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P142 *Novel Integrable 80V Silicon Lateral Trench Power MOSFETs for High Frequency DC-DC Converters*
Kamal Varadarajan, Abhiskek Sinkar and Paul Chow 1013

P143 *High-Voltage, High-Frequency SiC Power MOSFETs Model Validation*
Jose M. Ortiz-Rodriguez, Tam Duong, Angel Rivera-Lopez and Allen R. Hefner 1018

Plenary Poster Session: Integration, Packaging and Modules, Room: International Ballroom Center and South

P144 *Low voltage floating supply in monolithic high voltage technology for high dV/dt applications*
Enrico Dallago, Stefano Ruzza, Giuseppe Venchi and Sergio Morini 1024

P145 *Thermal Design Considerations for Integrated Power Electronics Modules based on Temperature Distribution Cases Study*
Chen Qiaoliang, Yang Xu, Wang Zhaoan, Zhang Lianghua and Zheng Ming 1029

P146 *Electric Characteristics of Planar Interconnect Technologies for Power MOSFETs*
Sibylle Dieckerhoff, Tino Kirfe, Thies Wernicke, Christine Kallmayer and Andreas Ostmann 1036

P147 *Design Considerations for Passive Substrate with Ferrite Materials Embedded in Printed Circuit Board (PCB)*
Chen Qiaoliang, Gong Zhankun, Yang Xu, Wang Zhaoan and Zhang Lianghua 1043

P148 *A Fully Integrated 300 C, 4 kW, 3-Phase, SiC Motor Drive Module*
Jared Hornberger, Edgar Cilio, Brice McPherson, Roberto Schupbach and Alex Lostetter 1048

Plenary Poster Session: Power Quality and Utility Applications, Room: International Ballroom Center and South

P149 *Dynamic Response Improvement of a Three-Phase Line Interactive UPS System with Active Power Line Conditioning*
Sergio Silva, Rodrigo Modesto and Lucio Reis 1055

P150 *A New Control Strategy of UPQC in Three-phase Four-wire System*
Zhili Tan, Xun Li, Jian Chen, Yong Kang and Zhao Yang 1060

P151 *Analysis of Line Rush Current in Short Commutation for SHAPF*
Liqing Tong, Zhaoming Qian, Naixing Kuang, Lingxiao Xue and Fang Zheng Peng 1066

P152 *Optimal Design of Synchronous Reference Frame Harmonic Detection Method*
Liqing Tong, Zhaoming Qian, Naixing Kuang, Lingxiao Xue and Fang Zheng Peng 1071

P153 *Asymmetrical H-PFC for Low Line Applications*
Xiaoni Xin, Teng Liu, John Zeng, Hongyang Wu and Jianping Ying 1077

P154 *A Novel Power Supply System Based on a Packet Exchange Network Architecture*
Shigeru Tajima and Yoshifumi Nishida 1082

P155 *Development of a 6.6 kV - 1 MVA Transformerless Loop Balance Controller*
Naotaka Okada, Masahiro Takasaki, Hiromitsu Sakai and Shuji Katoh 1087

P156 *A Computationally Efficient RDFT Based Reference Signal Generator for Active Compensators*
Herbert Ginn, Konstantin Borisov and Guangda Chen 1092

P157 *A Novel Hybrid Series Active Filter for Power Quality Compensation*
Salem Rahmani, Abdelhamid Hamadi and Kamal Al haddad 1099

P158 *Stability Analysis and Controller Design of Hybrid Compensation System with Parallel Active Power Filter and Parallel Capacitors*
Longhui Wu, Fang Zhuo, Pengbo Zhang, Hui Li and Zhaoan Wang 1105

P159 *A Novel Control of Series Active Power Filter without Harmonics Detection*
Chang Yuan, Jinjun Liu, Xiaoyu Wang and Zhaoan Wang 1112

P160 *Implementation of the Wiener Filter for Extracting Power Quality Disturbances*
Amr Elnady, Aboelmagd Noureldin and Yan-Fei Liu 1116

P161 *A Novel Vector Controlled Current Source Shunt Active Power Filter with Reduced Component Voltage Stresses*
Perttu Parkatti, Mika Salo and Heikki Tuusa 1121

P162 *An Inter-harmonic Detecting Algorithm Based on the Generalized dk-qk Coordinate Transform*
Ruikai Xie, Bo Zhang, Dongyuan Qiu and Chen Lianggang 1126

P163 *A Research on the Application of Phase Shift Control for Active Voltage Quality Regulator*
Jixu Zhang, Guochun Xiao, Zhanghe Nan, Zhiliang Hu and Beihai Chen 1132

P164 *LQR with Integral Action to Enhance Dynamic Performance of Three-Phase Three-Wire Shunt Active Filter*
Bachir Kedjar and Kamal Al-Haddad 1138

P165 *Harmonic Propagation Damping in Ring Power Distribution Systems using an Active Filter*
Marco Contreras, Victor Cardenas and Hugo Calleja 1145

P166 *Islanding Detection Using a Coordinate Transformation Based Phase-Locked Loop*
Timothy Thacker, Fred Wang, Rolando Burgos and Dushan Boroyevich 1151

P167 *A Fluorescent Lamp with Integral Proximity Sensor for Building Energy Management*
John Cooley, Al-Thaddeus Avestruz, Steven Leeb and Les Norford 1157

P168 *Controller Design of Power Quality-Improving Appliances*
Donald Hammerstrom, Ning Lu and Ning Zhou 1164

P169 *A Novel Single-Phase Reduced Parts On-Line UPS with Power Quality Conditioning Capability*
Mohsen Shafiee Khoor and Mohamed Machmoum 1170

P170 *Hybrid Control Scheme for a Single-Phase Shunt Active Power Filter*
Homero Miranda, Victor Cardenas, Gonzalo Sandoval and Gerardo Espinosa-Perez 1176

P171 *Analysis of a Virtual Air Gap Variable Reactor*
Dale Dolan and Peter Lehn 1182

P172 *A Family of Voltage-Mode Control Methods for Active Power Filters and Comparative Analysis*
Xiaoyu Wang, Jinjun Liu, Guopeng Zhao, Chang Yuan, Zhaoan Wang and Jing Li 1188

P173 *Generation of Unbalanced 3-Phase Voltages for Dynamic Voltage Restoration Using the 4-Leg Voltage Source Converter*
S. R. Naidu and D. A. Fernandes 1195

Plenary Poster Session: Alternative and Renewable Energy, Room: International Ballroom Center and South

P174 *Experimental Study of Control Strategy for Wind Generation System*
Yaoqin Jia, Zhaoan Wang and Zhongqing Yang 1202

P175 *A New Islanding Detection Method Based on Hidden Gene Concept*
Jun Yin, Chris Diduch and Liuchen Chang 1208

P176 *A Closed-form Oriented Compensator Analysis for Series-parallel Loosely Coupled Inductive Power Transfer Systems*
Yuan-Hsin Chao, Jenn-Jong Shieh, Ching-Tsai Pan and Wei-Chih Shen 1215

P177 *A Novel Vdc Voltage Monitoring and Control Method for Three-Phase Grid-Connected Inverters*
Zitao Wang and Liuchen Chang 1221

P178 *Design of a two-stage fuel cell based single-phase utility-interactive inverter*
Zan Wang, Lan Xiao, Juan Zhang, Yong Huang and Yangguang Yan 1227

P179 *The Development of Solid Oxide Fuel Cell (SOFC) Emulator*
Abraham Gebregergis and Pragasen Pillay 1232

P180 *Motion sensorless bidirectional PWM converter control with seamless switching from power grid to stand alone and back*
Marius Fatu, Lucian Tutelea, Remus Teodorescu, Frede Blaabjerg and Ion Boldea 1239

P181 *A Single-Phase Grid-Connected Inverter with a Power Decoupling Function*
Fumihiro Shinjo, Keiji Wada and Toshihisa Shimizu 1245

P182 *A New Topology For Grid-Connected Photovoltaic System Using the Converter with Flat Efficiency Curve For All Load Range*
Byung Duk Min, JongPil Lee, Jong Hyun Kim, Tae Jin Kim and Dong Wook Yoo 1250

P183 *Fast Dynamic Response in a Fuel Cell based Converter using Augmented Energy Storage*
Haihua Zhou, Ashwin M Khambadkone and Xin Kong 1255

P184 *A Power Control Scheme to Improve the Performance of a Fuel Cell Hybrid Power Source for Residential Application*
Yujin Song, X. Li, S. I. Park, S. B. Han and H. G. Jeong 1261

P185 *Efficiency Maximization of Permanent Magnet Synchronous Generators coupled to wind turbines*
Antonino Di Tommaso, Rosario Miceli, Giuseppe Ricco Galluzzo and Marco Trapanese 1267

