Control
Byeong Cheol Hyeon and Bo Hyung Cho
Seoul National University, Korea (South)

3:45PM Analysis and Design of Two-Phase Interleaved LLC Resonant Converter Considering Load Sharing
Bong-Chul Kim, Ki-Bum Park and Gun-Woo Moon
KAIST, Korea (South)

4:10PM Current Sharing in Three-Phase LLC Interleaved Resonant Converter
Enrico Orietti, Paolo Mattavelli, Giorgio Spiazzi, Claudio Adragna and Giuseppe Gattavari
DEI-University of Padova, Italy; DTG-University of Padova, Italy; ST Microelectronics, Italy

4:35PM Wide Range ZVS Active-Clamped L-L Type Current-Fed DC-DC Converter for Fuel-Cells to Utility Interface: Analysis, Design and Experimental Results
Akshay Rathore, Ashoka Bhat and Ramesh Oruganti
University of Wuppertal, Germany; University of Victoria, Canada; National Univ. of Singapore, Singapore

Session S4-3: Power Electronics in Renewable Energy Systems

LOWER LEVEL, SAN JOSE/SANTA CLARA
Chair: G. Holmes, Monash University, Australia

3:20PM Power Electronics, a Key Technology for Future More Electrical Energy Systems
Peter Steimer
ABB Ltd, Switzerland

3:45PM Indirect DC-Link Voltage Control of Two-Stage Single-Phase PV Inverter
Feng Gao, Ding Li, Poh Chiang Loh, Yi Tang and Peng Wang
Nanyang Technological University, Singapore

4:10PM Advances on Inter-Harmonic Variable-Frequency Injection-Based Grid-Impedance Estimation Methods Suitable for PV Inverters
Roberto Petrella, Alessandro Revelant and Piero Stocco
DIEGM - University of Udine, Italy

4:35PM Renewable Hybrid Systems using Biogas - Fuzzy Multi-Sets and Fuzzy Multi-Rules Analyses
Alexandre Barin, Luciane Neves Canha, Breno Wottrich, Karine Faverzani Magnago and Alzenira Abaide
Federal University of Santa Maria, Brazil; Delft University of Technology, Netherlands

Session S4-4: Power Converters for Transporation Applications

LOWER LEVEL, CARMEL/MONTEREY
Chair: J.Miller, Maxwell Tech., USA

3:20PM Evaluation of a Current Source Active Power Filter to Reduce the DC Bus Capacitor in a Hybrid Electric Vehicle Traction Drive
Shengnan Li, Burak Ozpineci and Leon Tolbert
The University of Tennessee, United States; Oak Ridge National Laboratory, United States

3:45PM Minimizing DC Capacitor Current Ripple and DC Capacitance Requirement of The HEV Converter/Inverter Systems
Xi Lu and Fang Z. Peng
Michigan State University, United States

4:10PM Performance Evaluation of Two StageMatrix Converters for EMA in Aircraft Applications
Andrew Trentin, Pericle Zanchetta, Patrick Wheeler and Jon Clare
University of Nottingham, United Kingdom

4:35PM Challenges of Traction Single-Phase Current-Source Active Rectifier
Jan Michalik, Jan Molnar and Zdenek Peroutka
University of West Bohemia in Pilsen, Czech Republic

Session S4-5: Three-Phase Rectifiers

LOWER LEVEL, SAN MARTIN/SAN SIMEON
Chair: D. Boroyevich, Virginia Tech, USA

3:20PM Three-Phase PFC Current Control Using DC-Rail Current as Feedback
Zhonghui Bing, Xiong Du and Jian Sun
Rensselaer Polytechnic Institute, United States

3:45PM A Simple Three-Phase Single-Stage AC-DC ZVZCS PWM Full-Bridge Converter
Dunisha Wijeratne and Gerry Moschopoulos
University of Western Ontario, Canada

4:10PM Evaluation of Alternate Soft Charge Circuits For Diode Front End Variable Frequency Drives
Mahesh Swamy, Tsuneo Kume and Nory Takada
Yaskawa Electric America, United States; Yaskawa Electric Corporation, Japan

4:35PM A Novel Hybrid 3-phase PWM Current Source Rectifier using SCRs and IGBTs
Lijie Jiang, Zhengyu Lu, Huiming Chen and Xinke Wu
Zhejiang University, China

Session S4-6: Converter Thermal and Protection Issues

LOWER LEVEL, SAN CARLOS/SAN JUAN
Chair: L. Wei, Rockwell Auto., USA

3:20PM Thermal Design Guideline of PCB Traces Under DC and AC Current
Yi Wang, Sjoerd de Haan and Jan Abraham Ferreira
Technical University of Delft, Netherlands

3:45PM 3-D Thermal Simulation of Power Module Packaging
Ian Swan, Angus Bryant, Nii-Adotei Parker-Allotey and Philip Mawby
University of Warwick, United Kingdom

4:10PM Power Device Reliability Assessment in High Pulsed Power Resonant Converters
Fabio Carastro, Jon Clare, Alberto Castellazzi, Mark Johnson, Michael Bland, and Patrick Wheeler
University of Nottingham, United Kingdom

4:35PM Design and Verification of a Simulation Model for Fuses with High-Breaking Capacity
Peter Koellensperger, Sebastian Boehm, Martin Hilscher, Peter Domanits and Volker Seefeld
Siemens AG, Germany

Session S4-7: Induction Machines

SECOND LEVEL, FIR
Chair: A. Consoli, University of Catania, Italy

3:20PM Impact of the Supply Voltage on the Stray Load Losses in Induction Motors
Aldo Boglietti, Andrea Cavagnino, Luca Ferraris and Mario Lazzari
Politecnico di Torino, Italy

3:45PM An Evaluation of Induction Machine Stray Load Loss from Collated Test Results
Emmanuel Agamloh
Advanced Energy Corporation, United States

4:10PM A Finite Element Procedure to Compute Variable Speed Induction Machine Performance
Luigi Alberti, Nicola Bianchi and Silverio Bolognani
University of Padova, Italy

4:35PM Equivalent Circuits for Single-sided Linear Induction Motors
Wei Xu, Jianguo Zhu, Youguang Guo, Yi Wang, Yongchang Zhang and Longcheng Tan
University of Technology Sydney, Australia; Chinese Academy of Sciences, China

Session S4-8: AC Machine Protection and Control Issues

SECOND LEVEL, OAK
Chair: T. Habetler, Georgia Tech, USA

3:20PM Magnet Temperature Estimation in Surface PM Machines Using High Frequency Signal Injection
David Reigosa, Fernando Briz, Pablo Garcia, Juan M. Guerrero and Michael Degner
University of Oviedo, Spain; Ford Motor Company, United States

3:45PM Experimental Analysis of Industry Standards on Derating of a Three-Phase Induction Motor due to Thermal Stress Caused by Voltage Unbalance
David Springer, Erik Stolz and Ernesto Wiedenbrug
United Launch Alliance, United States; Baker Instrument Company - an SKF Group Company, United States

4:10PM A Novel Motor Surge Voltage Suppression Method with Surge Energy Regeneration
Shimizu Toshihisa, Saito Mikiya and Nakamura Masanobu
Tokyo Metropolitan University, Japan; Oki Elecrtic CableCo., Ltd., Japan

4:35PM Discrete-time Current Regulator Design for AC Electric Machine Drives
Hongrae Kim, Michael Degner, Juan Guerrero, Fernando Briz and Robert Lorenz
ABB Inc., United States; Ford Motor Company, United States; University of Oviedo, Spain; University of Wisconsin - Madison, United States

Tuesday, September 22, 2009
8:30AM-10:10AM

Session S5-1a: Rectifiers and Power Quality Issues
SECOND LEVEL, CEDAR
Chair: N. Zargari, Rockwell Automation, Canada

8:30AM Ripple Steering AC-DC Converters to Minimize Input Filter
Frank Chen, Bruce Lu, Eric Chou and Adragna Claudio
STMicroelectronics, China; STMicroelectronics, Taiwan; STMicroelectronics, Italy

8:55AM Single Comparator Based A/D Converter for Output Voltage Sensing in Power Factor Correction Rectifiers
Barry Mather and Dragan Maksimovic
University of Colorado at Boulder, United States

9:20AM Non Linear Inductor Design for Improving Light Load Efficiency of Boost PFC
Shu Fan Lim and Ashwin M. Khambadkone
National University of Singapore, Singapore

9:45AM An Ac-Dc Single-Stage Full-Bridge PWM Converter with Bridgeless Input
Pritam Das, Ahmad Mousavi and Gerry Moschopoulos
University of Western Ontario, Canada

Session S5-2a: Advances in dc-dc Converters
SECOND LEVEL, PINE
Chair: A. Bhat, University of Victoria, Canada

8:30AM Dual-Bridge DC/DC Converter With Wide-Range ZVS and Zero Circulating Current
Zhong Ye
Texas Instruments Inc, United States

8:55AM A Current-Fed Three-Phase Half-Bridge DC-DC Converter with Active Clamping
Yujin Song, Soo-Bin Han, Suk-In Park, Hak-Geun Jeong and Bong-Man Jung
Korea Institute of Energy Research, Korea (South)

9:20AM Novel Dual Mode Operation of Phase-Shifted Full Bridge Converter to Improve Efficiency under Light Load Condition
Bo-Yuan Chen and Yen-Shin Lai
National Taipei University of Technology, Taiwan

9:45AM Analysis and Design for Paralleled Three-port DC/DC Converters with Democratic Current Sharing Control
Zhijun Qian, Osama Abdel-Rahman, Michael Pepper and Issa Batarseh
University of Central Florida, United States; Advanced Power Electronics Corporation, United States

Session S5-3a: Power Converters for Wind Energy Systems
LOWER LEVEL, SAN JOSE/SANTA CLARA
Chair: R. De Doncker, RWTH, Germany

8:30AM A Unified DC Link Current Control Scheme for Grid Fault Ride-Through in Current Source Converter Based Wind Energy Conversion Systems
Jingya Dai, Dewei Xu, Bin Wu and Navid Zargari
Ryerson University, Canada; Rockwell Automation, Canada

8:55AM A Low-Cost Rectifier Topology with Variable-Speed Control Capability for High-Power PMSG Wind Turbines
Jiacheng Wang, Dewei Xu, Bin Wu and Zhenhan Luo
Ryerson University, Canada

9:20AM Controller Hardware-in-the-loop Validation for a 10 MVA ETO-based STATCOM for Wind Farm Application
Yu Liu, Zhengping Xi, Zhigang Liang, Wenchao Song, Subhashish Bhattacharya, Alex Huang, James Langston, Mischa Steurer, Wayne Litzenberger, Loren Anderson, Ram Adapa and Ashok Sundaram
North Carolina State University, United States; Florida State University, United States; Bonneville Power Administration, United States; Electric Power Research Institute, United States

9:45AM SVM Direct Torque Control of a Permanent Magnet Wind Power Generator and a Grid Converter
Zhuang Xu, Pengyao Ge, Dianguo Xu and C.H. Zhang
Harbin Institute Of Technology, China

Session S5-4a: Hybrid Energy Storage Systems
LOWER LEVEL, CARMEL/MONTEREY
Chair: J. Boecker, Paderborn University, Germany

8:30AM A Novel Scheme for Optimally Combining Batteries and Ultracapacitors
Arvind Govindaraj, Srdjan Lukic and Ali Emadi
North Carolina State University, United States; Illinois Institute of Technology, United States

8:55AM Optimization of Autonomous Hybrid Energy Storage System for Photovoltaic Applications
Margaret Glavin, Ka Wai Paul Chan and Gerard Hurley
National University of Ireland Galway, Ireland

9:20AM A Two-stage DC-DC Converter for the Fuel Cell-Supercapacitor Hybrid System
Zhe Zhang, Ole C. Thomsen and Michael A. E. Andersen
Technical University of Denmark, Denmark

9:45AM Optimized Energy Storage System Design for a Fuel Cell Vehicle Using a Novel Phase Shift and Duty Cycle Control
Lei Wang, Zhan Wang and Hui Li
Florida State University, United States

Session S5-5a: Utility Converter Power Quality Issues
LOWER LEVEL, SAN MARTIN/SAN SIMEON
Chair: D. Divan, Georgia Tech, USA

8:30AM Optimal PWM Method based on Harmonics Injection and Equal Area Criteria
Jin Wang, Damoun Ahmadi and Renxiang Wang
Ohio State University, United States

8:55AM Combined Active and Reactive Power Control of Power Converter Building Block to Facilitate the Connection of Micro-grid to Electric Power System
Xiaoxiao Yu and Ashwin M. Khambadkone
National University of Singapore, Singapore

9:20AM High Performance Harmonic Isolation By Means of The Single-phase Series Active Filter Employing The Waveform Reconstruction Method
Osman S. Senturk and Ahmet M. Hava
Aalborg University, Denmark; Middle East Technical University, Turkey

9:45AM A Dynamic Voltage Restorer Equipped with a High-Frequency Isolated DC-DC Converter
Takushi Jimichi, Hideaki Fujita and Hirofumi Akagi
Tokyo Institute of Technology, Japan

Session S5-6a: Wide-Bandgap Semiconductors and Applications
LOWER LEVEL, SAN CARLOS/SAN JUAN
Chair: J. Shen, University of Florida, USA

8:30AM Parameter Extraction Procedure for High Power SiC JFET
Alexander Grekov, Zhiyang Chen, Enrico Santi, Jerry Hudgins, H. Alan Mantooth, David Sheridan, and Jeff Casaday
University of South Carolina, United States; University of Nebraska - Lincoln, United States; University of Arkansas, United States; SemiSouth Laboratories, Inc., United States

8:55AM High-Voltage Capacitance Measurement System for SiC Power MOSFETs
Parrish Ralston, Tam Duong, Nanying Yang, David Berning, Colleen Hood, Allen Heffner, and Kathleen Meehan
Virginia Tech, United States; National Institute of Standards and Technology, United States

9:20AM Characterization and Modeling of 1.2 kV, 20 A SiC MOSFETs
Zheng Chen, Dushan Boroyevich, Rolando Burgos and Fred Wang
Virginia Tech, United States

9:45AM Characterization, Modeling of 10-kV SiC JBS Diodes and Their Application in X-Ray Generators
Jun Wang, Yu Du, Subhashish Bhattacharya and Alex Huang
North Carolina State University, United States

Session S5-7a: Special Machines
SECOND LEVEL, FIR
Chair: M. Popescu, Motor Des. Ltd, UK

8:30AM Magnetically Levitated Slice Motors - An Overview
Philipp Karutz, Thomas Nussbaumer and Johann Walter Kolar
ETH Zurich, Switzerland; Levitronix GmbH, Switzerland

8:55AM A Wound-Field Three-Phase Flux-Switching Synchronous Motor with All Excitation Sources on the Stator
Ackim Zulu, Barrie Mecrow and Matthew Armstrong
Newcastle University, Great Britain