P186 *Line impedance estimation using active and reactive power variation*
Adrian Timbus, Pedro Rodriguez, Remus Teodorescu and Mihai Ciobotaru 1273

P187 *Comparison of Energy Storage System Technologies and Configurations in a Wind Farm*
Wei Li and Geza Joos 1280

Plenary Poster Session: Power Factor Correction, Room: International Ballroom Center and South

P188 *A Novel Method for Current Ripple Control Used in PFC Converter*
Qingbo Hu, Zhengyu Lu and Zhaoming Qian 1287

P189 *Analysis of Line Current Harmonics for Single-Phase PFC Converters*
Ciro Lee Sirio 1291

P190 *A Model for Stability Study of PFC Power Supplies*
Grace Chu, Chi K. Tse and Siu Chung Wong 1298

P191 *Analysis of PWM for Three-phase PFC and Suitable Switching Sequence for Partial Resonance*
Tetsuya Oshikata, Yusuke Saito and Hirofumi Matsuo 1304

P192 *A New Zero-Ripple Boost Converter with Separate Inductors for Power Factor Correction*
Dodi Garinto 1309

P193 *Boost Rectifier Power Factor Correction Circuits with Improved Harmonic and Load Voltage Regulation Responses*
Peter Wolfs and Peter Thomas 1314

P194 *Strategy for Current Harmonic Reduction of PFC with Boundary Control Using Second-order Switching Surface*
Carl N.M. Ho, Keith T.K. Au and Henry S.H. Chung 1319

P195 *Improved Histeresis Current Control of a Single Phase, three level, Double PFC Converter*
Alberto Lock and Edison Da Silva 1326

P196 *Three-phase Current-Source Buck Type PFC Converter with Reverse-Blocking IGBTs*
Changjin Liu, Dehong Xu and Li Jun 1331

P197 *EMI Study for the Interleaved Multi-Channel PFC*
Chuanyun Wang, Ming Xu, Fred Lee and Lu Bing 1336

P198 *Limitations of the Flyback Power Factor Corrector as a One-Stage Power Supply*
Diego G. Lamar, Arturo Fernandez, Marta M. Hernando, Javier Sebastian and Manuel Arias 1343

P199 *Comparison between Nonlinear-Carrier Control and Average-Current-Mode Control for PFC Converters*
Mohamed Orabi, Reham Haron and Abdelali Elaruodi 1349

Plenary Poster Session: Power Electronics Applications, Room: International Ballroom Center and South

P200 *Design and Implementation of a Voice-Coil Motor Servo Control IC for Auto-Focus Mobile Camera Applications*
Jhih-Da Hsu and Ying-Yu Tzou 1357

P201 *Z-Source B4 Inverters*
Na Duan, Chao Liang, Poh Chiang Loh, Feng Gao and Frede Blaabjerg 1363

P202 *Using Pulse Density Modulation to Improve the Efficiency of IGBT Inverters in Induction Heating Applications*
Vicente Esteve, Jose Jordan, Enrique J. Dede, Cesar Cases and Jose M. Magraner 1370

P203 *The sequential switching shunt maximum power regulator and its application in the electric propulsion system of an spacecraft*
Ausias Garrigos, Jose M. Blanes, Jose A. Carrasco, Alan H. Weinberg and Juan B. Ejea 1374

P204 *Single-Switch Power Supply based on the Class E Amplifier for Ozone Generators*
Mario Ponce-Silva, Jorge Aguilar-Ramirez, Erwin Beutelspacher, Jose M. Calderon and Claudia Cortes1380

P205 *The state-of-the-art hybrid power supply for FED with carbon nanotube*
Dong-Wook Yoo, Jong-Hyun Kim, Myung-Hyo Ryu, Byoung-Kuk Lee and Heung-Gun Kim 1386

P206 *New High Power / High Voltage Battery-Free Bus for Electrical Propulsion in Satellites*
Enrique Maset, Juan B. Ejea, Esteban Sanchis-Kilders, Agustin Ferreres and Jose Jordan 1391

P207 *Issues, Models and Solutions for Triac Modulated Phase Dimming of LED Lamps*
Dustin Rand, Brad Lehman and Anatoly Shteynberg 1398

P208 *Particle Swarm Optimization for energy management fuzzy controller design in dual-source electric vehicle*
Chenghui Zhang, Qingsheng Shi, Naxin Cui, Wuhua Li and Ke Li 1405

P209 *Modeling and calculation of the efficiency for low-cost round-wire planar windings in domestic induction heating applications*
Jesus Acero, Rafael Alonso, Jose Burdio, Luis Barragan and Isidro Urriza 1411

P210 *DBD Modeling as a Function of Waveforms Slope*
Victor H. Olivares, Mario Ponce-Silva, Rene Osorio and Mario A. Juarez 1417

P211 *Comparative Study on a Low Cost Sustaining Driver with Single and Dual Path Energy Recovery Circuits for Plasma Display Panel (PDP)*
Kang Hyun Yi, Seong Wook Choi and Gun Woo Moon 1423

P212 *A Probabilistic Approach of Designing Driving Circuits for Strings of High-Brightness Light Emitting Diodes*
Anindita Bhattacharya, Brad Lehman, Anatoly Shteynberg and Harry Rodriguez 1429

P213 *Experimental investigation on the performance characteristics of white LEDs used in illumination application*
Jian Min Zhou and Wei Yan 1436

P214 *Single-Chip FPGA Implementation of a Digital VRM Controller with Interlaced Sampling and Control Technique*
Yu-Tzung Lin, Yi-Chung Wang and Ying-Yu Tzou 1441

P215 *A Layered Modular Controller Structure for Multilevel Converters*
Wenchao Song, Zhaoning Yang, Yu Liu, Alex Huang and Bin Chen 1448

P216 *Voltage and Current Ripple Considerations for Improving Lifetime of Ultra-Capacitors used for Energy Buffer Applications at Converter Inputs*
Supratim Basu and Tore Undeland 1453

P217 *A High Density Power Converter for Remotely Operated Loads*
Shehab Ahmed, Harsha Patibandla, Prasad Enjeti and Hamid Toliyat 1458

P218 *A New Pulse Battery Charger Topology for Automotive Applications*
Zoran Vrankovic, Adel Nasiri and Abedini Asghar 1465

P219 *A Solid-State Current limiting Switch for Application of Large-scale Space Power Systems*
Masaaki Komatsu, Naotaka Ide and Satoru Yanabu 1471

Plenary Poster Session: Automotive Applications, Room: International Ballroom Center and South

P220 *IGBT Fault Protection Based on di/dt Feedback Control*
Frank Huang and Fred Flett 1478

P221 *Control of the Z-Source Inverter for FCHEV with the Battery Connected to the Motor Neutral Point*
Miaosen Shen, Stefan Hodek and Fang Peng 1485

P222 *An SOI-based High-Voltage, High-Temperature Gate-Driver for SiC FET*
M. Huque, R. Vijayaraghavan, M. Zhang, B. Blalock and L. Tolbert 1491

P223 *Development of Power Conditioning System for a microturbine in vehicle*
Min-Sik Rho, Gi-Rae Kim, Young-Gyu Choi and Mun-suk Chae 1496

P224 *Auxiliary Power Supply for Hybrid Electric Vehicles*
Jin Wang, Chingchi Chen, Steven Chorian and Yi Huang 1502

P225 *Advanced Active Power Filter Controlled permanent-magnet synchronous generator for Automotive Applications*
Katsumi Nishida, Tarek Ahmed and Mutsuo Nakaoka 1508

P226 *Investigation of the Effects of Energy Storage Systems on Electric Drive Train Efficiency of Plug-In Hybrid Electric Vehicles*
Sheldon Williamson 1515

Plenary Poster Session: EMI and Thermal Issues, Room: International Ballroom Center and South

P227 *Reliability-Oriented Assessment of a DC/DC Converter for Photovoltaic Applications*
Hugo Calleja, Freddy Chan and Israel Uribe 1522

P228 *EMI Filters based on Coreless Planar Spiral Windings for Ultrahigh Frequency Power Converters*
Xun Liu, Chi Kwan Lee and S.Y.R. Hui 1528

P229 *Analyzing Current Ripple in Variable-Frequency Boost Converter*
Mikko Kuisma and Pertti Silventoinen 1535

Tuesday, June 19, 8:30AM-10:10AM

DC-DC Converters: VRM Control I, Chair: Dell Inc. Shiguo Luo, Room: Salon I

8:30AM *Modeling and Analysis for Beat-Frequency Current Sharing Issue in Multiphase Voltage Regulators*
Juanjuan Sun, Fred Lee, Ming Xu and Yang Qiu 1542

8:55AM *A Quick Capacitor Charge Balance Control Method to Achieve Optimal Dynamic Response for Buck Converters*
Eric Meyer and Yan-Fei Liu 1549