9:20AM Motor Integrated Permanent Magnet Gear with a Wide Torque-Speed Range
Peter Rasmussen, Thomas Jahns, Hamid Toliyat, Hans-Henrik Mortensen and Torben Matzen
Aalborg University, Denmark; University of Wisconsin - Madison, United States; Texas A and M University, United States

9:45AM Design and Analysis of Slotless Brushless DC Motor
Jung-Moo Seo, Joo-Han Kim and In-Soung Jung
Korea electronics technology institute, Korea (South)

Session S5-8a: Induction Motor Drive Control Issues
SECOND LEVEL, OAK
Chair: J.M. Pacas, University of Siegen, Germany

8:30AM Rotor Parameter Identification of Saturated Induction Machines
Mikaela Ranta, Marko Hinkkanen and Jorma Luomi
Helsinki University of Technology, Finland

8:55AM Accurate Inverter Error Compensation and Related Self-Commissioning Scheme in Sensorless Induction Motor Drives
Gianmario Pellegrino, Radu Bojoi, Paolo Guglielmi and Francesco Cupertino
Politecnico di Torino, Italy; Politecnico di Bari, Italy

9:20AM Novel Voltage Trajectory Control for Field Weakening Operation of Induction Motor Drives
Ping-Yi Lin and Yen-Shin Lai
National Taipei University of Technology, Taiwan

9:45AM A Novel Adaptive Algorithm for Rotor-Flux and Slip Estimation of Sensorless Field-Oriented Induction Machine Drives
Bo Guan and Longya Xu
The Ohio State University, United States

Tuesday, September 22, 2009
10:45AM-12:00PM

Session S5-1b: Three-Phase Rectifiers
SECOND LEVEL, CEDAR
Chair: N. Zargari, Rockwell Automation, Canada

10:45AM A Comparative Study on Control Algorithm for Active Front-end Rectifier of Large Motor Drives Under Unbalance Input
Yongsug Suh and Yuran Go
Chonbuk National University, Korea (South)

11:10AM A Hybrid 18-Pulse Rectification Scheme For Diode Front End Variable Frequency Drives
Mahesh Swamy, Tsuneo Kume and Nory Takada
Yaskawa Electric America, United States; Yaskawa Electric Corporation, Japan

11:35AM Three Phase Current-Fed Z-Source PWM Rectifier
Qin Lei, Shuitao Yang and Fang Z. Peng
Michigan State University, United States; Zhejiang University, China

Session S5-2b: Advances in dc-dc Converters
SECOND LEVEL, PINE
Chair: A. Bhat, University of Victoria, Canada

10:45AM Minimum PCB Footprint Point-of-Load DC-DC Converter Realized with Switched-Capacitor Architecture
Vincent W Ng, Michael D Seeman and Seth R Sanders
University of California, Berkeley, United States

11:10AM Algebraic Foundation of Self Adjusting Switched Capacitors Converters
Sam Ben-Yaakov and Alexander Kushnerov
Ben-Gurion University, Israel

11:35AM Optimization of Transistors for Very High Frequency dc-dc Converters
Anthony Sagneri, David Anderson and David Perreault
Massachusetts Institute of Technology, United States; National Semiconductor, United States

Session S5-3b: Wind Energy Systems
LOWER LEVEL, SAN JOSE/SANTA CLARA
Chair: R. De Doncker, RWTH, Germany

10:45AM Growing Neural Gas (GNG) Based Maximum Power Point Tracking for High Performance VOC-FOC based Wind Generator System with an Induction Machine
Maurizio Cirrincione, Marcello Pucci and Gianpaolo Vitale
Universite' Technologique de Belfort Montbeliard, France; ISSIA-CNR, Italy

11:10AM Ride-through Strategy for DFIG Wind Turbine Systems Using Dynamic Voltage Restorers
Ahmad Ibrahim, Thanh Hai Nguyen, Dong-Choon Lee and Su-Chang Kim
Yeungnam University, Korea (South); Korea Western Power Co., Ltd, Korea (South)

11:35AM A New Control Method of Energy Capacitor System in DC-Based Wind Farm
S.M. Muyeen, Rion Takahashi, Toshiaki Murata and Junji Tamura
Kitami Institute of Technology, Japan

Session S5-4b: Hybrid Energy Storage Systems
LOWER LEVEL, CARMEL/MONTEREY
Chair: J. Boecker, Paderborn University, Germany

10:45AM An Ultra-Capacitor Based Regenerating Energy Storage System for Urban Rail Transit
Aiguo Xu, Shaojun Xie, Yuan Yao, Xiaobao Liu, Huafeng Xiao, and Jingjing Feng
Nanjing University of Aero. and Astro., China

11:10AM A Supercapacitor Based Light Rail Vehicle: System Design and Operations Modes
Luis Mir, Ion Etxeberria-Otadui, Igor Perez de Arenaza, Izaskun Sarasola and Txomin Nieva
IKERLAN-IK4 Tecnological Research Centre, Spain; TRAINELEC, Spain

11:35AM Optimal Energy Management for a Hybrid Energy Storage System Combining Batteries and Double Layer Capacitors
Christoph Romaus, Joachim Boecker, Katrin Witting, Albert Seifried and Oleksiy Znamenshchykov
University of Paderborn, Germany

Session S5-5b: Power Converter Drive Techniques
LOWER LEVEL, SAN MARTIN/SAN SIMEON
Chair: P-T Cheng, National Tsing Hua University, Taiwan

10:45AM Self-Driven Schemes for 12V Self-Driven Voltage Regulator
Ke Jin, Ming Xu, Yi Sun and Fred C. Lee
Nanjing University of Aeronuatics and Astronauti, China; Virginia Tech, United States; Linear Technology Corporation, United States

11:10AM A New Discontinuous Current-Source Driver for High Frequency Power MOSFETs
Zhiliang Zhang, Jizhen Fu, Yan-Fei Liu and Paresh Sen
Nanjing University of Aero. and Astro., China; Queen's University, Canada

11:35AM A High Efficiency Current Source Driver with Negative Gate Voltage for Buck Voltage Regulators
Jizhen Fu, Zhiliang Zhang, Wilson Eberle, Yan-Fei Liu and Paresh Sen
Queen's University, Canada; University of British Columbia, Canada

Session S5-6b: EMI Suppression Techniques
LOWER LEVEL, SAN CARLOS/SAN JUAN
Chair: J. Shen, University of Florida, USA

10:45AM High Frequency Modeling Method of EMI filters
Jean Luc Kotny, Margueron Xavier and Nadir Idir
University of Sciences and Technology of Lille, France; Ecole Centrale de Lille, France

11:10AM Optimization of Switching Transient Waveform to Reduce EMI Noise in a Selective Frequency Band
Satoshi Ogasawara, Tomohiko Igarashi, Hirohito Funato and Mitsuo Hara
Hokkaido University, Japan; Utsunomiya University, Japan; Calsonic Kansei Corporation, Japan

11:35AM Optimal Damping of EMI Filter Input Impedance
Lei Xing, Frank Feng and Jian Sun
Rensselaer Polytechnic Institute, United States; United Technologies Corporation, United States

Session S5-7b: Special Machines

SECOND LEVEL, FIR

Chair: M. Popescu, Motor Des. Ltd, UK

10:45AM **A Design Consideration of a Novel Bearingless Disk Motor for Artificial Hearts**
Junichi Asama, Akira Chiba, Oiwa Takaaki, Tadashi Fukao and Azizur Rahman
Shizuoka University, Japan; Tokyo University of Science, Japan; Motor Solution Co., Ltd, Japan; Memorial University of Newfoundland, Canada

11:10AM **Implementation of Super High-speed Permanent Magnet Synchronous Machine Drive**
Myoungho Kim, Jung-Sik Yim, Seung-Ki Sul and Sung-Il Lim
Seoul National University, Korea (South); Samsun Techwin, Inc., Korea (South)

11:35AM **Comparison of All and Alternate Poles Wound Flux-Switching PM Machines Having Different Stator and Rotor Pole Numbers**
J.T. Chen and Z.Q. Zhu
University of Sheffield, United Kingdom

Session S5-8b: Machine Drive Sensor and Control Issues

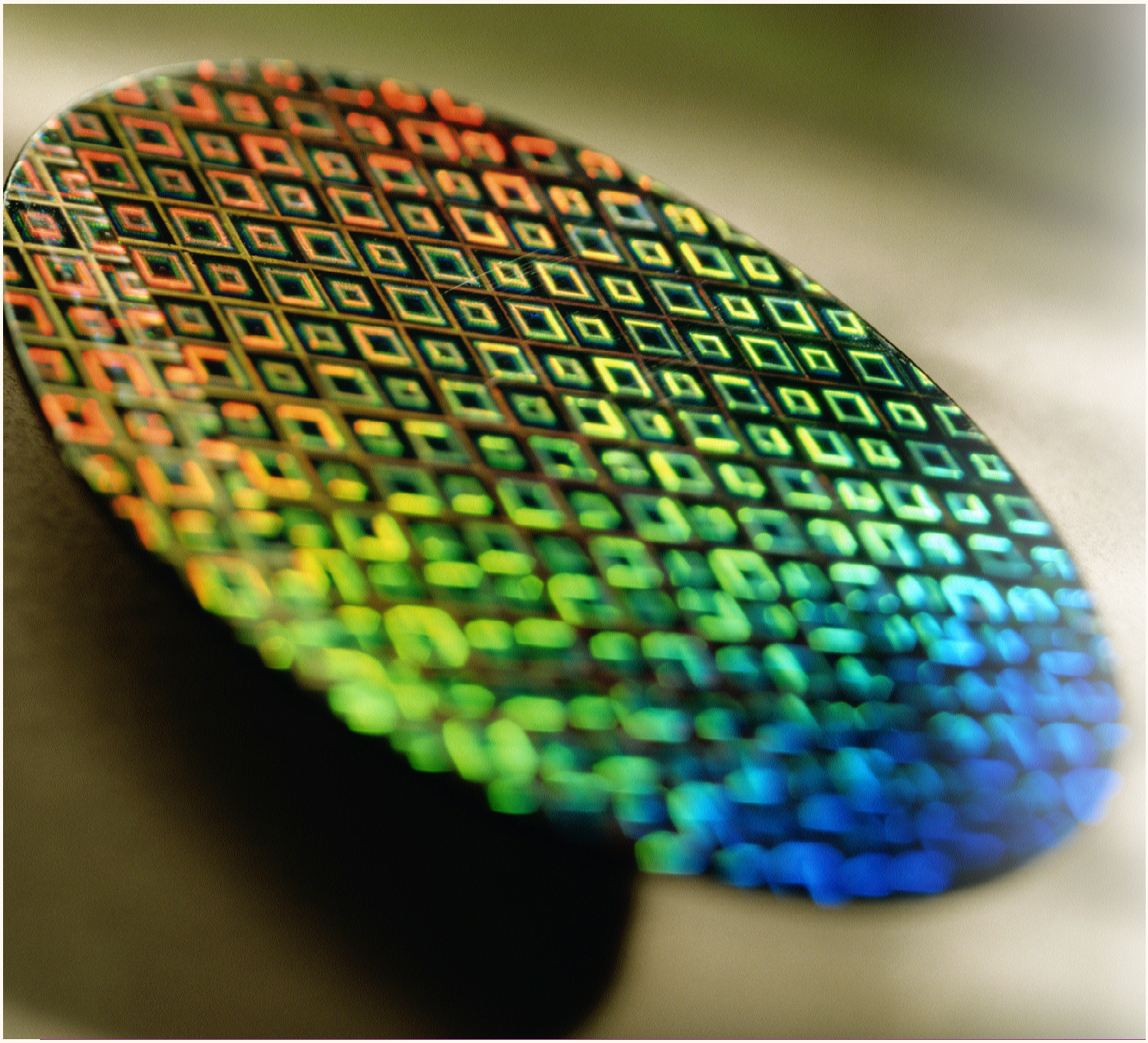
SECOND LEVEL, OAK

Chair: J-K Seok, Yeungnam U., S. Korea

10:45AM **Analysis and Compensation of Current Measurement Errors in a Doubly Fed Induction Generator**
Won-Sang Im, Seon-Hwan Hwang, Jang-Mok Kim and Jaeho Choi
Pusan National University, Korea (South); Chungbuk National University, Korea (South)

11:10AM **Compensation of Amplitude Imbalance and Imperfect Quadrature in Resolver Signals for PMSM Drives**
Seon-Hwan Hwang, Hyun-Jin Kim, Jang-Mok Kim, Hui Li and Liming Liu
Pusan National University, Korea (South); Florida State University, United States

11:35AM **Sensorless Control of a Novel Linear Magnetostrictive Motor**
Ali Sadighi and Won-jong Kim
Texas A and M University, United States



Wednesday, September 23, 2009
8:30AM-10:10AM

Session S6-1a: Inverter Power Quality and Control
SECOND LEVEL, CEDAR
Chair: J. Kolar, ETH Zurich, Switzerland

8:30AM A Transformerless Hybrid Active filter Based on a Neutral-Point-Clamped PWM Converter for a Medium-Voltage Motor Drive
Hirofumi Akagi and Ryota Kondo
Tokyo Institute of Technology, Japan

8:55AM Evaluation of VAR Control and Voltage Regulation Functionalities in a Single-Phase Utility-Connected Inverter for Distributed Energy Applications
Sudipta Chakraborty, Benjamin Kroposki and William Kramer
National Renewable Energy Laboratory, United States

9:20AM An Ultracapacitor-based Energy Storage System Design for High Power Motor Drive with Dynamic Real Power Compensation and Harmonic Cancellation
Liming Liu, Jang-Mok Kim and Hui Li
Florida State University, United States; Pusan National University, Korea (South)

9:45AM DC-link Voltage Stabilization for Reduced DC-link Capacitor Inverter
Wook-Jin Lee and Seung-Ki Sul
LG Electronics, Korea (South); Seoul National University, Korea (South)

Session S6-2a: High-Performance dc-dc Converters
SECOND LEVEL, PINE
Chair: S. Sanders, UC-Berkeley, USA

8:30AM High Power Density DC/DC Converter using the Close-Coupled Inductors
Mitsuaki Hirakawa, Masao Nagano, Watanabe Yasuto, Keigo Ando, Soumei Nakatomi and Hashino Satoshi
Honda R D Co.,Ltd., Japan

8:55AM Fully Bi-directional DC-DC Converter for EV Power Train with Power Density of 40 kW/l
Martin Pavlovsky, Yukinori Tsuruta and Atsuo Kawamura
Kanagawa Academy of Science and Technology, Japan; Yokohama National University, Japan

9:20AM Comparison of DC-DC Converter Topologies for Future SLHC Experiments
Simone Buso, Giorgio Spiazzi, Federico Faccio and Stefano Michelis
University of Padova, Italy; CERN, Switzerland