9:20AM *Optimal Design of Current Source Gate Driver for a Buck Voltage Regulator Based on a New Analytical Loss Model*
Zhiliang Zhang, Wilson Eberle, Zhihua Yang, Yan-Fei Liu and Paresh C. Sen 1556

9:45AM *Dual-Edge Pulse Width Modulation Scheme for Fast Transient Response of Multiple-Phase Voltage Regulators*
Weihong Qiu, Greg Miller and George Liang 1563

DC/AC Inverters: Multilevel Inverters I, Chair: Michigan State University Fang Peng, Room: Salon II

8:30AM *A New Multilevel Inverter - Hexagram Inverter for Medium Voltage Adjustable Speed Drive Systems. Part II. Three-phase Motor Drive*
Jun Wen and Keyue Smedley 1571

8:55AM *Topological Design and Modulation Strategy for Buck-Boost Three-Level Inverters*
Feng Gao, Remus Teodorescu, Frede Blaabjerg, Poh Chiang Loh and D Mahinda Vilathgamuwa 1578

9:20AM *A Four-Level Converter with Optimized Switching Patterns for High-Speed Electric Drives*
Haiqing Weng, Kunlun Chen, Jianmei Zhang, Rajib Datta and Xianghui Huang 1585

9:45AM *A Hybrid Multilevel Converter System with Extended Adjustable Voltage Range*
Shoji Fukuda and Takatsugu Yoshida 1592

Integration, Packaging and Modules I, Chair: Delft University of Technology Braham Ferreira, Room: Salon III

8:30AM *On-Chip Bondwire Inductor with Ferrite-Epoxy Coating: A Cost-Effective Approach to Realize Power Systems on Chip*
John Shen, Jian Lu, Xu Cheng, Xun Gong and Hongwei Jia 1599

8:55AM *Shielded LTCC inductor as substrate for power converter*
Michele Lim, Yan Dong, Jacobus Daniel van Wyk, Fred Lee and Khai Ngo 1605

9:20AM *Design and Fabrication of Integrated Power Inductor Based on Silicon Molding Technology*
Mingliang Wang, Issa Batarseh, Khai Ngo and Huikai Xie 1612

9:45AM *Analysis and Suppression of Inductive Interference in Active Integrated Power Electronics Module*
Chen Qiaoliang, Yang Xu, Wang Zhaoan and Zhang Lianghua 1619

Motor Drives: PM Motors I, Chair: University of Michigan-Dearborn Chris Mi, Room: Salon VI

8:30AM *Efficiency-Optimized Flux-Weakening Control of PMSM Incorporating Speed Regulation*
Song Chi, Longya Xu and Zheng Zhang 1627

8:55AM *A Novel Direct Torque Control Method of PM Synchronous Motors*
Adel Nasiri 1634

9:20AM *Optimum Control of a Five-phase Integrated Modular Permanent Magnet Motor Under Normal and Open-Circuit Fault Conditions*
Suman Dwari, Leila Parsa and Thomas Lipo 1639

9:45AM *Comparison of Proportional+Integral Control and Variable Structure Control of Interior Permanent Magnet Synchronous Motor Drives*
Saad Sayeef and M. F. Rahman 1645

Digital Control Techniques II, Chair: University of Colorado Dragan Maksimovic, Room: Salon VII

8:30AM *Increased Transient Performance of Dc-Dc Converters Via Augmentation and Geometric Control*
Grant Pitel and Philip Krein 1652

8:55AM *Digital Implementation of Boundary Control with Second-order Switching Surface for Inverters*
Keith T.K. Au, Carl N.M. Ho, Henry S.H. Chung, W.H. Lau and W.T. Yan 1658

9:20AM *Construction of Autonomous Decentralized Control UPS system with HW/SW Codesign using FPGA based Hardware Controller*
Tsuyoshi Saito, Nobuaki Doi, Fujii Wataru and Yokoyama Tomoki 1665

9:45AM *Sensorless Digital Peak Current Controller for Low-Power DC-DC SMPS Based on a Bi-Directional Delay Line*
Olivier Trescases, Amir Parayandeh, Aleksandar Prodic and Wai Tung Ng 1670

Alternative and Renewable Energy II, Chair: Universidade Federal de Santa Catarina Edison Mineiro, Room: Salon VIII

8:30AM *Single Sensor MPPT Algorithm for Multiple Solar Panels Configurations*
Florent Boico and Brad Lehman 1678

8:55AM *A New Single-Stage Current Source Inverter for Photovoltaic and Fuel Cell Applications using Reverse Blocking IGBTs*
Christian Klumpner 1683

9:20AM *Digital Ripple Correlation Control for Photovoltaic Applications*
Jonathan Kimball and Philip Krein 1690

9:45AM *Boost Converter with a Reconfigurable Inductor for Photovoltaic Power Processing*
Nicholas Benavides and Patrick Chapman 1695

Tuesday, June 19, 10:30AM-12:10PM

DC-DC Converters : Isolated Converters, Chair: Intel Annabelle Pratt, Room: Salon I

10:30AM *Tri-modal Half-Bridge Converter for Three-Port Interface*
Hussam Al-Atrash, Justin Reese and Issa Batarseh 1702

10:55AM *Performance Analysis of an Isolated ZVT Boost Converter with Primary-Parallel-Secondary-Series (PPSS) Structure*
Wuhua Li, Jianjiang Shi, Jun Liu, Jiande Wu and Xiangning He 1709

11:20AM *New Cost-Effective SIngle Switch Isolated Converter*
Ki-Bum Park, Chong-Eun Kim, Gun-Woo Moon and Myung-Joong Youn 1715

11:45AM *Key Issues of Clamping Diodes in DCM Phase-Shift Full-Bridge Converter*
Lanlan Yin, Qianhong Chen, Bo Peng, Jian Wang and Xinbo Ruan 1721

DC-AC Inverters: Control and Analysis, Chair: Vanner Technology Alexander Isurin, Room: Salon II

10:30AM *Distributed Parallel Operation of Modified Deadbeat Controlled UPS Inverters*
Meng Wang, Fangzheng Li, Yadong Liu and LiPei Huang 1727

10:55AM *Generalized Theory of Boundary Control for Single-phase Multilevel Inverter using Second-order Switching Surface*
Ka Wai Paul Chan, Shu Hung Henry Chung and Shu Yuen Ron Hui 1733

11:20AM *Common-Mode Ripple-Current Estimator for Parallel Three-Phase Inverters*
Tsung-Po Chen 1740

11:45AM *A Generalized Control Strategy of Per-Phase DC Voltage Balancing for Cascaded Multilevel Converter-based STATCOM*
Chong Han, Alex Huang, Yu Liu and Bin Chen 1746

Passive Components I, Chair: University of Illinois-Urbana-Champaign Patrick Chapman and Dartmouth College Charles Sullivan, Room: Salon III

10:30AM *Design and Fabrication of Low-Loss Toroidal Air-Core Inductors*
Charles R. Sullivan, Satish Prabhakaran, Weidong Li and Shanshan Lu 1754

10:55AM *Design Algorithm for High-Current Gapped Foil-Wound Inductors in Low-to-Medium Frequency DC-DC Converters*
Brendan Lyons, John Hayes and Michael Egan 1760

11:20AM *Core Materials for High Frequency VRM Inductors*
Sean Kelly, Christina Collins, Maeve Duffy, Fernando Rhen and Saibal Roy 1767

11:45AM *30-MHz Power Inductor Using Nano-Granular Magnetic Material*
Shanshan Lu, Yuqin Sun, Marissa Goldbeck, Donald R. Zimmanck and Charles R. Sullivan 1773

Motor Drives: SR Motors, Chair: Georgia Institute of Technology Ron Harley, Room: Salon VI

10:30AM *A New Random Switching Technique for the Single Phase Switched Reluctance Motor Drives*
Minh Khai Nguyen, Duck-Shick Shin, Young-Gook Jung and Young-Cheol Lim 1778

10:55AM *Instantaneous Torque Control of SRM with a Modified Torque Sharing Method*
Dong-Hee Lee, Zhen-Guo Lee and Jin-Woo Ahn 1784

11:20AM *A Modified Multi-Level Converter for Low Cost High Speed SR Drive*
Huijun Wang, Dong-Hee Lee and Jin-Woo Ahn 1790

11:45AM *Adaptive Iterative Learning Control of Switched Reluctance Motors for Minimum Energy Conversion Loss and Torque Ripple*
Shun-Chung Wang, Yi-Hua Liu, Shun-Jih Wang, Yih-Chien Chen and Shou-Zhuang Lin 1796

Modeling, Analysis and Simulation I, Chair: University of Illinois-Chicago Sudip Mazumder, Room: Salon VII

10:30AM *Modeling and Controller Design of the Z-Source Inverter with inductive Load*
Miaosen Shen, Qingsong Tang and Fang Peng 1804

10:55AM *Analytical Modelling of Voltage Balance Dynamics for a Flying Capacitor Multilevel Converter*
Brendan McGrath and Grahame Holmes 1810

11:20AM *A new perspective in power converters modeling: complementarity systems*
Francesco Vasca, Luigi Iannelli and Kanat Camlibel 1817

11:45AM *A Quantitative Analysis and Comparison of In-phase Control and Energy-Optimized Control for Series Power Quality Controllers*
Xinming Huang, Jinjun Liu and Hui Zhang 1824

Alternative and Renewable Energy III, Chair: Whirlpool Company Song Chi, Room: Salon VIII

10:30AM *Power Quality and Dynamic Performance Improvement of Wind Farms Using a STATCOM*
Wei Qiao and Ronald Harley 1832

10:55AM *Evaluation of Voltage Sag Ride-Through of a Doubly Fed Induction Generator Wind Turbine with Series Grid Side Converter*
Patrick Flannery and Giri Venkataramanan 1839

11:20AM *An Instantaneous Current Control Strategy and Its Digital Implementation for PWM Converter in Variable-Speed WECS*
Ning Zhu, Hui Liang and Jiuchun Jiang 1846

11:45AM *A Novel Control System for Current Source Converter Based Variable Speed PM Wind Power Generators*
Jingya Dai, Dewei Xu and Bin Wu 1852

Tuesday, June 19, 1:30PM-3:10PM

DC-DC Converters : Topology I, Chair: Linear Technology Johan Strydom, Room: Salon I

1:30PM *Unipolar Bidirectional Current Source (UBiCS) Converter*
Dirk Hirschmann, Daniel van Treek, Klaus Rigbers and Rik De Doncker 1859

1:55PM *A Novel Three-Phase Buck Converter with Bootstrap Driver Circuit*
Abe Kosuke, Nishijima Kimihiro, Harada Kosuke, Nakano Tadao and Nabeshima Takashi 1864

2:20PM *High Power Density Voltage Divider and Its Application in Two-Stage Server VR*
Julu Sun, Ming Xu, Fred Lee and Yucheng Ying 1872

2:45PM *A Family of Four-Quadrant PWM DC-DC Converters*
Yefim Berkovich, Boris Axelrod, Sam Tapuhi and Adrian Ioinovici 1878

DC-AC Inverters: PWM Control, Chair: Monash University Grahame Holmes, Room: Salon II

1:30PM *Non-Symmetrical Selective Harmonic Elimination PWM Techniques: The Unipolar Waveform*
Mohamed Dahidah and Vassilios Agelidis 1885

1:55PM *Extension of the Nearest-Three Virtual-Space-Vector PWM to the Four-Level Diode-Clamped dc-ac Converter*
Sergio Busquets-Monge, Josep Bordonau and Joan Rocabert 1892

2:20PM *A Novel Carrier-based PWM Method for 3-Level NPC Inverter Utilizing Control Freedom Degree*
Jun Li, Qin Huang, Zhaoming Qian and Huijie Zhao 1899

2:45PM *Modulation Schemes of Multi-phase Three-Level Z-Source Inverters*
Feng Gao, Poh Chiang Loh, Frede Blaabjerg and Remus Teodorescu 1905

Power Semiconductor Devices II, Chair: Vishay Michael Choi and National Semiconductor David Anderson, Room: Salon III

1:30PM *Gate Voltage Pattern Analyzer for Short-Circuit Protection in IGBT Inverters*
JunBae Lee and DongSeok Hyun 1913

1:55PM *Improving the Emitter Turn-Off Thyristor for Parallel Operation*
Bin Chen, Xigen Zhou and Alex Huang 1918

2:20PM *Failure mechanisms of Trench IGBT under various short-circuit conditions*
Adel Benmansour, Stephane Azzopardi, Jean-Christophe Martin and Eric Woirgard 1923

2:45PM *Physics-based Model for Emitter Turn-Off Thyristor (ETO)*
Bin Chen, Xigen Zhou and Alex Huang 1930

Motor Drives: Diagnostics and Control I, Chair: Georgia Institute of Technology Tom Habtler, Room: Salon VI

1:30PM *On the short-circuiting fault detection in a PMSM by means of stator current transformations*
Javier Alveiro Rosero, Luis Romeral, Jordi Cusido, Antoni Garcia and Juan Antonio Ortega 1936

1:55PM *Fault Tolerant Operations in Adjustable-Speed Drives and Soft Starters for Induction Motors*
Chia-Chou Yeh and Nabeel Demerdash 1942

2:20PM *Identification of AC-Machines with LC-Filters by Utilising the Non-Parametric Models*
Piotr Szczupak and Mario Pacas 1950

2:45PM *Comparison of different types of neural networks and autonomous online learning methods for self commissioning of speed sensorless controlled induction machines*
T.M. Wolbank, M.A. Vogelsberger, R. Stumberger, S. Mohagheghi and T.G. Habetler 1955

Modeling, Analysis and Simulation II, Chair: University of South Carolina Antonello Monti, Room: Salon VII

1:30PM *Modelling of Single Stage Three Level Resonant AC/DC Converters Operating with Variable Frequency Phase Shift Modulation*
Mohammed Agamy and Praveen Jain 1962

1:55PM *Black-Box Terminal Characterization Models for the Analysis and Simulation of Distributed Power Systems*
Luis Arnedo, Dushan Boroyevich, Rolando Burgos and Fred Wang 1968

2:20PM *Advantages of The Symmetric-On Time Modulator In Multiple-sampled Digitally Controlled DC-DC Converters*
Luca Corradini, Elisabetta Tedeschi and Paolo Mattavelli 1974

2:45PM *Input Impedance Modeling and Analysis of Line-Commutated Rectifiers*
Zhonghui Bing, Kamiar Karimi and Jian Sun 1981

Automotive Applications, Chair: Illinois Institute of Technology Ali Emadi and Oak Ridge National Lab Laura Marlino, Room: Salon VIII

1:30PM *A Reduced-Part, Triple-Voltage DC-DC Converter for Electric Vehicle Power Management*
Gui-Jia Su, Joseph Cunningham and Lixin Tang 1989

1:55PM *A Reconfigurable and Flexible Experimental Footprint for Control Validation in Power Electronics and Power Systems Research*
Lewei Qian, Li Liu and David Cartes 1995

2:20PM *High-Performance Control of Two Three Phase Permanent Magnet Synchronous Machines in an Integrated Inverter For Automotive Applications*
Lixin Tang and Gui-jia Su 2001

2:45PM *Multi-Level DC/DC Power Conversion System with Multiple DC Sources*
Miaosen Shen, Fang Peng and Leon Tolbert 2008

Tuesday, June 19, 3:30PM-5:10PM

DC-DC Converters : VRM Control II, Chair: Virginia Tech Dushan Boroyevich and Intel Lilly Huang, Room: Salon I

3:30PM *Dynamic PWM Ramp Signal to Improve Load Transient in DCM and Mode Hoping Operation*
Osama Abdel-Rahman and Issa Batarseh 2016

3:55PM *Native AVP Control Method for Constant Output Impedance of DC Power Converters*
Jian Rong Huang, Sophia Chien-Hui Wang, Chia Jung Lee, Eddie Kuo-Lung Tseng and Dan Chen 2023

4:20PM *Sensorless Current Sharing Analysis and Scheme for Multiphase Converters*
Jaber Abu Qahouq, Lilly Huang and Doug Huard 2029

4:45PM *Load dependent Dead Time Controller Based on Minimized Duty cycle technique in DC-DC Buck Converters*
Ke-Horng Chen, Hong-Wei Huang, Chun-Yu Hsieh and Sy-Yen Kuo 2037

DC-AC Inverters: Space Vector Modulation, Chair: National Technical University of Athens Manias Stefanos and Zhejiang University Zhaoming Qian, Room: Salon II

3:30PM *A Space Vector Modulation Approach for a Back-to-Back Connected Four-Level Converter*
Maryam Saeedifard, Reza Iravani and Josep Pou 2043

3:55PM *A Generalized Space Vector Classification Technique for Six-Phase Inverters*
Davood Yazdani, Sayed Ali Khajehoddin, Alireza Bakhshai and Geza Joos 2050

4:20PM *A Generalized Three-phase Multilevel Current Source Inverter with Carrier Phase-Shifted SPWM*
Zhihong Bai, Zhongchao Zhang and Yao Zhang 2055

4:45PM *Optimal Predictive Control of Three-Phase NPC Multilevel Inverter: Comparison to Robust Sliding Mode Controller*
J. Dionisio Barros and J. Fernando Silva 2061

Passive Components II, Chair: Virginia Tech Jason Lai, Room: Salon III

3:30PM *Eddy Current Modeling with Order Reduction in Dynamic Magnetic Equivalent Circuits*
Ali Davoudi and Patrick L. Chapman 2069