9:45AM Bi-directional Buck/Boost Dc-Dc Converter with Ultra High Efficiency Based on Improved SAZZ Topology
Martin Pavlovsky, Yukinori Tsuruta and Atsuo Kawamura
Kanagawa Academy of Science and Technology, Japan; Yokohama National University, Japan

Session S6-3a: Energy Storage Technology
LOWER LEVEL, SAN JOSE/SANTA CLARA
Chair: U. Deshpande, USA

8:30AM Ageing Assessment of Supercapacitors During Calendar Life and Power Cycling Tests
El Hassane El Brouji, Jean-Michel Vinassa, Olivier Briat, Nicolas Bertrand, Jean-Yves Deletage and Eric Woirgard
Universite de Bordeaux, France

8:55AM Discrimination of Battery Characteristics Using Discharging/Charging Voltage Pattern Recognition
Kim Jonghoon, Lee Seongjun and Cho Bohyung
Seoul National University, Korea (South)

9:20AM A Novel Equalization Method with Defective-Battery-Replacing for Series-Connected Lithium Battery Strings
Weijing Du, Xiucheng Huang, Shuitao Yang, Fan Zhang, Xinke Wu and Zhaoming Qian
Zhejiang University, China

9:45AM Individual Cell Voltage Equalizer Using Selective Two Current Paths for Series Connected Li-ion Battery Strings
Chol-Ho Kim, Hong-Sun Park, Gun-Woo Moon and Young-Do Kim
KAIST, Korea (South); Samsung Electro-Mechanics, Korea (South)

Session S6-4a: Transportation and Industrial Applications
LOWER LEVEL, CARMEL/MONTEREY
Chair: M. Islam, Delphi Steering Systems, USA

8:30AM Load Position Detection and Validation on the Variable-Phase Contactless Energy Transfer Desktop
Christoph Sonntag, Jorge Duarte and Guus Pemen
Eindhoven University of Technology, Netherlands

8:55AM Variable Tuning in LCL Compensated Contactless Power Transfer Pickups
Nicholas Keeling, Grant Covic, Hao Frank, Libin George and John Boys
University of Auckland, New Zealand

9:20AM New Generation of Full Low-Floor Trams: Control of Wheel Drives with Permanent Magnet Synchronous Motors
Zdenek Peroutka, Karel Zeman, Frantisek Krus and Frantisek Kosta
University of West Bohemia in Pilsen, Czech Republic; Skoda Electric, a.s., Czech Republic

9:45AM Nine-phase Synchronous Motor Drive System for High-speed Elevator
Eunsoo Jung, Hyunjae Yoo, Seung-Ki Sul, Hong-Soon Choi and Yun-Young Choi
Seoul National University, Korea (South); Kyungpook National University, Korea (South); Hyundai Elevator, Korea (South)

Session S6-5a: DC-DC Converters
LOWER LEVEL, SAN MARTIN/SAN SIMEON
Chair: B. Lehman, Northeastern University, USA

8:30AM Multiple-input Single Ended Primary Inductor Converter (SEPIC) Converter for Distributed Generation Applications
Ruichen Zhao and Alexis Kwasinski
The University of Texas at Austin, United States

8:55AM Soft-Switching Dual Forward DC/DC Converters Employing Secondary Side Control
Bin Su, Tao Yang, Zhengyu Lu and Dehong Xu
Zhejiang University, China

9:20AM Interleaved Coupled-inductor Boost Converter with Boost Type Snubber for PV Power System
S.-Y. Tseng, C.-L. Ou, S.-T. Peng and J.-D. Lee
Chang-Gung University, Taiwan

9:45AM A Class of Single-Step High-Voltage DC-DC Converters with Low Voltage Stress and High Output Current Capacity
Huai Wang, Henry S.H. Chung, Saad Tapuchi and Adrian Ioinovici
City University of Hong Kong, Hong Kong; Sami Shamoon College of Engineering, Israel; Holon Institute of Technology, Israel

Session S6-6a: Converter Magnetic Components
LOWER LEVEL, SAN CARLOS/SAN JUAN
Chair: C. Sullivan, Dartmouth College, USA

8:30AM Designing of Coupled Inductor in Interleaved Critical Conduction Mode Boost PFC Converter
Fei Yang, Xinbo Ruan, Ming Xu and Qing Ji
Nanjing Univ. of Aeronautics and Astronautics, China; FSP-POWERLAND Technology Inc., China

8:55AM Analytical Modeling of Losses for High Frequency Planar LCT Components
Kien Lai-Dac, Yves Lembeye, Abdelhadi Besri and Jean-Pierre Keradec
Grenoble Electrical Engineering lab, France; Joseph Fourier University, France

9:20AM Planar Inductors for High-frequency DC/DC Converters Using Microwave Magnetic Material
Christian Martin, Jean-Jacques Rousseau, Desire Allaissem, Ludovic Menager, Vincent Bley, Bruno Allard, Dominique Tournier, Maher Soueidan and Yves Lembeye
Lyon1 university, AMPERE Lab, France; DIOM Lab, France; Toulouse university, LAPLACE Lab, France; INSA de Lyon, AMPERE Lab, France; Joseph Fourier University, France

9:45AM Fabrication and Modeling of a Planar Magnetic Structure with Directly Etched Windings
Anish Prasai and Willem Odendaal
Georgia Institute of Technology, United States; Virginia Tech, United States

Session S6-7a: Machine Losses and Torque Ripple
SECOND LEVEL, FIR
Chair: A. EL-Refaie, GE-GRC, USA

8:30AM Modeling of Stator Teeth-Tip Flux Densities and Iron Losses in Fractional Slot Concentrated Winding (FSCW) Surface PM Machines
Patel Reddy and Thomas Jahns
University of Wisconsin - Madison, United States

8:55AM Core Loss and Torque Ripple in IPM Machines: Dedicated Modeling and Design Trade Off
Gianmario Pellegrino, Paolo Guglielmi, Alfredo Vagati and Franco Villata
Politecnico di Torino, Italy

9:20AM Transposition Effects on Bundle Proximity Losses in High-Speed PM Machines
Patel Reddy, Thomas Jahns and Theodore Bohn
University of Wisconsin - Madison, United States; Argonne National Laboratory, United States

9:45AM Impact of Flux Weakening Current to the Iron Loss in an IPMSM Including PWM Carrier Effect
Kan Akatsu, Katsuyuki Narita, Hiroyuki Sakashita and Takashi Yamada
Shibaura Institute of Technology, Japan; JSOL Corporation, Japan

Session S6-8a: Sensorless Control of PM Machine Drives
SECOND LEVEL, OAK
Chair: F. Briz, University of Oviedo, Spain

8:30AM Performance Improvement of Sensorless IPMSM Drives in Low-speed Region Using Online Parameter Identification
Yukinori Inoue, Yasunori Kawaguchi, Shigeo Morimoto and Masayuki Sanada
Osaka Prefecture University, Japan

8:55AM A New Flux-Barrier Design of Torque Ripple Reduction in Saliency-Based Sensorless Drive IPM Motors for General Industrial Applications
Yoshiaki Kano, Takafumi Terahai, Takashi Kosaka, Nobuyuki Matsui and Toshihito Nakanishi
Toyota National College of Technology, Japan; Nagoya Institute of Technology, Japan; Toyo Denki Seizo K.K., Japan

9:20AM An On-line Position Error Compensation Method for Sensorless IPM Motor Drives Using High Frequency Injection
Jingbo Liu, Thomas Nondahl, Peter Schmidt, Semyon Royak and Mark Harbaugh
Rockwell Automation, United States

9:45AM Sensorless Position Control of Permanent Magnet Motors with Pulsating Current Injection Considering End-effect
Francesco Cupertino, Paolo Giangrande, Gianmario Pellegrino and Luigi Salvatore
Politecnico di Bari, Italy; Politecnico di Torino, Italy

Wednesday, September 23, 2009 10:45AM-12:00PM

Session S6-1b: Multi-Level Inverters
SECOND LEVEL, CEDAR
Chair: P. Wheeler, University of Nottingham, UK

10:45AM A Single Phase Multilevel Inverter Using Switched Series/Parallel DC Voltage Sources
Youhei Hinago and Hirotaka Koizumi
Tokyo University of Science, Japan

11:10AM New Topologies of Multi-Level Power Converters for Use of Next-Generation Ultra High-Speed Switching Devices
Toshihiko Noguchi and Suroso Suroso
Shizuoka University, Japan; Nagaoka University of Technology, Japan

11:35AM An Optimum PWM Strategy for 5-Level Active NPC (ANPC) Converter Based on Real-time Solution for THD Minimization
Jun Li, Yu Liu, Subhashish Bhattacharya and Alex Huang
North Carolina State University, United States

Session S6-2b: Soft-Switched dc-dc Converters
SECOND LEVEL, PINE
Chair: T-S Liang, National Cheng Kung University, Taiwan

10:45AM A Novel ZVS Non-Isolated Current Tripler Topology for Low Voltage and High Current Applications
Zhiliang Zhang, Eric Meyer, Yan-Fei Liu and Paresh Sen
Nanjing University of Aero. and Astro., China; Queen's University, Canada

11:10AM A ZCS Full-Bridge Converter without Voltage Over-Stress on the Switches
Xin Zhang, Henry S.H. Chung, Xinbo Ruan and Adrian Ioinovici
Nanjing University of Aeronautics and Astronauti, China; City University of Hong Kong, Hong Kong; Nanjing Univ. of Aeronautics and Astronautics, China; Holon Institute of Technology, Israel

11:35AM Soft-Switched CCM Boost Converter with High Voltage Gain for High Power Applications
Sewan Choi and Sungsik Park
Seoul National University of Technology, Korea (South)

Session S6-3b: Distributed Energy Resources and Systems
LOWER LEVEL, SAN JOSE/SANTA CLARA
Chair: U. Deshpande, USA

10:45AM Grid Synchronization Techniques for Converter Interfaced Distributed Generation Systems
Davood Yazdani, Majid Pahlevaninezhad and Alireza Bakhshai
Queen's University, Canada

11:10AM Control of Tie-line Power Flow of Microgrid Including Wind Generation by DSTATCOM-SMES Controller
Marcelo Gustavo Molina and Pedro Enrique Mercado
CONICET - National University of San Juan, Argentina

11:35AM Control Strategies for Distributed Energy Resource Interface Converters in the Low Voltage Microgrid
Chia-Tse Lee, Cheng-Chieh Chuang, Chia-Chi Chu and Po-Tai Cheng
National Tsing Hua University, Taiwan; Delta Electronics, Inc., Taiwan

Session S6-4b: Transportation and Industrial Applications
LOWER LEVEL, CARMEL/MONTEREY
Chair: M. Islam, Delphi Steering Systems, USA

10:45AM A Novel ZVS-PWM DC-DC Converter for Bidirectional Applications with Steep Conversion Ratio
Pritam Das, Ahmad Mousavi and Gerry Moschopoulos
University of Western Ontario, Canada

11:10AM Analysis and Design of a ZCS-PWM Full-Bridge Fuel Cell Converter
Ahmad Mousavi, Pritam Das and Gerry Moschopoulos
University of Western Ontario, Canada

11:35AM A Power Conversion System for AC Furnace with Enhanced Arc Stability
Yongsug Suh, Yongjoong Lee, Hyeoncheol Park and Peter Steimer
Chonbuk National University, Korea (South); Paul Scherrer Institute, Switzerland; ABB Ltd, Switzerland

Session S6-5b: Lighting Analysis and Power Electronics Control
LOWER LEVEL, SAN MARTIN/SAN SIMEON
Chair: B. Lehman, Northeastern University, USA

10:45AM A Simple Physical Low Pressure Discharge Lamp Model
Deyan Lin, Wei Yan, Georges Zissis and Shu Yuen (Ron) Hui
City University of Hong Kong, Hong Kong; University Toulouse III, France

11:10AM On The Driving Techniques for High-Brightness LEDs
Ka Hong Loo, Wai-Keung Lun, Siew-Chong Tan, Yuk Ming Lai and Chi Kong Tse
Hong Kong Polytechnic University, Hong Kong

11:35AM Non Iterative Design Procedure of LCC-based Electronic Ballasts for Fluorescent Lamps Including Dimming Operation
Simone Buso and Giorgio Spiazzi
University of Padova, Italy

Session S6-6b: Converter Magnetic Components
LOWER LEVEL, SAN CARLOS/SAN JUAN
Chair: C. Sullivan, Dartmouth College, USA

10:45AM Optimization of Shielded PCB Air-Core Toroids for High Efficiency DC-DC Converters
Stefano Orlandi, Bruno Allongue, Georges Blanchot, Simone Buso, Federico Faccio, Cristian Fuentes, Maher Kayal, Stefano Michelis and Giorgio Spiazzi
CERN, Switzerland; University of Padova, Italy; EPFL, Switzerland

11:10AM Design and Optimisation of Magnetic Structures for Lumped Inductive Power Transfer Systems
Mickel Budhia, Grant Covic and John Boys
University of Auckland, New Zealand

11:35AM A New Separated Resonant-Inductor Winding Phase Shift Full Bridge Converter for Server Power System
Kyu-Min Cho, Young-Do Kim, In-Ho Cho, Bong-Chul Kim and Gun-Woo Moon
KAIST, Korea (South)

Session S6-7b: Actuator Analysis and Control

SECOND LEVEL, FIR

Chair: A. Knight, University of Alberta, Canada

10:45AM Implementation and Control of a Electromagnetic Actuator for Miniature Magnetically Levitated Rotating Machines
Sheng-Ming Yang and Chien-Lung Huang
National Taipei University of Technology, Taiwan

11:10AM Analytical Determination of Optimal Split Ratio of E-core Permanent Magnet Linear Oscillatory Actuators
X. Chen and Z.Q. Zhu
University of Sheffield, United Kingdom

11:35AM Robust Control of Low-Cost Actuator for Automotive Active Front Steering Application
Chandra Namuduri, Suresh Gopalakrishnan, Balarama Murty, Robb Bolio and Ross Feller
General Motors, United States

Session S6-8b: Sensorless Control of Drives

SECOND LEVEL, OAK

Chair: F. Briz, University of Oviedo, Spain

10:45AM Optimization of Transient Operations in Sensorless Control Techniques Based on Carrier Signal Injection
Alfio Consoli, Alberto Gaeta, Giuseppe Scarcella, Giacomo Scelba and Antonio Testa
University of Catania, Italy; University of Messina, Italy

11:10AM High Bandwidth Sensorless Algorithm for AC Machines Based on Square-wave Type Voltage Injection
Young-Doo Yoon, Seung-Ki Sul, Shinya Morimoto and Kozo Ide
Seoul National University, Korea (South); Yaskawa Electric Corporation, Japan;

11:35AM Active-Flux Based Motion Sensorless Vector Control of Biaxial Excitation Generator/Motor for Automobiles (BEGA)
Vasile Coroban-Schramel, Ion Boldea, Gheorghe-Daniel Andrescu and Frede Blaabjerg
University Politehnica of Timisoara, Romania; Aalborg University, Denmark

Wednesday, September 23, 2009 1:30PM-3:10PM

Session S7-1: Multilevel Inverters

SECOND LEVEL, CEDAR

Chair: J. Wang, Ohio State University, USA

1:30PM A Novel High Efficient Fifteen Level Power Converter
Youssef Ounejjar and Kamal Al-Haddad
Ecole de Technologie Superieure, Canada

1:55PM Simple and Robust Feedback Control of a Two-Switch Multi-Level Half-Bridge Inverter with Non-Ideal Operation
Chris Chapelsky, John Salmon and Andrew M. Knight
University of Alberta, Canada

2:20PM A DC-Voltage-Balancing Circuit Including a Single Coupled Inductor for a Five-Level Diode-Clamped PWM Inverter
Kazunori Hasegawa and Hirofumi Akagi
Tokyo Institute of Technology, Japan

2:45PM Three-Phase Multilevel Bidirectional DC-AC Converter Using Three-Phase Coupled Inductor
Ivo Barbi and Romeu Hausmann
Federal University of Santa Catarina, Brazil; University of Blumenau - FURB, Brazil

Session S7-2: Advances in dc-dc Converters

SECOND LEVEL, PINE

Chair: D. Maksimovic, University of Colorado, Boulder, USA

1:30PM Converter and Control Design for Very Low-Frequency High-Voltage Test Systems
Zhiyu Cao, Norbert Froehleke and Joachim Boecker
University of Paderborn, Germany

1:55PM Performance Analysis of a Multi-Mode Interleaved Boost Converter
Biswajit Ray, Hiroyuki Kosai, Seana McNeal, Brett Jordan and James Scofield
Bloomsburg University of Pennsylvania, United States; UES Inc., United States; Air Force Research Laboratory, WPAFB, United States

2:20PM Output Ripple Reduction of an Automotive Multi-Phase Bi-Directional DC-DC Converter
Stefan Waffler, Juergen Biela and Johann Walter Kolar
ETH Zurich, Switzerland

2:45PM A Novel Current-Fed Dual-Inductor Boost Converter with Ripple Reduction (DIBCRR) for High Output-Voltage Applications
Ching-Shan Leu and Ming-Hui Li
National Taiwan Univ. of Science and Technology, Taiwan

Session S7-3: Converters for Renewable Energy Systems

LOWER LEVEL, SAN JOSE/SANTA CLARA

Chair: S. Schroeder, GE-GRC, Germany

1:30PM Design and Control of Proportional-Resonant Controller based Photovoltaic Power Condition System
Han-Ju Cha, Trung-Kien Vu and Jae-Eon Kim
Chungnam National University, Korea (South); Chungbuk National University, Korea (South)

1:55PM A Nonlinear approach to Control Instantaneous Power for Single-Phase Grid-Connected Photovoltaic Systems
Sayed Ali Khajehoddin, Masoud Karimi-Ghartemani, Alireza Bakhshai and Praveen K. Jain
Queen's University, Canada; Sharif University of Technology, Iran

2:20PM Hardware Based Performance Analysis of a Multi-function Single-Phase PV-AF System
Hyo-Ryong Seo, Seong-Jae Jang, Gyeong-Hun Kim, Minwon Park and In-Keun Yu
Changwon National University, Korea (South)

2:45PM A Novel Zero-Voltage-Switching Scheme for Renewable/Alternative Energy Based High-Frequency-AC-Link Inverter
Sudip K. Mazumder
University of Illinois Chicago, United States

Session S7-4: Power Systems and Utility Applications

LOWER LEVEL, CARMEL/MONTEREY

Chair: P. Steimer, ABB, Switzerland

1:30PM Power Flow Control in Networks Using Controllable NetworkTransformers
Debrup Das and Deepak Divan
Georgia Institute of Technology, United States

1:55PM Experimental Implementation of a Multilevel Converter for Power System Integration
Alan Watson, Si Dang, Patrick Wheeler, Jon Clare and Gopal Mondal
University of Nottingham, United Kingdom

2:20PM Multiple Second Order Generalized Integrators for Harmonic Synchronization of Power Converters
Pedro Rodriguez, Alvaro Luna, Ion Etxeberria-Otadui, Juan Ramon Hermoso and Remus Teodorescu
Technical University of Catalonia, Spain; IKERLAN-IK4 Tecnological Research Centre, Spain; Aalborg University, Denmark

2:45PM Adaptive Echo State Network to Maximize Overhead Power Line Dynamic Thermal Rating
Yi Yang, Ronald Harley, Deepak Divan and Thomas Habetler
Georgia Institute of Technology, United States

Session S7-5: Reliability and Diagnostics

LOWER LEVEL, SAN MARTIN/SAN SIMEON

Chair: L. Tolbert, University of Tennessee, USA

1:30PM Gear Fault Diagnostics Integrated in the Motion Servo Drive for Electromechanical Actuators
Kum-Kang Huh, Robert Lorenz and Nicholas J. Nagel
GE Global Research Center, United States; University of Wisconsin - Madison, United States; Woodward MPC, Skokie, IL, United States

1:55PM Modulated Error Voltages for the Diagnosis of Faults in Matrix Converters
Sergio Cruz, Marco Ferreira, Andre Mendes and Antonio Cardoso
University of Coimbra / IT, Portugal; University of Coimbra, Portugal

2:20PM Reliability Assessment of Fault Tolerant DC-DC converters for Photovoltaic Applications
Sairaj Dhople, Ali Davoudi, Alejandro Dominguez-Garcia and Patrick Chapman
University of Illinois at Urbana-Champaign, United States

2:45PM Automated Detection of Rotor Faults for Inverter-fed Induction Machines under Standstill Conditions
Byunghwan Kim, Kwanghwan Lee, Jinkyu Yang, Sang Bin Lee, Ernesto Wiedenbrug and Manoj Shah
Korea University, Korea (South); Baker Instrument Company - an SKF Group Company, United States; GE Global Research Center, United States

Session S7-6: Wide-Bandgap Semiconductors and Applications

LOWER LEVEL, SAN CARLOS/SAN JUAN

Chair: J-L Schanen, Grenoble INP, France

1:30PM Design Considerations of a Fast 0-Ohm Gate-Drive Circuit for 1.2 kV SiC JFET Devices in Phase-Leg Configuration
Rolando Burgos, Zheng Chen, Dushan Boroyevich and Fred Wang
ABB Inc. - USCRC, United States; Virginia Tech, United States

1:55PM A Shoot-Through Protection Scheme for Converters Built with SiC JFETs
Rixin Lai, David Lugo, Fred Wang, Rolando Burgos and Dushan Boroyevich
Virginia Tech, United States

2:20PM Optically-Activated Gate Control (OAGC) for the Next-Generation SiC-based Power Electronics Devices and Applications
Sudip K. Mazumder and Tirthajyoti Sarkar
University of Illinois Chicago, United States

2:45PM Vertical SiC JFET Model with Unified Description of Linear and Saturation Operating Regions
Zhiyang Chen, Alexander Grekov, Ruiyun Fu, Enrico Santi, Jerry Hudgins, Alan Mantooth, David Sheridan and Jeff Casaday
University of South Carolina, United States; University of Nebraska - Lincoln, United States; University of Arkansas, United States; Semi South Laboratories, Inc., United States.

Session S7-7: Machine Condition Monitoring

SECOND LEVEL, FIR

Chair: D. Dorrell, UTS, Australia

1:30PM A Transfer Function-based Thermal Model Reduction Study for Induction Machine Thermal Overload Protective Relays
Pinjia Zhang, Yi Du and Thomas Habetler
Georgia Institute of Technology, United States

1:55PM A Novel Cooling Condition Monitoring Method for Induction Motors Based on Particle Swarm Optimization
Yi Du, Pinjia Zhang, Zhi Gao and Thomas Habetler
Georgia Institute of Technology, United States; Schneider Electric, United States

2:20PM Automated Monitoring of Magnet Quality for Permanent Magnet Synchronous Motors at Standstill
Jongman Hong, Doosoo Hyun, Sang Bin Lee, Ji Yoon Yoo and Kwangwoon Lee
Korea University, Korea (South); Mokpo National Maritime University, Korea (South)

2:45PM Towards Practical Quantification of Induction Drives Mixed Eccentricity
Carlo Concari, Giovanni Franceschini and Carla Tassoni
University of Parma, Italy

Session S7-8: PM Machine Control and Suspension

SECOND LEVEL, OAK

Chair: S. Royak, Rockwell Automation, USA

1:30PM Automatic Tracking of MTPA Trajectory in IPM Motor Drives Based on AC Current Injection
Silverio Bolognani, Roberto Petrella, Antonio Prearo and Luca Sgarbossa
University of Padova, Italy; University of Udine, Italy

1:55PM Extended Field Weakening and Overloading of High-torque Density Permanent Magnet Motors
Deak Csaba, Binder Andreas, Funieru Bogdan and Mirzaei Mehran
TU Darmstadt, Germany

2:20PM Magnetic Guidance of the Mover in a Long-primary Linear Motor
C. Phong Khong, Roberto Leidhold and Peter Mutschler
Technische Universitaet Darmstadt, Germany

2:45PM Experimental Evaluation of Magnetic Suspension Characteristics in a 5-axis Active Control Type Bearingless Motor without a Thrust Disk for Wide-gap Condition
Masatsugu Takemoto, Satoru Iwasaki, Hajime Miyazaki, Akira Chiba and Tadashi Fukao
Hokkaido University, Japan; Tokyo City University, Japan; Tokyo University of Science, Japan

Wednesday, September 23, 2009
3:15PM-5:00PM
Lower Level, Bayshore Foyer, Exhibit Hall

POSTER SESSION P8-1: DC-DC CONVERTERS AND LIGHTING
Chair: G-J Su, Oak Ridge National Laboratory, USA

P2501 Implementation of Bi-level Current Driving Technique for Improved Efficacy of High-Power LEDs
Wai-Keung Lun, Ka Hong Loo, Siew-Chong Tan, Yuk Ming Lai and Chi Kong Tse
Hong Kong Polytechnic University, Hong Kong

P2502 Dynamic Control of LED Systems Based on the General Phot-Electro-Thermal Theory
Yaxiao Qin, Deyan Lin, Henry S.H. Chung, Wei Yan and Shu Yuen (Ron) Hui
City University of Hong Kong, Hong Kong

P2503 Ballast for Independent Control of Multiple LED Lamps
Xiaohui Qu, Siu-Chung Wong and Chi Kong Tse
Hong Kong Polytechnic University, Hong Kong

P2504 Self-Oscillating Flyback Driver for Power LEDs
Edilson Mineiro, Reuber Santiago, Fernando Antunes, Arnaldo Perin and Cicero Postiglione
IFET, Brazil; Federal University of Ceara, Brazil; Federal University of Santa Catarina, Brazil

P2505 Analysis of the Structural Designs of LED Devices and Systems Based on the General Photo-Electro-Thermal Theory
Shu Yuen (Ron) Hui and Yaxiao Qin
City University of Hong Kong, Hong Kong

P2506 FPGA-Based Digital Current Mode Controller for Phase-Shifted Full-Bridge PWM Converter
Jeong-Gyu Lim, Se-Kyo Chung and Yujin Song
Gyeongsang National University, Korea (South); Korea Institute of Energy Research, Korea (South)

P2507 New Method to Cancel High Frequency Current Undulations Generated by DC/DC Converter
Ahmed Shahin, Roghayeh Gavagsaz-Ghoachani, Jean-Philippe Martin, Serge Pierfederici, Farid Meibody-Tabar and B. Davat
GREEN - INPL - Nancy Universite, France

P2508 Bus-Voltage Ripple Optimization Method for Automotive Multiphase DC/DC-Converters
Tomas Reiter, Dieter Polenov, Hartmut Proebstle and Hans-Georg Herzog
Technical University Munich, Germany; BMW Group, Germany

P2509 Controller Design Issues and Solutions for Buck Converters with Phase Shedding and AVP Functions
Liyu Yang, Jiwei Fan and Alex Huang
North Carolina State University, United States

P2510 High Efficiency and Smooth Transition Buck-Boost Converter for Extending Battery Life in Portable Devices
Ping-Ching Huang, Wei-Quan Wu, Hsin-Hsin Ho and Ke-Horng Chen
Department of Electrical and Control Engineering, Taiwan

P2511 Current Boosted Active Clamp Forward Converter without Output Filter
Keun-Wook Lee, Seong-Wook Choi, Byoung-Hee Lee and Gun-Woo Moon
KAIST, Korea (South)

P2512 Multiple-Input Full Bridge DC/DC Converter
Dongsheng Yang, Xinbo Ruan, Yan Li and Fuxin Liu
Nanjing Univ. of Aeronautics and Astronautics, China; HUST, China; NUAA, China

P2513 A Unified Derivation of Second-Order Switching Surface for Boundary Control of DC-DC Converters
Huai Wang, Henry S.H. Chung and Jerome Presse
City University of Hong Kong, Hong Kong

P2514 High-Efficiency Slope Compensator (HSC) with Input-Independent Load Condition Identification in Current Mode DC/DC Buck Converters
Wei-Jen Lai, Chi-Lin Chen, Yu-Chiao Hsieh and Ke-Horng Chen
National Chiao Tung University, Taiwan

P2515 A Hold-up Time Compensation Circuit for PWM Front-end DC/DC Converters
Kang-Hyun Yi, In-Ho Cho, Bong-Chul Kim and Gun-Woo Moon
KAIST, Korea (South)

P2516 A Dual Active Bridge Buck-Boost (DAB3) DC-DC Converter for High Power Applications
Sangtaek Han and Deepak Divan
Georgia Institute of Technology, United States

POSTER SESSION P8-2: MODELING AND CONTROL OF POWER ELECTRONICS
Chair: J-J Liu, Xi'an University, China

P2701 Interleaved Discontinuous Space-Vector PWM for A Multi-Level PWM VSI using a 3-phase Split-Wound Coupled Inductor
Behzad Vafakhah, John Salmon and Andrew M. Knight
University of Alberta, Canada

P2702 Analysis and Control of DC-DC Converters Based on Lyapunov Stability Theory
Fellipe Garcia, Jose Antenor Pomilio, Grace Deaecto and Jose Claudio Geromel
University of Campinas, Brazil

P2703 Peak-Current-Mode-Controlled Buck Converter with Positive Feedforward Control
Hyoung Y. Cho and Enrico Santi
University of South Carolina, United States

P2704 Boundary Control of DC-AC Inverters Using Ripple-Derived Switching Surface
Sufen Chen, Yuk Ming Lai, Siew-Chong Tan and Chi Kong Tse
Hong Kong Polytechnic University, Hong Kong

P2705 High Performance Controller for Voltage-controlled Current Source Inverter with Nonlinear Loads
Longcheng Tan, Yaohua Li, Congwei Liu, Ping Wang, Xiaomei Lv and Zixin Li
Institute of Electrical Engineering, CAS, China