3:55PM *Superconducting Inductors for Ultra-High Frequency Power Conversion*
Waseem Roshen 2075

4:20PM *Extraction of Dynamic, Low-Order Models for Magnetic Devices Based on Finite Element Analysis with Hysteresis*
Liyan Qu and Patrick Chapman 2082

4:45PM *Design and Testing of a Power-Electronic-Based Synthetic Inductor*
Cheng Luo, Matthew Whitehead and Heath Hofmann 2089

Motor Drives: Induction Motors II, Chair: Delphi Tomy Sebastian, Room: Salon VI

3:30PM *Control of a Novel Dual Stator-Winding Induction Generator for wide speed-range operation*
Yong Li, Yuwen Hu and Lingshun Liu 2096

3:55PM *Parameter-Insensitive Sensorless Decoupled P-Q Controller For Doubly-Fed Induction Machine*
Baike Shen and Boon-Teck Ooi 2102

4:20PM *A Study on an Optimal Torque for Power Regeneration of an Induction Motor*
Kaoru Inoue, Kenji Ogata and Toshiji Kato 2108

4:45PM *A Non-Standard Robust Adaptive Stator Current Control Strategy for Induction Motor Drives*
R.L.A Ribeiro, C.B. Jacobina, A.D. Araujo, M.B. Santos and A.C. Oliveira 2113

Modeling, Analysis and Simulation III, Chair: Motorola Mikkel Hoyerby, Room: Salon VII

3:30PM *Wave Analysis of Multilayer Absorptive Low-Pass Interconnects*
Kylie De Jager, Luca Dalessandro, Ivan Hofsajer and Willem Odendaal 2121

3:55PM *Modeling, Analysis and Simulation of "AC Inductor" Based Converters*
Ilya Zeltser and Sam Ben-Yaakov 2128

4:20PM *Computer-Aided Average-Value Modeling of Peak Current-Mode Controlled Dc-Dc Converters Considering Parasitics*
Ali Davoudi, Juri Jatskevich and Patrick L. Chapman 2135

4:45PM *Thermal impedance extraction method for power MOSFETs*
Toni Lopez and Reinhold Elferich 2140

Aerospace Applications, Chair: Sandia National Labs Brandon Witcher and NASA Chris Iannello, Room: Salon VIII

3:30PM *A 100 kHz SiC Sparse Matrix Converter*
Thomas Friedli, Simon Round and Johann Kolar 2148

3:55PM *Analysis and Design of a Novel Three-Level LLCC Inverter Supplying an Airborne Piezoelectric Brake Actuator*
Rongyuan Li, Norbert Froehleke and Joachim Boecker 2155

4:20PM *Three-Phase Ac Buck Rectifier using Normally-On SiC JFETs at 150 kHz Switching Frequency*
Callaway Cass, Rolando Burgos, Fred Wang and Dushan Boroyevich 2162

4:45PM *Large-Signal Stability Assessment of AC/DC Systems with Multi-Pulse Rectification and DC-Fed PWM Motor Drives*
Sebastian Rosado, Rolando Burgos, Fred Wang and Dushan Boroyevich 2168

Tuesday, June 19, 5:30PM-7:00PM

Panel Session: Digital power supplies - Trend or fad?, Chair: Milan Jovanovic, Room: Salon I

Panel Session: State of the art servo drives fulfill >95% of current industrial needs. Is this, Chair: Ralph Kennel, Room: Salon II

Panel Session: In today's globally competitive environment, how can academia provide more value, Chair: Rik DeDoncker, Room: Salon VI

Panel Session: , Room: Salon VII

Wednesday, June 20, 8:30AM-10:10AM

DC-DC Converters: Buck Converters, Chair: J.C. Balda ..... University of Arkansas and Fairchild Semiconductor Alan Elbanhawy, Room: Salon I

8:30AM *Comparative Study of Lateral and Trench Power MOSFETs in Multi-MHz Buck Converter Applications*
Yali Xiong, Xu Cheng, David Okada and John Shen 2175

8:55AM *Design Considerations for Small Signal Modeling of DC-DC Converters Using Inductor DCR Current Sensing Under Time Constants Mismatch Conditions*
Lei Hua and Shiguo Luo 2182

9:20AM *Critical Parameters in the Transient Response of Synchronous Buck Converters*
Martin Ordonez, John Quaicoe and Tariq Iqbal 2189

9:45AM *Robust Relay-Feedback Based Autotuning For DC-DC Converters*
Luca Corradini, Paolo Mattavelli and Dragan Maksimovic 2196

DC-AC Inverters: Special Techniques, Chair: Ryerson University Bin Wu, Room: Salon II

8:30AM *A Voltage Balancing Method and its Stability Boundary for Five-Level Diode-Clamped Multilevel Converters*
Sayed Ali Khajehoddin, Alireza Bakhshai and Praveen Jain 2204

8:55AM *Commutation in a High Power IGBT Based Current Source Inverter*
Muhammad Abu-Khaizaran and Patrick Palmer 2209

9:20AM *An Analysis on the Influence of Input Filters to SVG systems and Corresponding Design Considerations*
Guopeng Zhao, Jinjun Liu, Kuang Li and Zhaoan Wang 2216

9:45AM *New Single Sustaining Driver for AC-PDP employing Voltage Stress Reduction Technique*
Ki-Bum Park, Chong-Eun Kim, Gun-Woo Moon and Myung-Joong Youn 2223

Integration, Packaging and Modules II, Chair: Virginia Tech Khai Ngo, Room: Salon III

8:30AM *Pressure Contact Packaging for Hybrid Electric Vehical Drive*
Lianghua Zhang, Xu Yang, Fei Wang and Zhaoan Wang 2228

8:55AM *Survey on High-Temperature Packaging Materials for SiC-Based Power Electronics Modules*
Luisa Coppola, Daniel Huff, Fei Wang, Rolando Burgos and Dushan Boroyevich 2234

9:20AM *Compact Inverter Designed for High Temperature Operation*
Cyril Buttay, Jeremy Rashid, C. Mark Johnson, Florin Udrea and Gehan Amaratunga 2241

9:45AM *Modelling and Simulation Techniques for Multilayer Integrated Passive Structures in the Time Domain*
Cornelia Oberholzer and Ivan Hofsajer 2248

Motor Drives: PM Motors II, Chair: Ford Motor Company Allen Gale, Room: Salon VI

8:30AM *Novel Scheme of Driving Single Phase PM AC Motor in Uni-Direction*
John Kim 2255

8:55AM *A High Performance Permanent Magnet Synchronous Motor Drive by using a Robust Adaptive Control Strategy*
R.L.A. Ribeiro, A.D. Araujo, A.C. Oliveira and C.B. Jacobina 2260

9:20AM *Effect of Side Permanent Magnets for Reluctance Interior Permanent Magnet Machines*
John Hsu, Seong-T Lee, Randy Wiles, Chester Coomer and Kirk Lowe 2267

9:45AM *Online Particle Swarm Optimization Design of Speed Controller considering Anti-windup for PMSM Drive System*
Shuai Yan, Dianguo Xu, Xianguo Gui, Ming Yang and Bingbing Li 2273

Modeling, Analysis and Simulation IV, Chair: Queen's University Praveen Jain, Room: Salon VII

8:30AM *Iterative Behavioral Modeling of Charge-Pump Based Electronic Ballast - Fluorescent Lamp System*
P.W. Tam, H.S.H. Chung and S.Y.R. Hui 2279

8:55AM *Dynamic Behavior Verification of Potential Concepts for Mobile Generator Sets*
Jan Leuchter, Vladimir Rerucha, Pavol Bauer and Zdenek Krupka 2287

9:20AM *A generalized instantaneous method for harmonics, positive and negative sequence detection/extraction*
Rodrigo Cutri and Lourenco Matakas Jr. 2294

9:45AM *High-Order Switching Surface for Boundary Control of Inverters*
Julian Y. C. Chiu, Kelvin K. S. Leung and Henry S. H. Chung 2298

Alternative and Renewable Energy IV, Chair: Tennessee Tech. University Joseph Ojo, Room: Salon VIII

8:30AM *Online grid impedance estimation for single-phase grid-connected systems using PQ variations*
Mihai Ciobotaru, Remus Teodorescu, Pedro Rodriguez, Timbus Adrian and Frede Blaabjerg 2306

8:55AM *Boost-Integrated Phase-Shift Full-Bridge Converters for Three-Port Interface*
Hussam Al-Atrash and Issa Batarseh 2313

9:20AM *Control of Neutral-Point-Clamped Converter in Distributed Power Generation to fulfil Low Voltage Ride-Through Requirements*
Salvador Alepuz, Sergio Busquets, Josep Bordonau, Jorge Pontt and Cesar Silva 2322

9:45AM *Grid Interconnected Z-Source PV Inverter*
Richard Badin, Yi Huang, Fang Peng and Heung-Geun Kim 2328