P2706 Constant-Frequency Hysteresis Current Control of Grid-Connected VSI without Bandwidth Control
Carl N.M. Ho, Victor S.P. Cheung and Henry S.H. Chung
ABB Switzerland Ltd, Switzerland; City University of Hong Kong, Hong Kong

P2707 Auto-normalizing Phase-Locked Loop for Grid-connected Converters
Lennart Angquist and Massimo Bongiorno
Royal Institute of Technology, Sweden; Chalmers University of Technology, Sweden

P2708 Comparison among Digital Current Controllers applied to Power Factor Correction Boost Converters
Leandro Roggia, Jose Eduardo Baggio and Jose Renes Pinheiro
Federal University of Santa Maria, Brazil; Centro Universitario Franciscano, Brazil

P2709 Small-Signal Model and Control Design of LCC Resonant Converter with a Capacitive Load Applied in Very Low Frequency High Voltage Test System
Manli Hu, Norbert Froehleke and Joachim Boecker
University of Paderborn, Germany

P2710 Small Signal Model for Boost Phase-shifted Full Bridge Converter in High Voltage Application
Xin Zhang, Xinbo Ruan and Wu Chen
Nanijing University of Aeronautics Astronautics, China

P2711 Generalized DC Voltage Regulation Strategy for n:1 Relation Cascade H-Bridge Converter-Based STATCOM
Javier Perez-Ramirez, Victor Cardenas, Homero Miranda and Gerardo Espinosa-Perez
Universidad Autonoma de San Luis Potosi, Mexico; Universidad Nacional Autonoma de Mexico, Mexico

P2712 Active Stabilization of a Poorly Damped Input Filter Supplying a Constant Power Load
Ahmed-Bilal Awan, Serge Pierfederici, Babak Nahid-Mobarakeh and Farid Meibody-Tabar
GREEN ENSEM INPL, France

P2713 Investigation of Active Damping Approaches for PI-based Current Control of Grid-Connected PWM Converters with LCL Filters
Joerg Dannehl, Friedrich W. Fuchs, Paul B. Thogersen and Steffan Hansen
Christian-Albrechts-University of Kiel, Germany; KK-Electronic A/S, Denmark; Danfoss Drives A/S, Denmark

P2714 Autonomous Power Electronic Interfaces Between Microgrids
Sandeep Bala and Giri Venkataramanan
ABB Corporate Research, United States; University of Wisconsin - Madison, United States

P2715 Fast Frequency Response Measurement of Switched-Mode Converter in the Presence of Nonlinear Distortions
Tomi Roinila, Matti Vilkko and Teuvo Suntio
Tampere University of Technology, Finland

P2716 Modified Projected Cross Point Control - A Large Signal Analysis
Mostafa Khazraei and Mehdi Ferdowsi
Missouri University of Science and Technology, United States

P2717 Analysis of the Beat Frequency Oscillations in Voltage Regulators
Kisun Lee and Han Zou
ON Semiconductor, United States

P2718 On EMI-filter Interactions in a Regulated Converter - Stability and Load-transient Performance
Teuvo Suntio, Jari Leppaaho and Mikko Hankaniemi
Tampere University of Technology, Finland; Celerium Technologies Inc, Finland

POSTER SESSION P8-3: AC-AC CONVERSION AND HIGH-POWER TECHNIQUES

Chair: P. Tenca, ABB, Sweden

P2901 Ac-Ac Dual Active Bridge Converter for Solid State Transformer
Hengsi Qin and Jonathan Kimball
Missouri University of Science and Technology, United States

P2902 Push-pull mode Three-level AC/AC Converter
Kaiming Yang and Lei Li
Nanjing University of Science and Technology, China

P2903 Novel Control Strategy for Synchronous PWM on a Matrix Converter
Jun-ichi Itoh and Koji Maki
Nagaoka University of Technology, Japan

P2904 Predictive Control with Active Damping in a Direct Matrix Converter
Marco E. Rivera, Pablo I. Correa, Jose R. Rodiguez, Jose R. Espinoza, Christian Rojas and Ignacio Lizama
UTFSM, Chile; Universidad de Concepcion, Chile

P2905 Novel Three-Phase AC-AC Z-Source Converters Using Matrix Converter Theory
Shao Zhang, King Jet Tseng and Trong Duy Nguyen
Nanyang Technological University, Singapore

P2906 High Power Factor Control for Current-Source Type Single-phase to Three-phase Matrix Converter
Hiroki Takahasi, Ryo Hisamichi and Hitoshi Haga
Sendai National College of Technology, Japan

P2907 Control of Multilevel Direct AC Converters
Jyoti Sastry and Deepak Divan
Georgia Institute of Technology, United States

P2908 Three-Phase Cascaded Multilevel Inverter Using Power Cells with Two Inverter Legs in Series
Gierri Waltrich and Ivo Barbi
Federal University of Santa Catarina, Brazil

P2909 DC Link Balancing and Ripple Compensation for a Cascaded-H-Bridge using Space Vector Modulation
John Vodden, Patrick Wheeler and Jon Clare
University of Nottingham, United Kingdom

P2910 A Novel Five-level Three-phase PWM Rectifier using 12 Switches
Jun-ichi Itoh, Noge Yuichi and Taketo Adachi
Nagaoka University of Technology, Japan

P2911 Enhanced Voltage Balancing of a Flying Capacitor Multilevel Converter Using Phase Disposition (PD) Modulation
Brendan P. McGrath and D. Grahame Holmes
Monash University, Australia

P2912 A New Diode-Clamping Multilevel Converter with Reduced Device Count and DC Voltage Balancing Control
Qingquan Tang, Dariusz Czarkowski, Xu Yang and Songsheng Lu
Polytechnic Institute of NYU, United States; New Star Institute of Applied Technology, China

P2913 A New Transformerless Cascaded Multilevel Converter Topology
Kui Wang, Yongdong Li and Zedong Zheng
Tsinghua University, China

P2914 Predictive Control Based Selective Harmonic Elimination With Low Switching Frequency for Multilevel Converters
Samir Kouro, Bruno La Rocca, Patricio Cortes, Salvador Alepuz, Bin Wu and Jose Rodriguez
Ryerson University, Canada; Universidad Tecnica Federico Santa Maria, Chile; Technical University of Catalonia, Spain

P2915 A Single Leg Switched PWM Method for Three-phase H-Bridge Voltage Source Converters
Osman S. Senturk, Lars Helle, Stig Munk-Nielsen, Pedro Rodriguez and Remus Teodorescu
Aalborg University, Denmark; Vestas Wind Systems, Denmark; Technical University of Catalonia, Spain

P2916 High Efficiency Multilevel Uninterruptible Power Supply
Eduardo Kazuhide Sato, Masahiro Kinoshita, Yushin Yamamoto and Tatsuaki Amboh
TMEIC, Japan

POSTER SESSION P8-4: RELIABILITY, DIAGNOSTICS, MODELING AND ANALYSIS

Chair: M. Swamy, Yaskawa America, USA

P3101 An Industry-Based Survey of Reliability in Power Electronic Converters
Shaoyong Yang, Angus Bryant, Philip Mawby, Dawei Xiang, Ran Li and Peter Tavner
University of Warwick, United Kingdom; Durham University, United Kingdom

P3102 Operating Standby Redundant Controller to Improve Voltage Source Inverter Reliability
Alexander Julian, Giovanna Oriti and Stephen Blevins
Naval Postgraduate School, United States; United States Navy, South East RMC, United States

P3103 A Survey of Condition Monitoring and Protection Methods for Medium Voltage Induction Motors
Pinjia Zhang, Yi Du, Thomas Habetler and Bin Lu
Georgia Institute of Technology, United States; Eaton Corporation, United States

P3104 Simple Switch Open Fault Detection Method of Voltage Source Inverter
Shin-Myung Jung, Jin-Sik Park, Hyoung-Suk Kim, Hag-Wone Kim and Myung-Joong Youn
KAIST, Korea (South); Chungju National University, Korea (South)

P3105 Mechanical Transmission and Torsional Vibration Effect on Induction Machine Stator Current and Torque in Railway Traction Systems
Shahin Hedayati Kia, Humberto Henao and Gerard Andre Capolino
University of Picardie - Amiens, France

P3106 Kalman Filter Used for on Line Monitoring and Predictive Maintenance System of Aluminium Electrolytic Capacitors in UPS
Karim Abdennadher, Pascal Venet, Gerard Rojat, Jean Marie Retif and Christophe Rosset
Schneider Electric, France; AMPERE Laboratory, France

P3107 Monte-Carlo Study on a Large-Scale Power System Model in Real-Time using eMEGAsim
Jean-Nicolas Paquin, Jean Belanger, Laurence A. Snider, Claudio Pirolli and Wei Li
OPAL-RT Technologies Inc., Canada; Consultant to OPAL-RT Technologies Inc., United States

P3108 Modeling, Analysis and Design for Hybrid Power Systems with Dual-Input DC-DC Converter
Yan Li, Xinbo Ruan, Dongsheng Yang and Fuxin Liu
HUST, China; Nanjing Univ. of Aeronautics and Astronautics, China

P3109 Modeling and Analysis of the Dead-Time Effects in Parallel Two-Level Voltage Source Inverters
Toni Itkonen, Julius Luukko and Riku Pollanen
Lappeenranta University of Technology LUT, Finland

P3110 A Novel Transformer for Contactless Energy Transmission Systems
Wei Zhang, Qianhong Chen, Siu Chung Wong, Chi K. Tse and Xinbo Ruan
Hong Kong Polytechnic University, Hong Kong; Nanjing Univ. of Aeronautics and Astronautics, China

P3111 The Role of Electricity in Energy Efficiency Power Conversion: a Markal Application for Energy Planning
Norma Anglani, Giuseppe Muliere and Giovanni Petrecca
Pavia University, Italy

P3112 Steady State Analysis of a Capacitively Coupled Contactless Power Transfer System
Chao Liu and Aiguo Patrick Hu
University of Auckland, New Zealand

P3113 Creating Low-Cost Energy-Management Systems for Homes Using Non-Intrusive Energy Monitoring Devices
Rebecca Sawyer, Jason Anderson, Edward Foulks, John Troxler and Robert Cox
University of North Carolina at Charlotte, United States

P3114 Detecting and Locating the Stator Turn-to-turn Faults in a Closed-loop Multiple-motor Drive System
Siwei Cheng, Pinjia Zhang and Thomas Habetler
Georgia Institute of Technology, United States

P3115 Investigation on Surge Testing for Winding Insulation Fault Detection in an Online Environment
Stefan Grubic, Bin Lu, Jose M. Aller and Thomas Habetler
Georgia Institute of Technology, United States; Eaton Corporation, United States; Universidad Simon Bolivar, Venezuela

P3116 Modeling and Control Design of Distributed Power Flow Controller based-on Per-phase Control
Wenchao Song, Xiaohu Zhou, Zhigang Liang, Subhashish Bhattacharya and Alex Huang
North Carolina State University, United States

P3117 Design and Analysis on Reduced Switching Frequency Current Mode Control Isolated Power Converters for Light Load Efficiency
Ruiyang Yu and Bryan M.H. Pong
University of Hong Kong, Hong Kong

Wednesday, September 23, 2009
3:15PM-5:00PM
Second Level, Gateway Foyer,

POSTER SESSION P8-5: DRIVES AND THERMAL CONSIDERATIONS
Chair: R. Tallam, Rockwell Automation, USA

P1901 A Comparative Study of Luenberger Observer, Sliding Mode Observer and Extended Kalman Filter for Sensorless Vector Control of Induction Motor Drives
Yongchang Zhang, Zhengming Zhao, Ting Lu, Liqiang Yuan, Wei Xu and Jianguo Zhu
Tsinghua University, China; University of Technology, Sydney, Austria

P1902 Novel Coil Arrangement of an Integrated Displacement Sensor with Reduced Influence of Suspension Fluxes for a Wide Gap Bearingless Motor
Naoki Tsukada, Takayoshi Onaka, Junichi Asama, Akira Chiba and Tadashi Fukao
Tokyo University of Science, Japan; Shizuoka University, Japan; Motor Solution Co., Ltd, Japan

P1903 Evaluating the Practical Low Speed Limits for Back-EMF Tracking-Based Sensorless Speed Control Using Drive Stiffness as a Key Metric
Robert Hejny and Robert Lorenz
University of Wisconsin - Madison, United States

P1904 Phase Modulation-Based Technique for Saliency Position Estimation of IPMSMs
Alfio Consoli, Giuseppe Scarcella, Giacomo Scelba, Antonio Testa and Semyon Royak
DIEES - University of Catania, Italy; University of Catania, Italy; University of Messina, Italy; Rockwell Automation, United States

P1905 Active Flux Based Motion-Sensorless Vector Control of DC-Excited Synchronous Machines
Claudio Rossi, Domenico Casadei, Alessio Pilati, Ion Boldea and Gheorghe-Daniel Andrescu
University of Bologna, Italy; University Politehnica of Timisoara, Romania

P1906 Dead-beat Direct Torque and Flux Control of Interior Permanent Magnet Machines with Discrete Time Stator Current and Stator Flux Linkage Observer
Jaesuk Lee, Chan-Hee Choi, Jul-Ki Seok and Robert Lorenz
University of Wisconsin - Madison, United States; Yeungnam University, Korea (South)

P1907 A Converter Based Adjustable Speed Drive for Doubly Fed Induction Machine with Centrifugal Loads
Xibo Yuan, Jianyun Chai and Yongdong Li
Tsinghua University, China

P1908 Observer Based Inverter Disturbance Compensation
Xinmei Yuan, Ian Brown, Robert Lorenz and Arui Qui
Tsinghua University, China; University of Wisconsin - Madison, United States

P1909 Digital Control Strategy to Optimize Efficiency of BLDC Motor Driver with VOPFC
Chia- Hao Wu and Ying-Yu Tzou
National Chiao Tung University, Taiwan

P1910 Single-Controllable-Switch-Based Switched Reluctance Motor Drive for Low-Cost Variable- Speed Applications
Jaehyuck Kim and Ramu Krishnan
Virginia Tech, United States

P1911 Minimum Power Loss Control - Thermoelectric Technology in Power Electronics Cooling
Jin Wang, Ke Zou and Friend Jeremiah
Ohio State University, United States

P1912 Effect of Supply Network Harmonics to Frequency Converter Intermediate Circuit Capacitor Temperatures
Valtteri Mattsson and Jouko Niiranen
ABB Oy Drives, Finland

P1913 Evaluation of Zero Vectors in DTC Control of Synchronous Machines and its Effect on Losses
Samer Shisha and Chandur Sadarangani
KTH (Royal Institute of Technology), Sweden

P1914 A Modular Multilevel PWM Inverter for Medium-Voltage Motor Drives
Makoto Hagiwara, Kazutoshi Nishimura and Hirofumi Akagi
Tokyo Institute of Technology, Japan

P1915 Switching Loss Analysis of Modulation Methods Used in Neutral Point Clamped Converters
Daniel Andler, Samir Kouro, Marcelo Perez, Jose Rodriquez and Bin Wu
Universidad Tecnica Federico Santa Maria, Chile; Ryerson University, Canada

P1916 Torque Ripple Suppression Control for PM Motor with High Bandwidth Torque Meter
Kento Nakamura, Hiroshi Fujimoto and Masami Fujitsuna
Yokohama National University, Japan; Denso Corporation, Japan

POSTER SESSION P8-6: RENEWABLE AND ALTERNATIVE ENERGY
Chair: J. Choi, Chungbuk National University, South Korea

P2101 Adaptive Nonlinear Maximum Power Point Tracker for a WECS Based on Permanent Magnet Synchronous Generator Fed by a Matrix Converter
Majid Pahlevaninezhad, Alireza Safaee, Suzan Eren, Alireza Bakhshai and Praveen K. Jain
Queen's University, Canada

P2102 PV Power System Using Buck/Forward Hybrid Converters for LED lighting
S.-Y. Fan, S.-Y. Tseng, Y.-J. Wu and J.-D. Lee
Wufeng Institute of Technology, Taiwan; Chang-Gung University, Taiwan

P2103 Low-cost converter for harvesting of microwave electromagnetic energy
Boubekeur Merabet, Bruno Allard, Hakim Takhedmit, Christian Vollaire and Francois Costa
Laboratoire SATIE-UMR8029, Cachan, France; INSA de Lyon, AMPERE Lab, France; Laboratoire Ampere-UMR5005, Lyon, France

P2104 Optimization of the Operating Point of a Vanadium Redox Flow Battery
Christian Blanc and Alfred Rufer
Ecole Polytechnique Federale de Lausanne, Switzerland

P2105 Battery-Utility Interface Using Soft Switched AC Link supporting Low Voltage Ride Through
Mahshid Amirabadi, Hamid Toliyat and William Alexander
Texas A and M University, United States; Ideal Power Converters, Inc., United States

P2106 Why Hybridization of Energy Storage is Essential for Future Hybrid, Plug-in and Battery Electric Vehicles
John M. Miller, Uday Deshpande, Thomas J. Dougherty and Theodore Bohn
Maxwell Technologies, Inc., United States; Monolith Engines, Inc., United States; Argonne National Laboratory, United States

P2107 Power Sharing in a Double-Input Buck Converter Using Dead-Time Control
Venkata Ananad Kishore Prabhala, Deepak Somayajula and Mehdi Ferdowsi
Missouri University of Science and Technology, United States

P2108 Integration of a Low Frequency, Tunable MEMS Piezoelectric Energy Harvester and a Thick Film Micro Capacitor as a Power Supply for Wireless Sensor Nodes
Lindsay Miller, Christine Ho, Padraic Shafer, Paul Wright, James Evans and R. Ramesh
University of California, Berkeley, United States

P2109 A Novel Maximum Power Point Tracking (MPPT) Algorithm for Ocean Wave Energy Devices
Ean Amon, Al Schacher and Ted Brekken
Oregon State University, United States; Columbia Power Technologies, United States

P2110 An Active Current Ripple Compensation Technique in Grid Connected Fuel Cell Applications
Mario Cacciato, Alfio Consoli, Salvatore De Caro and Antonio Testa
University of Catania, Italy; University of Messina, Italy

P2111 A new Multifunctional Power Converter for Grid Connected Residential Photovoltaic Applications
Engin Ozdemir and Fatih Kavaslar
Kocaeli University, Turkey; Mavisis Technology, Turkey

P2112 Effects of Nonlinear Efficiency Characteristics on the Power-Tracking Control: A Case Study of Hydrokinetic Energy Conversion System
Jahangir Khan, Tariq Iqbal and John Quaicoe
Powertech Labs Inc., Canada; Memorial Univ. of Newfoundland, Canada

P2113 Optimal Placement of Hybrid PV-Wind Systems using Genetic Algorithm
Mohammad A.S. Masoum, Seyed Mahdi Mousavi Badejani and Mohsen Kalantar
Curtin University of Technology, Perth, WA, Australia; Iran University of Science andTechnology, Tehran, Iran

P2114 Comparison Among Stabilization Methods of Fixed Speed Wind Generator System
Mohd. Hasan Ali and Bin Wu
University of South Carolina, United States; Ryerson University, Canada

P2115 Future Home Uninterruptible Renewable Energy System with Vehicle-to-Grid Technology
Igor Cvetkovic, Timothy Thacker, Dong Dong, Gerald Francis, Vladimir Podosinov, Dusham Boroyenon, Fred Wang, Rolando Burgos, Glenn Skutt and John Lesko
Virginia Tech, United States and VPT- Energy Systems, United States

POSTER SESSION P8-7: APPLICATIONS OF POWER ELECTRONICS AND DRIVES
Chair: M. Pucci, ISSIA-CNR, Italy

P2301 A Novel Electrical Power Supply for Electrothermal and Electrochemical Removal Machining Methods
David Tastekin, Harry Kroetz, Clemens Gerlach and Joerg Roth-Stielow
Universitaet Stuttgart, Germany; ETH Zuerich, Switzerland; SFL GmbH, Germany

P2302 Vector Control of Single-Phase Voltage Source Converters based on Fictive Axis Emulation
Alfred Rufer, Behrooz Bahrani, Stephan Kenzelmann and Luiz Lopes
Ecole Polytechnique Federale de Lausanne, Switzerland; Concordia University, Canada

P2303 A Novel Three-Phase, Switched Multi-Winding Power Electronic Transformer
Ranjan Gupta, Krushna Mohapatra and Ned Mohan
University of Minnesota, United States

P2304 A New Single-phase Voltage Sag/Swell Compensator using Direct Power Conversion
Lee Sanghoey, Cha Hanju and Han Byung-Moon
Chungnam National University, Korea (South); Myongji Engineering University, Korea (South)

P2305 Active Power Transfer Capability of Shunt Family of FACTS Devices Based on Angle Control
Babak Parkhideh and Subhashish Bhattacharya
North Carolina State University, United States

P2306 All Nodes Voltage Regulation and Line Loss Minimization in Loop Distribution Systems Using UPFC
Mahmoud Sayed and Takaharu Takeshita
Nagoya Institute of Technology, Japan

P2307 DPFC Control during the Shunt Converter Failure
Zhihui Yuan, Sjoerd de Haan and Jan Abraham Ferreira
Technical University of Delft, Netherlands

P2308 Evaluation of AFD Islanding Detection Methods Based on NDZs Described in Power Mismatch Space
Xuancai Zhu, Guoqiao Shen and Dehong Xu
Zhejiang University, China

P2309 Control Algorithm for a SSSC with a predictive synchronization algorithm.
Pablo Fernandez-Comesana, Jesus Doval-Gandoy, Francisco Freijedo and Jano Malvar
University of Vigo, Spain

P2310 Digital Control of Switch-mode Pulsed GMAW Welding Power
Deshang Sha and Xiaozhong Liao
Beijing Institute of Technology, China

P2311 Energy Recovery Circuit Using an Address Voltage Source for PDPs
Kang-Hyun Yi, Bong-Chul Kim and Gun-Woo Moon
KAIST, Korea (South)

P2312 A Wide-Speed High Torque Capability Utilizing Overmodulation Strategy for Direct
Auzani Jidin, Nik Rumzi Nik Idris, Halim Yalim and Malik Elbuluk
Universiti of Teknologi Malaysia, Malaysia; University of Akron, United States

P2313 Design Considerations for a Stator Side Voltage Regulated Permanent Magnet AC Generator
Neal Clements, Giri Venkataramanan and Thomas Jahns
University of Wisconsin - Madison, United States

P2314 Single-Phase PFC Boost Converter Operating at Instantaneous Power Interruption
Tiago K. Jappe and Samir A. Mussa
Federal University of Santa Catarina, Brazil

P2315 Bit-Stream Control of Three Phase Reversible Rectifiers
Jonathan Bradshaw, Udaya Madawala and Nitish Patel
The University of Auckland, New Zealand

P2316 Shunt Active Filter with Optimum Reference Generation Algorithm for Power Factor and Harmonic Current Compensation
Nils Hoffmann, Lucian Asiminoaei, Steffan Hansen and Friedrich W. Fuchs
Christian-Albrechts-University of Kiel, Germany; Danfoss Drives A/S, Denmark

P2317 Dynamic Performance of Grid Connected AC/DC Voltage Source Converter under Voltage Dips Transient Conditions
Daniel Roiu, Leonardo Limongi, Radu Bojoi and Alberto Tenconi
Politecnico di Torino, Italy

P2318 Zero Sequence Circulating Current Control of Interleaved Three Phase Voltage Source Converters with Discontinuous Space Vector Modulation
Di Zhang, Fred Wang, Rolando Burgos and Dushan Boroyevich
Virginia Tech, United States

POSTER SESSION P8-8: PM MACHINES, LINEAR MACHINES AND GENERATORS
Chair: K. Akatsu, Shibaura Institute of Technology, Japan

P1701 Performance Characteristics of an Inverse-Saliency PM Machine in a Vector Control Drive Configuration
Roberto Moncada, Juan Tapia and Thomas Jahns
University of Concepcion, Chile; University of Wisconsin - Madison, United States

P1702 Sensorless Characteristics of Hybrid PM Machines at Zero and Low Speed
Torben Matzen and Peter Rasmussen
Aalborg University, Denmark

P1703 Development of Electric Powertrain with a Boost Converter for the Fuel Cells Plug-in Electric Scooter
Chen-Yen Yu, Ming-Shi Huang and Jung-Ho Cheng
National Taiwan University, Taiwan; National Taipei University of Technology, Taiwan

P1704 Double Channel PM Motor for Avionic Applications: Impact of Winding Topology
Nicolas Velly, Noureddine Takorabet, Farid Meibody-Tabar, Pierre-Yves Liegeois, Florent Nierlich, F.N.Leynaert and G. Humbert
Nancy University INPL - GREEN, France; Messier-Bugatti SAFRAN Group, France

P1705 Comparison of Efficiency for a PI and a FLC Based IPMSM Drive Incorporating Loss Minimization Algorithm Over Wide Speed Range
Mohammad Uddin and Ronald Rebeiro
Lakehead University, Canada

P1706 Stator Design of a Multi-Consequent-pole Bearingless Motor with Toroidal Winding
Ryo Nakamura, Kosuke Kamiya, Akira Chiba, Junichi Asama and Tadashi Fukao
Tokyo University of Science, Japan; Shizuoka University, Japan; Motor Solution Co., Ltd, Japan

P1707 The Shape Design of Interior Type Permanent Magnet BLDC Motor for Minimization of Mechanical Vibration
Gyu-Hong Kang, Jin Hur, Byoung-Kuk Lee and Byoung-Woo Kim
Korea Marine Equipment Research Institute, Korea (South); University of Ulsan, Korea (South); University of Sungkyunkwan, Korea (South); University Ulsan, Korea (South)

P1708 An Improved AC Standstill Method for Testing Inductances of Interior PM Synchronous Motor Considering Cross-magnetizing Effect
Tao Sun, Soon-O Kwon, Jeong-Jong Lee and Jung-Pyo Hong
Hanyang University, Korea (South)

P1709 Lumped Parameter Magnetic Circuit Model for Fractional-Slot Concentrated-Winding Interior Permanent Magnet Machines
Jagadeesh Tangudu, Thomas Jahns, Ayman EL-Refaie and Z.Q. Zhu
University of Wisconsin - Madison, United States; GE Global Research Center, United States; University of Sheffield, United Kingdom

P1710 Optimization of a High Force Tubular Linear Drive Concept with Discrete Wound Coils to Fullfill Safety Standards in Industrial Applications
Sebastian Gruber, Christian Junge, Florian Senicar and Stefan Soter
University of Wuppertal, Germany; LTi DRiVES GmbH, Germany; Retostronik GmbH, Germany

P1711 Design of linear alternators for thermoacoustic machines
Andrea Rossi, Fabio Immovilli, Claudio Bianchini, Alberto Bellini and Giovanni Serra
DISMI-University of Modena and Reggio Emilia, Italy; DIE-University of Bologna, Italy

P1712 A Miniature Short Stroke Linear Actuator and its Position Control for a Haptic Key
Gregory Savioz and Yves Perriard
Ecole Polytechnique Federale de Lausanne, Switzerland

P1713 Suitable Design of a PMSG for a Large-scale Wind Power Generator
Hiroshi Haraguchi, Masayuki Sanada and Shigeo Morimoto
Osaka Prefecture University, Japan

P1714 Optimal Design of PM Assisted Synchronous Reluctance Generators using Lumped Parameter Model and Differential Evolution Strategy
Jeihoon Baek, Mina M. Rahimian and Hamid A. Toliyat
Texas A and M University, United States

P1715 Voltage Control in Starter/Generator SRM Based Systems
Augusto Silveira, Augusto Fleury, Darizon Andrade, Luciano Gomes, Carlos Bissochi, and Roberto Dias
Universidade Federal de Uberlandia, Brazil; Universidade Catolica de Goias, Brazil

Thursday, September 24, 2009
8:30AM-10:10AM

Session S9-1a: ac-ac Converters and Applications
SECOND LEVEL, CEDAR
Chair: G. Venkataramanan, University of Wisconsin-Madison, USA

8:30AM Generalized Pulse-Width-Modulation to Reduce Common-Mode Voltage in Matrix Converters
Fabricio Bradaschia, Marcelo C. Cavalcanti, Edorta Ibarra, Francisco A. S. Neves and Emilio Bueno
Federal University of Pernambuco, Brazil; University of the Basque Country, Spain; University of Alcala, Spain

8:55AM A Three-Port Interface Converter by Using an Indirect Matrix Converter with the Neutral Point of the Motor
Teck Chiang Goh and Jun-ichi Itoh
Nagaoka University of Technology, Japan

9:20AM Application of Three-phase to Single-phase Matrix Converter to Gas Engine Cogeneration System
Yushi Miura, Satoshi Horie, Tomofumi Amano, Shinichiro Kokubo, Toshifumi Ise, Toshinari Momose and Yuki Sato
Osaka University, Japan

9:45AM Comparison of IGBT Cycling Capabilities For Different AC/AC Topologies
Lixiang Wei, Thomas A. Lipo and Richard Lukaszewski
Rockwell Automation, United States; University of Wisconsin - Madison, United States

Session S9-2a: Digital Control of dc-dc Converters
SECOND LEVEL, PINE
Chair: : M. Harke, Hamilton Sundstrand, USA

8:30AM Oversampled Digital Power Controller with Bumpless Transition Between Sampling Frequencies
Simon Effler, Zdravko Lukic and Aleksandar Prodic
University of Limerick, Ireland; University of Toronto, Canada