Wednesday, June 20, 10:30AM-12:10PM

DC-DC Converters : Topology II, Chair: Arizona State University Rajapandian Ayyanar, Room: Salon I

10:30AM *A Family of Interleaved DC/DC Converters Deduced from a Basic Cell with Winding-Coupled Inductors for High Step-Up/Step-Down Conversions*
Wuhua Li, Jiande Wu, Dong Wang, Yan Deng and Xiangning He 2335

10:55AM *A Novel Turn-On/Off Snubber for Interleaved Boost Converters*
Tseng S. -Y., Shiang J. -Z., Chang H. H., Jwo W. -S. and Hsieh C. -T. 2341

11:20AM *Voltage Doubler/Tripler Current-Mode Charge Pump Topology with simple "Gear Box"*
Gerhard Thiele and Erich Bayer 2348

11:45AM *Voltage Scalable Switched Capacitor DC-DC Converter for Ultra-Low-Power On-Chip Applications*
Yogesh Ramadass and Anantha Chandrakasan 2353

DC-AC Inverters: Multi Level Inverters II, Chair: ABB Srinivas Ponnaluri, Room: Salon II

10:30AM *Modulation Extension Control of Hybrid Cascaded H-bridge Multilevel Converters with 7-level Fundamental Frequency Switching Scheme*
Zhong Du, Burak Ozpineci and Leon Tolbert 2361

10:55AM *Capacitor Voltage Balancing Schemes in Flying Capacitor Multilevel Inverters*
Anshuman Shukla, Arindam Ghosh and Avinash Joshi 2367

11:20AM *Level-shifted PWM for Cascaded Multilevel Inverters with Even Power Distribution*
Mauricio Angulo, Pablo Lezana, Samir Kouro, Jose Rodriguez and Bin Wu 2373

11:45AM *Current Control of a Voltage Source Inverter connected to the Grid via an LCL Filter*
Anthony Papavasiliou, Stavros Papathanassiou, Stefanos Manias and Georgios Demetriadis 2379

Synchronous Rectifier Converters, Chair: UPM Jose Cobos, Room: Salon III

10:30AM *Twisted Core Coupled Inductors for Microprocessor Voltage Regulators*
Yan Dong, Fred C. Lee, Jinghai Zhou, Shuo Wang and Ming Xu 2386

10:55AM *Non-isolated Half Bridge Buck Based Converter for VRM application*
Majd Batarseh, Xiangcheng Wang and Issa Batarseh 2393

11:20AM *Mixed Signal Synchronous Rectification Scheme for Current-Type Resonant Converters*
Darryl Tschirhart and Praveen Jain 2399

11:45AM *1MHz High Efficiency LLC Resonant Converters with Synchronous Rectifier*
Dianbo Fu, Bing Lu and Fred C. Lee 2404

Motor Drives: Induction Motors III, Chair: University of Akron Malik Elbuluk, Room: Salon VI

10:30AM *Using Mechanical Vibration to Estimate Rotor Speed in Induction Motor Drives*
Dezheng Wu and Steve Pekarek 2412

10:55AM *Improved Design for Driving Characteristics in Single Phase Induction Motor with Concentrated Winding*
Tae-Uk Jung, Cheol-Ho Yun, Hyun-Rok Cha, Myung-Gi Chae and Hyung-Mo Kim 2418

11:20AM *Robust Sensorless Control for Induction Motor Drives Fed by a Matrix Converter with Variable Structure - Model Reference Adaptive Control*
Won-Sang Kim, Kyo-Beum Lee, Sunghoi Huh and Frede Blaabjerg 2423

11:45AM *MRAS Speed Estimation and Full-Order Flux Observer for Dual Stator Winding Induction Motor Drives*
Olorunfemi Ojo, Zhiqiao Wu and Gan Dong 2428

Power Quality and Utility Applications I, Chair: North Carolina State University Subhashish Bhattacharya, Room: Salon VII

10:30AM *On Control of Static Synchronous Series Compensator for SSR Mitigation*
Massimo Bongiorno, Jan Svensson and Lennart Angquist 2436

10:55AM *Modeling and Control of the Static Synchronous Series Compensator under Different Operating Modes*
Fernando Mancilla-David and Giri Venkataramanan 2443

11:20AM *Magnetic Saturation in Transformers used for a 48-pulse Voltage-Source Converter based STATCOM under Line to Line System Faults*
Zhengping Xi and Subhashish Bhattacharya 2450

11:45AM *A Z-source inverter based flexible DG system with P+resonance and repetitive controllers for power quality improvement of a weak grid*
Chandana Jayampathi Gajanayake, Don Mahinda Vilathgamuwa, Poh Chiang Loh, Frede Blaabjerg and Remus Teodorescu 2457

Alternative and Renewable Energy V, Chair: Norwegian University of Science Tore Undeland and Technology, Room: Salon VIII

10:30AM *Improved Performance and Control of Hybrid Cascaded H-bridge Inverter for Utility Interactive Renewable Energy Applications*
Hui Li, Kaiyu Wang, Da Zhang and Wei Ren 2465

10:55AM *Stability Improvement of Micro-grids with Coordinate Control of Fuel Cell and Ultracapacitor*
Jun Liang and Chunmei Feng 2472

11:20AM *Complex-Space Recursive Least Squares Power System Identification*
Santiago Cobreces, Pedro Rodriguez, Daniel Pizarro, Francisco J. Rodriguez and Emilio J. Bueno 2478

11:45AM *A Novel Three-phase High power Current-fed DC/DC Converter with Active clamp for Fuel cells*
Hanju Cha and Prasad Enjeti 2485

Wednesday, June 20, 1:30PM-3:10PM

DC-DC Converters: Control I, Chair: Queen's University Yanfei Liu, Room: Salon I

1:30PM *Feedback for Low Frequency Ripple Attenuation in DC Transformer*
Annabelle Pratt and Sen Dou 2491

1:55PM *Experimental Apparatus for Testing the DC/DC Converter Dynamics*
Federico Belloni, Piero G. Maranesi and Marco Riva 2498

2:20PM *Explicit Hybrid Model Predictive Control of the dc-dc Boost Converter*
Giovanni Beccuti, Georgios Papafotiou, Roberto Frasca and Manfred Morari 2503

2:45PM *A Monolithic CMOS 5V/1V Switched Capacitor DC-DC Step-down Converter*
Andrabadu Viraj and Gehan Amaratunga 2510

Matrix Converters, Chair: Impact Technologies Antonio Ginart, Room: Salon II

1:30PM *A Current Source Matrix Converter for High-Power Applications*
Hassan Nikkhajoei 2516

1:55PM *Illustration of Relation between Load and Supply Current Distortions in Direct and Indirect Matrix Converters*
Matti Jussila and Heikki Tuusa 2522

2:20PM *Avoiding Regeneration with a Matrix Converter Drive*
Imayavaramban Munuswamy and Wheeler Patrick 2529

2:45PM *Application of Matrix Converter for Large Induction Machines*
Hassan Nikkhajoei and Reza Iravani 2535

Soft Switching and Resonant Converters I, Chair: Georgia Institute of Technology Deepak Divan, Room: Salon III

1:30PM *A ZCS Isolated Full-Bridge Boost Converter with Multiple Inputs*
Andrew S. W. Leung, Henry S. H. Chung and Tony Chan 2542

1:55PM *Gain-adjustment Technique for Resonant Power Converters with Piezoelectric Transformer*
Joung-hu Park, Sungjin Choi, Sangmin Lee and Bo H. Cho 2549

2:20PM *Double Ended ZVS Half-Bridge Zeta Converter*
Ki-Bum Park, Chong-Eun Kim, Gun-Woo Moon and Myung-Joong Youn 2554

2:45PM *A Novel Dual-LLC Resonant Soft Switching Converter for Super High Frequency Induction Heating Power Supplies*
Zhengshi Wang, Zhenli Lou and Huiming Chen 2561

Motor Drives: PM Motors III, Chair: Technology University of Delft Sjoerd de Haan, Room: Salon VI

1:30PM *Analysis of Cogging Torque and its Effect on Direct Torque Control (DTC) in a Segmented Interior Permanent Magnet Machine*
Rukmi Dutta, Saad Sayeef and M. F Rahman 2568

1:55PM *Research on a Novel Speed Closed Loop Control Technique of Brushless DC Motor*
Qingbo Hu, Zhengyu Lu and Zhaoming Qian 2575

2:20PM *A Novel Sliding Mode Observer with Adaptive Feedback Gain for PMSM Sensorless Vector Control*
Song Chi, Zheng Zhang and Longya Xu 2579

2:45PM *Comparative Study of an Adaptive Sliding Observer and an EKF for Speed Sensor-less DTC IPM Synchronous Motor Drives*
Zhuang Xu, Fazlur Rahman and Dianguo Xu 2586