8:55AM Fully Digital Hysteretic Modulator for DC-DC Switching Converters
Luca Corradini, Aleksandar Bjeletic, Regan Zane and Dragan Maksimovic
University of Colorado at Boulder, United States

9:20AM Digital Charge Balance Controller with Low Gate Count to Improve the Transient Response of Buck Converters
Eric Meyer, Zhiliang Zhang and Yan-Fei Liu
Queen's University, Canada; Nanjing University of Aeronautics, Astronautics, China

9:45AM Near Time-Optimal Transient Response in DC-DC Buck Converters Taking into Account the Inductor Current Limit
Amir Babazadeh, Luca Corradini and Dragan Maksimovic
University of Colorado at Boulder, United States

Session S9-3a: Solar Photovoltaic Systems
LOWER LEVEL, SAN JOSE/SANTA CLARA
Chair: S. Mazumder, University of Illinois Chicago, USA

8:30AM Study on Unified Control of Grid-connected Generation and Harmonic Compensation in Dual-stage High-capacity PV system
Jing Li, Fang Zhuo, Xianwei Wang, Bo Wen, Lin Wang, Song Ni and Jinjun Liu
Xi'an Jiaotong University, China; Jiangsu Linyang Electronics Co., Ltd., China

8:55AM A Photovoltaic Module Thermal Model Using Observed Insolation and Meteorological Data to Support a Long Life, Highly Reliable Module-Integrated Inverter Design by Predicting Expected Operating Temperature
Robert S. Balog, Yingying Kuai and Greg Uhrhan
Texas A and M University, United States; University of Illinois, United States; SmartSpark Energy Systems, United States

9:20AM Analytical Versus Neural Real-time Simulation of a Photovoltaic Generator
Maria Carmela Di Piazza, Marcello Pucci, Antonella Ragusa and Gianpaolo Vitale
ISSIA-CNR, Italy

9:45AM Performance Evaluation of Solar Photovoltaic Arrays Including Shadow Effects using Neural Network
Dzung Nguyen, Brad Lehman and Sagar Kamarthi
GT Solar, United States; Northeastern University, United States

Session S9-4a: Distributed Generation and Utility Applications
LOWER LEVEL, CARMEL/MONTEREY
Chair: H. Akagi, Tokyo Institute of Technology, Japan

8:30AM An Accurate Power Control Strategy for Inverter Based Distributed Generation Units Operating In a Low Voltage Microgrid
Yun Wei Li and ChingNan Kao
University of Alberta, Canada

8:55AM Single-Phase Islanding Detection based on Phase-Locked Loop Stability
Timothy Thacker, Rolando Burgos, Fred Wang and Dushan Boroyevich
Virginia Tech, United States

9:20AM Novel Islanding Detection Method for Distributed Generation
Byung-Moon Han, Hye-Yeon Lee and Han-Ju Cha
Myongji University, Korea (South); Chungnam National University, Korea (South)

9:45AM Fault Current Contribution of Various Distributed Generation Technologies for Different Power System Topologies
Ahmed Massoud, Shehab Ahmed, Steven Finney and Barry Williams
Texas A and M University, Qatar; Strathclyde University, United Kingdom

Session S9-5a: Modeling, Design and Control Techniques
LOWER LEVEL, SAN MARTIN/SAN SIMEON
Chair: A. Kawamura, Yokohama University, Japan

8:30AM Designing Multiple Inverter Systems with Evolutionary Multiobjective Optimisation
Adam Berry and David Cornforth
CSIRO, Australia

8:55AM Modified Projected Cross Point Control - A Small Signal Analysis
Mostafa Khazraei and Mehdi Ferdowsi
Missouri University of Science and Technology, United States

9:20AM Power Conversion Modeling Methodology Based on Building Block Models
Leonardo Laguna, Roberto Prieto, Oliver Jesus Angel, Jose Antonio Cobos, Horacio Visairo-Cruz and Pavan Kumar
Universidad Politecnica de Madrid, Spain; Intel Corporation, Mexico; Intel Corporation, United States

9:45AM Dynamic Modeling of Power Electronic Systems
Luis Garces, Xianghui Huang, Chunchun Xu and Paul Szczesny
GE Global Research, United States

Session S9-6a: EMI Analysis and Suppression Techniques
LOWER LEVEL, SAN CARLOS/SAN JUAN
Chair: D. Perreault, Massachusetts Institute of Technology, USA

8:30AM Modeling of Integrated EMI Filter with Flexible Multi-layer (FML) Foils
Xiaofeng Wu, Zhiwei Wen, Dehong Xu, Yasuhiro Okuma and Kazuaki Mino
Zhejiang University, China; Fuji Electric Systems Co., Ltd, Japan; Fuji Electric Advanced Technology Co., Ltd, Japan

8:55AM Quantification of Benefits and Drawbacks in Power Conversion Based on Complementary MOS Structures
Manh Hung Tran, Jean-Christophe Crebier and Schaeffer Christian
Grenoble Institute of Technology, France

9:20AM Far Field Extrapolation From Near Field Interactions and Shielding Influence Investigations Based on a FE-PEEC Coupling Method
Jeremie Aime, Thanh Son Tran, Edith Clavel, James Roudet, Jacques Ecrabey and Kien Lai-Dac
G2Elab, Viet Nam; G2Elab, France; Schneider-Electric, France; Grenoble Electrical Engineering lab, France

9:45AM DM EMI Noise Prediction in Constant On-time PFC
Zijian Wang, Shuo Wang, Chuanyun Wang, Fred C. Lee and Pengju Kong
Virginia Tech, United States

Session S9-7a: PM Machine Noise, Vibration and Suspension
SECOND LEVEL, FIR
Chair: P. Rasmussen, Aalborg University, Denmark

8:30AM Influence of Slot and Pole Number Combination on Radial Force and Vibration Modes in Fractional Slot PM Brushless Machines having Single- and Double-layer Windings
Z.Q. Zhu, Z.P. Xia, L.J. Wu and G.W. Jewell
University of Sheffield, United Kingdom

8:55AM Improvements of Radial Force Control for a SPM Type PMSM Self-Bearing Motor Drive
Sheng-Ming Yang and Chih-Chun Chen
National Taipei University of Technology, Taiwan; Tamkang University, Taiwan

9:20AM Vibrationless Alignment Algorithm for Incremental Encoder Based BLDC Drives
Carlo Concari, Giovanni Franceschini and Andrea Toscani
University of Parma, Italy

9:45AM Analytical Model for Predicting Noise and Vibration in Permanent Magnet Synchronous Motors
Rakib Islam and Iqbal Husain
University of Akron, United States

Session S9-8a: Motor Drive Applications and Fault Modes
SECOND LEVEL, OAK
Chair: A. Muetze, Warwick University, UK

8:30AM Prediction of Mechanical Shaft Failures due to Pulsating Torques of Variable Frequency Drives
Joseph Song-Manguelle, Stefan Schroeder, Tobias Geyer, Gabriel Ekemb and Jean-Maurice Nyobe-Yome
GE Global Research, United States; GE Global Research, Germany; The University of Auckland, New Zealand; University of Douala, Cameroon

8:55AM Reliability Considerations and Fault Handling Strategies for Multi-MW Modular Drive Systems
Tobias Geyer and Stefan Schroeder
The University of Auckland, New Zealand; GE Global Research, Germany

9:20AM Performance Evaluation of a Large Capacity VSD System for Oil and Gas Industry
Masahiko Tsukakoshi, Mostafa Al Mamun, Kazunori Hashimura, Hiromi Hosoda and Tetsuya Kojima
Toshiba Mitsubishi Electric Industrial Sys. Co., Japan; Mitsubishi Electric Co., Japan

9:45AM Comparison of Topologies to Drive the Machine of an Automotive Electrical Power Steering with Higher Voltage Levels
Thomas Hackner and Johannes Pforr
University of Applied Sciences Ingolstadt, Germany

Thursday, September 24, 2009 10:45AM-12:00PM

Session S9-1b: Switched-Capacitor Converters
SECOND LEVEL, CEDAR
Chair: G. Venkataramanan, University of Wisconsin-Madison, USA

10:45AM Generic and Unified Model of Switched Capacitor Converters
Sam Ben-Yaakov and Micahel Evzelman
Ben-Gurion University, Israel

11:10AM Improving Dynamic Performance and Efficiency of a Resonant Switched-Capacitor Converter Based on Phase-Shift Control
Kenichiro Sano and Hideaki Fujita
Tokyo Institute of Technology, Japan

11:35AM Zero-Current-Switching Multilevel Modular Switched-Capacitor DC-DC Converter
Dong Cao and Fang Z. Peng
Michigan State University, United States

Session S9-2b: Digital Control of dc-dc Converters
SECOND LEVEL, PINE
Chair: M. Harke, Hamilton Sundstrand,USA

10:45AM Adaptive Digital Slope Compensation for Peak Current Mode Control
Tobias Grote, Heiko Figge, Norbert Froehleke, Frank Schafmeister, Peter Ide and Joachim Boecker
University of Paderborn, Germany; DELTA Energy Systems, Germany

11:10AM A Novel Loop Gain Correction Method for Digitally-Controlled DC-DC Power Converters
Yu-Cheng Lin, Dan Chen, Yen-Tang Wang and Wei-Hsu Chang
National Taiwan University, Taiwan; RichTek Technology Corp., Taiwan

11:35AM Dynamic DC Ramp Shift Digital Control Technique for Improved Transient Response
Majd G. Batarseh, Ehab Shobaki, Haibing Hu, Chris Iannello and Issa Batarseh
University of Central Florida, United States

Session S9-3b: Energy Harvesting
LOWER LEVEL, SAN JOSE/SANTA CLARA
Chair: S. Mazumder, University of Illinois Chicago, USA

10:45AM Power Electronic Circuitry for Energy Harvesting Backpack
Guanghui Wang, Cheng Luo, Lawrence Rome and Heath Hofmann
The Pennsylvania State University, United States; LightningPacks, LLC, United States

11:10AM A Scoping Study of Electric and Magnetic Field Energy Harvesting for Wireless Sensor Networks in Power System Applications
Rohit Moghe, Yi Yang, Deepak Divan and Frank Lambert
Georgia Institute of Technology, United States; NEETRAC, United States

11:35AM Energy Harvest with Microbial Fuel Cell and Power Management System
Andrew Meehan, HongWei Gao and Zbigniew Lewandowski
Montana State University, United States

Session S9-4b: Distributed Generation and Utility Applications
LOWER LEVEL, CARMEL/MONTEREY
Chair: H. Akagi, Tokyo Institute of Technology, Japan

10:45AM Active and Reactive Power Control Schemes for Distributed Generation Systems Under Voltage Dips
Fei Wang, Jorge Duarte and Marcel Hendrix
Eindhoven University of Technology, Netherlands

11:10AM Control of Dynamic Capacitor
Anish Prasai and Deepak Divan
Georgia Institute of Technology, United States

11:35AM A Multi-cell Unified Power Quality Conditioner that Operates with Asymmetrical DC Links Voltages for Minimum THD
Eduardo E. Espinosa, Jose R. Espinoza, Luis A. Moran, Jorge A. Hidalgo and Javier A. Munoz
Concepcion University, Chile

Session S9-5b: Surface PM Machines and Drives
LOWER LEVEL, SAN MARTIN/SAN SIMEON
Chair: B. Mecrow, University of Newcastle, UK

10:45AM Analysis and Tests of a Dual Three-Phase 12-slot 10-pole Permanent Magnet Motor
Nicola Bianchi, Massimo Barcaro and Freddy Magnussen
University of Padova, Italy; ABB Corporate Research, Sweden

11:10AM Development of a Hybrid MEMS BLDC Micromotor
Sebastiano Merzaghi, Christian Koechli and Yves Perriard
EPFL - STI - IMT - LAI, Switzerland

11:35AM A Miniature, 500 000 rpm, Electrically Driven Turbocompressor
Daniel Kraehenbuehl, Christof Zwyssig, Hansjoerg Weser and Johann Walter Kolar
ETH Zurich, Switzerland; Celeroton Ltd., Switzerland; High Speed Turbomaschinen GmbH, Germany

Session S9-6b: EMI Analysis and Suppression
LOWER LEVEL, SAN CARLOS/SAN JUAN
Chair: D. Perreault, Massachusetts Institute of Technology, USA

10:45AM "Black Box" EMC Model for Power Electronics Converter
Mikael Foissac, Jean-Luc Schanen and Christian Vollaire
G2ELab, France; Laboratoire Ampere, France

11:10AM Effect of Duty Cycle on Common Mode Conducted Noise of DC-DC Converters
Qing Ji, Xinbo Ruan, Ming Xu and Fei Yang
Nanjing Univ. of Aeronautics and Astronautics, China; FSP Research and Development Center, China

11:35AM Reducing Common Mode Noise in Two-Switch Forward Converter
Pengju Kong, Shuo Wang, Fred C. Lee and Zijian Wang
Virginia Tech, United States

Session S9-7b: PM Generator Applications

SECOND LEVEL, FIR
Chair: D. Saban, Direct Drive Systems, USA

10:45AM Design and FE Analysis of Surface Mounted Permanent Magnet Motor/Generator for High-speed Modular Flywheel Energy Storage Systems
Parag Upadhyay and Ned Mohan
University of Minnesota, United States

11:10AM Design Aspects of Medium Power Double Rotor Radial Flux Air-cored Stator Permanent Magnet Wind Generators
Abraham Stegmann and Maarten Kamper
University of Stellenbosch, South Africa

11:35AM A Novel Permanent Magnet Tubular Linear Generator for Ocean Wave Energy
Joe Prudell, Martin Stoddard, Ted Brekken and Annette von Jouanne
Columbia Power Technologies, United States; Oregon State University, United States

Session S9-8b: Motor Drive Design and Control Issues

SECOND LEVEL, OAK
Chair: A. Muetze, Warwick University, UK

10:45AM Experimental Verification of Deep Flux-weakening Operation of a 50 kW IPM Machine by Using Single Current Regulator
Yuan Zhang, Longya Xu, Mustafa Guven, Song Chi and Mahesh Illindala
The Ohio State University, United States; Caterpillar Inc., United States; General Electric, United States

11:10AM The Influence of the DC Link Inductor Design on the Rectifier Voltage Stress in an Adjustable Speed Drive During a Mains Voltage Surge
Zoran Vrankovic, Lixiang Wei, Craig Winterhalter and Bok Young Hong
Rockwell Automation, United States

11:35AM Common-Mode Voltage Reduction PWM Algorithm for AC Drives
Rangarajan Tallam, Russel Kerkman, David Leggate and Richard Lukaszewski
Rockwell Automation, United States

Thursday, September 24, 2009
2:00PM-3:15PM

Session S10-1a: Resonant and Z-Source Inverters

SECOND LEVEL, CEDAR
Chair: P. Jain, Queen's University, Canada

2:00PM Dual-Input Dual-Output Z-Source Inverter]
Seyed Mohammad Dehghan, Mustafa Mohamadian, Ali Yazdian and Farhad Ashrafzadeh
Tarbiat Modares University, Iran; Whirlpool Corporation, United States

2:25PM Current-fed Quasi-Z-Source Inverter with Voltage Buck-Boost and Regeneration Capability
Shuitao Yang, Fang Z. Peng, Qin Lei, Ryosuke Inoshita and Zhaoming Qian
Zhejiang University, China; Michigan State University, United States; DENSO CORP., Japan

2:50PM Current-fed Quasi-Z-Source Inverter with Coupled Inductors
Shuitao Yang, Qin Lei, Fang Z. Peng, Ryosuke Inoshita and Zhaoming Qian
Zhejiang University, China; Michigan State University, United States; DENSO CORP., Japan

Session S10-2a: Integrated dc-dc Converters

SECOND LEVEL, PINE
Chair: J.A. Ferreira, T.U. Delft, Netherlands

2:00PM Design and Realization of Highly Integrated Isolated DC/DC Micro-Converter
Olivier Deleage, Jean-Christophe Crebier, Magali Brunet, Yves Lembeye and Hung Tran Manh
Grenoble Institute of Technology, France; LAAS, France; Joseph Fourier University, France

2:25PM A 65-nm-CMOS 100-MHz 87%-Efficient DC-DC Down Converter Based on Dual-Die System-in-Package Integration
Henk Jan Bergveld, Kasia Nowak, Ravi Karadi, Sebastien Iochem, Jorge Ferreira, Sophie Ledain, Eric Pieraerts and Mickael Pommier
NXP Semiconductors, Netherlands; NXP Semiconductors, France

2:50PM An 800mW Fully-Integrated 130nm CMOS DC-DC Step-Down Multi-Phase Converter, With On-Chip Spiral Inductors and Capacitors
Mike Wens and Michiel Steyaert
K.U. Leuven, Belgium

Session S10-3a: Wave Energy Conversion

LOWER LEVEL, SAN JOSE/SANTA CLARA
Chair: A. Zobaa, University of Exeter, UK

2:00PM A Multi-Chamber Oscillating Water Column using Cascaded Savonius Turbines
David Dorrell, Min-Fu Hsieh and Chi-Chien Lin
University of Technology Sydney, Australia; National Cheng Kung University, Tainan, Taiwan

2:25PM Ocean Wave Energy Harvesting Buoy for Sensors
Steven Bastien, Raymond Sepe, Annette Grilli, Stephan Grilli and Malcolm Spaulding
Electro Standards Laboratories, United States; University of Rhode Island, United States

2:50PM Design and Optimization of a Novel Hybrid Transverse / Longitudinal Flux, Wound-Field Linear Machine for Ocean Wave Energy Conversion
Jennifer Vining, Thomas A. Lipo and Giri Venkataramanan
University of Wisconsin - Madison, United States

Session S10-4a: Grid-Connected Converter Applications

LOWER LEVEL, CARMEL/MONTEREY
Chair: M. Manjrekar, Siemens, Germany

2:00PM Experimental Verification of Autonomous Decentralized UPS system with Instantaneous Power Detection using FPGA based Hardware Controller
Toshiya Ishioka, Nobuaki Doi and Tomoki Yokoyama
Tokyo Denki University, Japan

2:25PM Power Decoupling Methods for Single-phase Three-poles AC/DC Converters
Kuo-Hen Chao and Po-Tai Cheng
National Tsing Hua University, Taiwan

2:50PM A Three-Phase Voltage-Source Solar Power Conditioner Using a Single-Phase PWM Control Method
Hideaki Fujita
Tokyo Institute of Technology, Japan

Session S10-5a: Single-Phase Rectifiers

LOWER LEVEL, SAN MARTIN/SAN SIMEON
Chair: M. Elbuluk, University of Akron, USA

2:00PM Light Load Efficiency Improvement for PFC
Qian Li, Fred C. Lee, Ming Xu and Chuanyun Wang
Virginia Tech, United States

2:25PM Two-Stage AC/DC Converter Employing Load-Adaptive Link-Voltage-Adjusting Technique with Load Power Estimator for Notebook Computer Adaptor
Seong-Wook Choi, Byoung-Woo Ryu and Gun-Woo Moon
KAIST, Korea (South); Samsung Electro-mechanics Co. Ltd, Korea (South)

2:50PM Concepts for High Efficiency Single-Phase Three-Level PWM Rectifiers
Marcio Silveira Ortmann, Samir A. Mussa and Marcelo Lobo Heldwein
Federal University of Santa Catarina, Brazil

Session S10-6a: Power Semiconductors and ICs

LOWER LEVEL, SAN CARLOS/SAN JUAN
Chair: A. Skorek, University of Quebec, Canada

2:00PM Parallel Connection of Super-Junction MOSFETs in a PFC Application
Filippo Chimento, Salvatore Musumeci, Angelo Raciti, Alessandro Cannone and Antonino Gaito
University of Catania, Italy; STMicroelectronics, Italy

2:25PM A Circuit-Level Substrate Current Model for Smart-Power IC
Fabrizio Lo Conte, Marc Pastre, Francois Krummenacher, Jean-Michel Sallese and Maher Kayal
EPFL, Switzerland

2:50PM Analysis of the Switching Process of Power MOSFETs Using a New Analytical Losses Model
Miguel Rodriguez, Alberto Rodriguez, Pablo Fernandez and Javier Sebastian
University of Oviedo, Spain

Session S10-7a: Fractional-Slot Winding PM Machines

SECOND LEVEL, FIR

Chair: G. Pellegrino, Poly. Torino, Italy

2:00PM End Effects in Multi-Phase Fractional-Slot Concentrated-Winding Surface Permanent Magnet Synchronous Machines
Ayman El-Refaie and Manoj Shah
GE Global Research Center, United States

2:25PM Self-sensing Comparison of Fractional Slot Pitch Winding vs. Distributed Winding for FW- and FI-IPMSMs Based On Carrier Signal Injection at Very Low Speed
David Reigosa, Kan Akatsu, Natee Limsuwan, Yuichi Shibukawa and Robert Lorenz
University of Oviedo, Spain; Shibaura Institute of Technology, Japan; University of Wisconsin - Madison, United States; Nissan Motor Co., Ltd., Japan

2:50PM Segregation of Torque Components in Fractional-Slot Concentrated-Winding Interior PM Machines Using Frozen Permeability
Jagadeesh Tangudu, T.M. Jahns, Z.Q. Zhu and Ayman El-Refaie
University of Wisconsin - Madison, United States; University of Sheffield, United Kingdom; GE Global Research Center, United States

Session S10-8a: Sensorless Control of Drives

SECOND LEVEL, OAK

Chair: S-K Sul, Seoul National University, South Korea

2:00PM Wide Speed Range Sensorless Control of PM-RSM via "Active Flux Model"
Mihaela-Codruta Paicu, Lucian Tutelea, Gheorghe-Daniel Andrescu, Frede Blaabjerg, Cristian Lascu and Ion Boldea
University Politehnica of Timisoara, Romania; Aalborg University, Denmark; University of Nevada, Reno, United States

2:25PM Integration of Alternating Carrier Injection in Position Sensorless Control Without any Filtering
Wolfgang Hammel and Ralph M. Kennel
SEW-Eurodrive, Germany; Technische Universitaet Muenchen, Germany

2:50PM Ringed-pole Permanent Magnet Synchronous Motor for Position Sensorless Drives
Silverio Bolognani, Adriano Faggion and Nicola Bianchi
University of Padova, Italy

Thursday, September 24, 2009 3:45PM-5:00PM

Session S10-1b: Resonant and Z-Source Inverters

SECOND LEVEL, CEDAR

Chair: P. Jain, Queen's University, Canada

3:45PM Extended Boost Z-source Inverters
Chandana Jayampathi Gajanayake, Fang Lin Luo, Hoay Beng Gooi, Ping Lam So and Lip Kian Siow
Nanyang Technological University, Singapore

4:10PM Research on Third Harmonic Injection Control Strategy of Improved Z-Source Inverter
Shaojun Xie, Yu Tang and Chaohua Zhang
Nanjing University of Aero. and Astro., China

4:35PM Design of Class-E_M Power Amplifier with One Input Signal
Ryosuke Miyahara and Hiroo Sekiya
Chiba University, Japan

Session S10-2b: Integrated dc-dc Converters

SECOND LEVEL, PINE

Chair: J.A. Ferreira, T.U. Delft, Netherlands

3:45PM A DMOS Integrated 320mW Capacitive 12V to 70V DC/DC-Converter for LIDAR Applications
Tom Van Breussegem, Mike Wens, Jean-Michel Redoute, David Geys, Eldert Geukens and Michiel Steyaert
K.U. Leuven, Belgium

4:10PM Digitally Controlled Low-Power DC-DC Converter with Segmented Output Stage and Gate Charge Based Instantaneous Efficiency Optimization
Amir Parayandeh and Aleksandar Prodic
University of Toronto, Canada

4:35PM Resonant Gate Drive for Silicon Integrated DC/DC Converters
Malal Bathily, Bruno Allard, Jacques Verdier and Frederic Hasbani
STMicroelectronics, France; INSA de Lyon, France

Session S10-3b: Power Converters for Solar Energy Systems

LOWER LEVEL, SAN JOSE/SANTA CLARA

Chair: A. Zobaa, University of Exeter, UK

3:45PM Multifunctional Photovoltaic Inverter Systems - Energy Management and Improvement of Power Quality and Reliability in Industrial Environments
Dominik Geibel
ISET e.V., Germany

4:10PM A Novel Current Sensing DC Offset Compensation Strategy in Transformerless Grid Connected Power Converters
Emilio Lorenzani, Giovanni Franceschini, Carla Tassoni, Alberto Bellini and Giampaolo Buticchi
University of Parma, Italy; DISMI-University of Modena and Reggio Emilia, Italy

4:35PM High Efficiency Converter with Charge Pump and Coupled Inductor for Wide Input Photovoltaic AC Module Applications
Wensong Yu, Chris Hutchens, Jih-Sheng Lai, Jianhui Zhang, Gianpaolo Lisi, Ali Bjabbari, Greg Smith and Tim Hegarty
Virginia Tech, United States; National Semiconductor, United States

Session S10-4b: Grid-Connected Converter Modeling and Control

LOWER LEVEL, CARMEL/MONTEREY

Chair: M. Manjrekar, Siemens, Germany

3:45PM State-Space Model Identification of a LCL Filter used as interface between a Voltage Source Converter and the Electrical Grid
Francisco Huerta, Santiago Cobreces, Francisco J. Rodriguez, Emilio Bueno and Daniel Pizarro
University of Alcala, Spain

4:10PM Ubiquitous Power Flow Control on Meshed Grids
Frank Kreikebaum, Debrup Das, Jorge Hernandez and Deepak Divan
Georgia Institute of Technology, United States

4:35PM PI State Space Current Control of Grid-Connected PWM Converters with LCL Filters
Joerg Dannehl, Friedrich W. Fuchs and Paul B. Thogersen
Christian-Albrechts-University of Kiel, Germany; KK-Electronic A/S, Denmark

Session S10-5b: Plug-in Vehicle Utility Interface

LOWER LEVEL, SAN MARTIN/SAN SIMEON

Chair: M. Elbuluk, University of Akron, USA

3:45PM A Low-cost, Digitally-controlled Charger for Plug-in Hybrid Electric Vehicles
Lixin Tang and Gui-Jia Su
Oak Ridge National Lab., United States

4:10PM Multi-Function Bi-directional Battery Charger for Plug-in Hybrid Electric Vehicle Application
Xiaohu Zhou, Gangyao Wang, Srdjan Lukic, Subhashish Bhattacharya and Alex Huang
North Carolina State University, United States

4:35PM Real-Time Modeling of Distributed Plug-in Vehicles for V2G Transactions
Ganesh Kumar Venayagamoorthy, Pinaki Mitra, Keith Corzine and Chris Hutson
Missouri University of Science and Technology, United States

Session S10-6b: Power Semiconductors and ICs

LOWER LEVEL, SAN CARLOS/SAN JUAN

Chair: A. Skorek, University of Quebec, Canada

3:45PM Assessment of uni-axial mechanical stress on Trench IGBT under severe operating conditions: a 2D physically-based simulation approach
Yassine Belmehdi, Stephane Azzopardi, Jean-Yves Deletage and Eric Woirgard
University of Bordeaux, France

4:10PM Modeling of Internal Transparent Collector IGBTs and the Extraction of Electron Lifetime in Nano-Voids Layer
Dongqing Hu, Johnny K.O. Sin, Yu Wu, Baowei Kang and Yunpeng Jia
Beijing University of Technology, China; The Hong Kong University of Sci. and Tech., Hong Kong

4:35PM Characterization of a new 4.5 kV Press Pack SPT+ IGBT for Medium Voltage Converters
Rodrigo Alvarez, Felipe Filsecker and Steffen Bernet
Dresden University of Technology, Germany

Session S10-7b: Machine Design and Analysis Techniques

SECOND LEVEL, FIR

Chair: Y. Perriard, EPFL, Switzerland

3:45PM Reduction of Magnet Eddy Current Loss in Interior Permanent Magnet Motors with Concentrated Windings
Katsumi Yamazaki, Yuji Kanou, Yu Fukushima, Shunji Ohki, Akira Nezu, Takeshi Ikemi and Ryouichi Mizokami
Chiba Institute of Technology, Japan; Nissan Motor Co., LTD, Japan

4:10PM Calculation of Starting Torque in Skewed-Rotor Cage Induction Motor with Broken Bar and Rotor Eccentricity using Hybrid Analytical/Finite Element Analysis Technique
David Dorrell, Lucia Frosini, Marcello Bottani and Giacomo Galbiati
University of Technology Sydney, Australia; University of Pavia, Italy

4:35PM A Computationally Efficient Finite-Element/Analytical-Solver-Based Technique for Simulating Rotor Movement in Electric Machines
Danhong Zhong and Heath Hofmann
Penn State University, United States

Session S10-8b: Sensorless Control of Drives

SECOND LEVEL, OAK

Chair: : S-K Sul, Seoul National University, South Korea

3:45PM Sensorless Control of Three-Pole Active Magnetic Bearings Using Saliency-tracking Based Methods
Pablo Garcia, Juan M. Guerrero, Fernando Briz and David Reigosa
University of Oviedo, Spain

4:10PM Sensorless Operation of an Ultra-High Speed Switched Reluctance Machine
Christopher Bateman, Barrie Mecrow, Andrew Clothier, Paul Acarnley and Nicholas Tufnell
Newcastle University, United Kingdom; Dyson Ltd, United Kingdom

4:35PM Sensorless Direct Torque and Flux Control for Matrix Converter IPM Synchronous Motor Drives Using Adaptive Sliding Mode Observer Combined with High Frequency Signal Injection
Dan Xiao, Gilbert Foo and Muhammed Rahman
University of New South Wales, Australia