Power Quality and Utility Applications II, Chair: Xian Jiaotong University Jinjun Liu, Room: Salon VII

1:30PM *A New Three Phase Hybrid Passive Filter to Damp Resonances and Compensate Harmonics and Reactive Power for Any Type of Load under Distorted Source Conditions*
Abdelhamid Hamadi, Salem Rahmani and Kamal Al-Haddad 2594

1:55PM *Soft Phase Locked Loop for Active Power Filter Applied in Small Rating Stand-Alone Power System*
Longhui Wu, Fang Zhuo and Zhaoan Wang 2600

2:20PM *A Stochastic Simulation of Battery Sizing for Demand Shifting and Uninterruptible Power Supply Facility*
Chee Wei Tan, Tim C. Green and Carlos A. Hernandez-Aramburo 2607

2:45PM *Analysis of Power Quality (PQ) Signals by Continuous Wavelet Transform*
Malabika Basu and Biswajit Basu 2614

Alternative and Renewable Energy VI, Chair: National University of Ireland Galway Gerard Hurley, Room: Salon VIII

1:30PM *Analysis of DC-DC Conversion for Energy Harvesting Systems Using a Mixed-Signal Sliding-Mode Controller*
Nathaniel Guilar, Rajeevan Amirtharajah and Paul Hurst 2620

1:55PM *A Systematic Approach to Synthesizing Multi-Input DC/DC Converters*
Yuan-Chuan Liu and Yaow-Ming Chen 2626

2:20PM *A Modular Fuel Cell, Modular DC-DC Converter Concept for High Performance and Enhanced Reliability*
Leonardo Palma and Enjeti Prasad 2633

2:45PM *High Speed Turbine - Induction Generator System for Utilization of Renewable and Waste Energies*
Rafael Jardan and Istvan Nagy 2639

Wednesday, June 20, 3:30PM-5:10PM

DC-DC Converters : Control II, Chair: Intronics Power Arthur Pfaelzer, Room: Salon I

3:30PM *Optimizing the Transient Behavior and Frequency Response of Constant Frequency One Cycle Control: The Charge Control Modulator*
Victor Anunciada, Beatriz Borges and Hugo Marques 2647

3:55PM *Current-Mode Control for a Quadratic Boost Converter with a Single Switch*
Ma. Guadalupe Ortiz-Lopez, Jesus Leyva-Ramos, Luis Humberto Diaz-Saldierna, Juan Manuel Garcia-Ibarra and Enrique Eduardo Carbajal-Gutierrez 2652

4:20PM *A Novel Current Sharing Technique for Interleaved Boost Converter*
Byung Sun Min, Nam Ju Park and Dong Seok Hyun 2658

4:45PM *Hysteresis-based mixed-signal voltage-mode control for dc-dc converters*
Daniele Trevisan, Stefano Saggini and Paolo Mattavelli 2664

Other AC-AC Converters, Chair: ETH Zurich Simon Round, Room: Salon II

3:30PM *Z-Source AC-AC Converters Solving Commutation Problem*
Yu Tang, Chaohua Zhang and Shaojun Xie 2672

3:55PM *Voltage Synthesis Using Dual Virtual Quadrature Sources- A New Concept in AC Power Conversion*
Deepak Divan and Jyoti Sastry 2678

4:20PM *A Novel Three-phase Three-leg AC/AC Converter Using Nine IGBTs*
Congwei Liu, Bin Wu, Navid Zargari and David Xu 2685

4:45PM *Three-Level AC-DC-AC Z-Source Converter Using Reduced Passive Component Count*
Poh Chiang Loh, Feng Gao, Pee Chin Tan and Frede Blaabjerg 2691

Soft Switching and Resonant Converters II, Chair: MIT Juan Rivas, Room: Salon III

3:30PM *A New Full Bridge Three Level Resonant Single Stage AC/DC Converter*
Mohammed Agamy and Praveen Jain 2699

3:55PM *A hig-frequency resonant inverter topology with low voltage stress*
Juan Rivas, Yehui Han, Olivia Leitermann, Anthony Sagneri and David Perreault 2705

4:20PM *Very High Frequency Resonant Boost Converters*
Robert Pilawa-Podgurski, Anthony Sagneri, Juan Rivas, David Anderson and David Perreault 2718

4:45PM *A Novel Family of PWM Converters Based on Improved ZCS Switch Cell*
Ling Qin, Shaojun Xie and Hui Zhou 2725

Motor Drives: Diagnostics and Control II, Chair: Eaton Corporation Bin Lu and Rolls-Royce Timothy Alt, Room: Salon VI

3:30PM *Current Sensor Fault Detection and Reconfiguration for a Doubly Fed Induction Generator*
Kai Rothenhagen and Friedrich Fuchs 2732

3:55PM *Robust BDCM Sensorless Control With Position-Dependent Load Torque*
Chih-Kai Huang, Pei-Yu Yu and Hung-Chi Chen 2739

4:20PM *Direct-start of the flexible power conditioner with back-to-back converters*
Daocheng Huang, Yang Zhao, Xudong Zou, Xinmin Liu and Fengxiang Cao 2745

4:45PM *Disturbance Observer for Speed-Controlled Process with Non-Deterministic Time Delay of Feedback Information*
Markku Jokinen, Antti Kosonen, Markku Niemela, Jero Ahola and Juha Pyrhonen 2751

Power Quality and Utility Applications III, Chair: Toshiba Mitsubishi-Electric Industrial Systems Corp. Ruben Inzunza, Room: Salon VII

3:30PM *Determining IEEE 519 Compliance of a Customer in a Power System*
Joy Mazumdar and Ronald Harley 2758

3:55PM *Resolving Power Consumption of Variable Power Electronic Loads Using Nonintrusive Monitoring*
Warit Wichakool, Al-Thaddeus Avestruz, Robert W. Cox and Steven B. Leeb 2765

4:20PM *Balanced Power Aggregation of Asymmetric Single-phase Systems*
Sandeep Bala and Giri Venkataramanan 2772

4:45PM *Experimental Results on Contact-less Power Transmission System for the High-speed Trains*
Atsuo Kawamura, Gen Kuroda and Chi Zhu 2779

Energy Storage and Harvesting, Chair: Zhejiang Univesity Mark Dehong Xu, Room: Salon VIII

3:30PM *Novel Autonomous Low Power VLSI System Powered by Ambient Mechanical Vibrations and Solar Cells for Portable Applications in a 0.13um Technology*
Jordi Colomer, Jordi Brufau, Pere Lluis Miribel, Albert Saiz and Manel Puig 2786

3:55PM *Maximum Energy Harvesting Control for Oscillating Energy Harvesting Systems*
John Elmes, Venceslav Gaydarzhiev, Adje Mensah, Khalid Rustom and Z. John Shen 2792

4:20PM *The State and Parameter Estimation of an Li-Ion Battery Using a New OCV-SOC Concept*
S. J. Lee, J. H Kim, J. M Lee and Bo H. Cho 2799

4:45PM *State estimation of a lithium-ion battery through Kalman filter*
Matthieu Urbain, Stephane Rael, Bernard Davat and Philippe Desprez 2804

Wednesday, June 20, 6:30PM-8:00PM

Special Session: , Room: Salon IV and V (Exhibition)

Thursday, June 21, 8:30AM-10:10AM

DC-DC Converters : Control III, Chair: Intel Shamala Chickamenahalli, Room: Salon I

8:30AM *A novel control method of interleaved two-transistor forward converter*
Hongyang Wu, Xiao Chen, Min Zhou, John Zeng and Jianping Ying 2812

8:55AM *Quality factor in resonant gate drivers*
Toni Lopez and Reinhold Elferich 2819

9:20AM *Analysis of a single switch split dc-rail boost converter operated under steady-state unbalanced load conditions in discontinuous conduction*
John Salmon and Jeff Ewanchuk 2826

9:45AM *Design of an All-SiC Radio-frequency Controlled Parallel Dc-Dc Converter Unit*
Sudip Mazumder, Chuen-Ming Tan and Kaustuva Acharya 2833

Rectifiers, Chair: University of Nottingham Christian Klumpner, Room: Salon II

8:30AM *Space Vector Sequence Investigation and Synchronization Methods for PWM Modulation of a High Power Current Source Rectifier*
Yun Wei Li, Bin Wu, David Xu and Navid Zargari 2841

8:55AM *Power Quality Improvements in Isolated Twelve-Pulse AC-DC Converters Using Delta/Double-Polygon Transformer*
Bhim Singh, Sanjay Gairola, Ambrish Chandra and Kamal Al-Haddad 2848

9:20AM *A New Three-phase Rectifier for Regenerative Braking Application*
Lihua Li, Keyue Smedley and Taotao Jin 2854

9:45AM *Space vector modulation for Vienna-type rectifiers based on the equivalence between two and three-level converters: a carrier-based implementation*
Rolando Burgos, Rixin Lai, Yunqing Pei, Fred Wang and Dushan Boroyevich 2861

EMI-EMC I, Chair: Taiwan National University Dan Chen and University of Padova Paolo Mattavelli, Room: Salon III

8:30AM *Predistorted Pulse Width Modulation Technique for Switching Signal Spectrum Managenmet*
Xin Geng and Philip Krein 2869

8:55AM *An Investigation into Electric Field Coupling for Parasitic Effect Minimisation*
Ivan Hofsajer 2875

9:20AM *Common Mode DC-Bus Filter Design for Variable Speed Drive System with Transfer Ratio Measurements*
Dongsheng Zhao, Braham Ferreira, Henk Polinder and Sjoerd de Haan 2881

9:45AM *Negative Capacitance and Its Applications on Parasitic Cancellation for EMI Noise Suppression*
Shuo Wang and Fred C. Lee 2887

Power Factor Correction I, Chair: Rensselaer Polytechnic Institute Jian Sun and APECOR Khalid Rustom, Room: Salon VI

8:30AM *Comparative Study of Two Average-Model-Based PWM Control Schemes for a Sheppard-Taylor PFC*
Hadi Kanaan, Alfred Hayek and Kamal Al-Haddad 2893

8:55AM *Novel Duty Phase Control For Single-Phase Boost-Type SMR*
Hung-Chi Chen 2899

9:20AM *Interleaving Control Scheme for Critical-Mode Boost PFC*
J.-R. Tsai, T.-F. Wu, Y.-M. Chen and M.-C. Lee 2905

9:45AM *Investigation of Key Technique for High Efficiency and High Power Density, Single-Stage Power Factor Correction AC/DC Converter*
Lijun Hang, Liu Xinwei, Lu Zhengyu, Yang Yuefeng and Qian Zhaoming 2912

Active Filtering, Chair: MIT David Perreault, Room: Salon VII

8:30AM *Voltage and Current Unbalance Compensation Using a Parallel Active Filter*
Yan Xu, Leon Tolbert and John Kueck 2919

8:55AM *Inverter-Less Active Filters - A New Concept in Harmonic and VAR Compensation*
Jyoti Sastry and Deepak Divan 2926

9:20AM *A Novel Real-Time Detection Method of Active and Reactive Currents for Single-Phase Active Power Filters*
Toshihiko Tanaka, Yasushi Omura, Eiji Hiraki, Norio Ishikura and Masayoshi Yamamoto 2933

9:45AM *LCL Type Supply Filter for Active Power Filter - Comparison of an Active and a Passive Method for the Resonance Damping*
Mikko Routimo and Heikki Tuusa 2939

Lighting and Flat Panel Display I, Chair: City University of Hong Kong Ron Hui, Room: Salon VIII

8:30AM *Sequential Color LED Backlight Driving System for LCD Panels with Area Control*
Tsai-Fu Wu, Chien-Chih Chen, Chang-Yu Wu, Po-Chang Lu and Yu-Ren Chen 2947

8:55AM *Low Cost IGBT-Based Single-Sided Plasma Display Panel Driver*
Jacobo Aguillon-Garcia and Gun-Woo Moon 2953

9:20AM *A new dual sustaining driver using two-different energy recovery circuits for a large-sized plasma display panel (PDP)*
Kang Hyun Yi, Seong Wook Choi and Gun Woo Moon 2958

9:45AM *Novel LCD Backlight Inverter using a Simple Control Circuit*
Gang-Youl Jeong 2964

Thursday, June 21, 10:30AM-12:10PM

Other Power Electronics Applications, Chair: Infineon AG Manfred Schlenk, Room: Salon I

10:30AM *A Comparative Study of Analog Voltage-mode Control Methods for Ultra-fast Tracking Power Supplies*
Mikkel Hoyerby and Micahel Andersen 2970

10:55AM *An Optimized Converter for Battery-Supercapacitor Interface*
Giuseppe Guidi, Tore M. Undeland and Yoichi Hori 2976

11:20AM *Frequency Locked Phase Estimation Under Harmonically Distorted Conditions*
A. W. Krieger and J.C. Salmon 2982

11:45AM *Solid-state Marx generator design with an energy recovery reset circuit for output transformer association*
Luis Redondo, Jose Silva, Pedro Tavares and Elmano Margato 2987

Rectifiers and AC-AC Converters: Applications, Chair: Aalborg University Frede Blaabjerg, Room: Salon II

10:30AM *Novel Three-Phase Current-Fed Z-Source AC-AC Converter*
Xupeng Fang and Fangzheng Peng 2993

10:55AM *DFT-based Repetitive Control of a Series Active Filter Integrated with a 12-pulse Diode Rectifier*
Abraham le Roux, Hendrik Mouton and Hirofumi Akagi 2997

11:20AM *A Favorable Conditioning of the Harmonic Distortion Generated by a PDM Ac/ac Converter with Three-Phase Diode Rectifier*
Abdelhalim Sandali, Ahmed Cheriti and Pierre Sicard 3003

11:45AM *A New AC Bidirectional Switch with Regenerative Snubber to Realize a Simple Series Connection for High Power AC/AC Direct Converters*
Jun-ichi Itoh and Ken-ichi Nagayoshi 3009

EMI-EMC II, Chair: University of Central Florida Tom Wu, Room: Salon III

10:30AM *Reduction Methods of Conducted EMI Noise on Parallel Operation for AC Module Inverters*
Keiji Wada and Toshihisa Shimizu 3016

10:55AM *Extended Theory on the Inductance Calculation of Planar Spiral Windings Including the Effect of Double-layer Electromagnetic Shield*
Yipeng Su, Xun Liu and S.Y.R. Hui 3022

11:20AM *Enhanced Design of an Integrated Transmission-Line Bus Filter*
Baisden Andrew, Boroyevich Dushan and Jacobus van Wyk 3029

11:45AM *PEEC Models for Air-core Reactors Modeling Skin and Proximity Effects*
Mathias Enohnyaket and Jonas Ekman 3034

Power Factor Correction II, Chair: Ben-Gurion University Sam Ben-Yaakov, Room: Salon VI

10:30AM *A Three-Level Three-Phase Power Factor Control Rectifier*
Edison da Silva, Aluisio Bento, Katia de Almeida, Jonas Oliveira and Cursino Jacobina 3040

10:55AM *Analysis and Design of a Single-stage AC-DC Front-end Resonant Converter with a New Active Control Technique*
Mohamed Youssef and Praveen Jain 3046

11:20AM *A Three-Phase Single-Switch High Power Factor Buck-Type Converter Operating With Soft-Switching*
Sondeep Bassan and Gerry Moschopoulos 3053

11:45AM *A Novel Three-Phase Three-Level Power Factor Correction (PFC) Converter Using Two Single-Phase PFC Modules*
Jingtao Tan, Yang Li, Zhiqiang Jiang, Li Cai and Jianping Ying 3060

Utility Grid Support Technologies, Chair: Siemens Joy Mazumdar, Room: Salon VII

10:30AM *Fast Dynamic Control Scheme for Capacitor-Supported Dynamic Voltage Restorers: Design Issues, Implementation and Analysis*
Carl N.M. Ho and Henry S.H. Chung 3066

10:55AM *Utility Power Quality Control by using A Three Phase Inverter Module*
Tokuo Ohnishi and Masahide Hojo 3073

11:20AM *Mitigating Zero Sequence Effects in Dynamic Voltage Restorers*
Don Mahinda Vilathgamuwa and Herath Mudiyanselage Wijekoon 3079

11:45AM *Zero Energy Storage Voltage Sag Correctors for Industrial Applications*
Anish Prasai, Neha Kelkar and Deepak Divan 3086

Lighting and Flat Panel Display II, Chair: CENIDET Mario Ponce Silva, Room: Salon VIII

10:30AM *Self-Oscillating Constant-Current Fluorescent Lamp Driver: Theory and Application*
Sam Ben-Yaakov, Mor M. Peretz, Jorge M. Sr. Parra and Jorge M. Jr. Parra 3093

10:55AM *Investigation of Losses in Commercially Available Self-Resonating Ballasts for Compact Fluorescent Lamps*
Mohsin Shafi, Richard McMahon and Sven Weier 3100

11:20AM *A Low Cost Single-Stage Electronic Ballast with Unity Power Factor Using a Novel Single Switch Current Fed Resonant Inverter Topology*
John Lam and Praveen K Jain 3106

11:45AM *Design of a Novel Low-Frequency Square-Wave Digital Electronic Ballast for HID Lamps*
Zhuang Zuo, Dianguo Xu, Xiangjun Zhang and Hankui Liu 3112

Thursday, June 21, 12:15PM-2:15PM

, Room: Salon IV and V (Exhibition)

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