

2009 Compatibility and Power Electronics

(CPE)

**Badajoz, Spain
20 – 22 May 2009**



IEEE Catalog Number: CFP09851-PRT
ISBN: 978-1-4244-2855-7

**Copyright © 2009 by the Institute of Electrical and Electronic Engineers, Inc
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

******This publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP09851-PRT
ISBN 13:	978-1-4244-2855-7
Library of Congress No.:	2008907493

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com

2009 COMPATIBILITY AND POWER ELECTRONICS

CPE2009

TECHNICAL CO-SPONSORSHIP BY IEEE INDUSTRIAL ELECTRONICS SOCIETY

6TH INTERNATIONAL CONFERENCE-WORKSHOP
MAY 20-22, 2009 BADAJOZ SPAIN

Power Quality, Alternative Energy and Distributed Systems

DSP for the Real Time Detection of Power Quality Surge Transients.....	1
..... <i>A. Moreno-Muñoz, J. J. G. de la Rosa, V. Pallarés and J.M Flores</i>	
Categorization of minimum error forecasting zones using a geostatistic wind model.....	6
..... <i>A. Agüera, J.G. Ramiro, J. J. G. de la Rosa, J. Melgar, J.C. Palomares and A. Moreno</i>	
Power Quality Immunity in Factory Automation	12
..... <i>A. Moreno-Muñoz, J.M Flores-Arias, V. Pallarés and J. J. G. de la Rosa</i>	
An Electrothermal Model for Investigation of Harmonic Effects Produced by Power Electronic Devices on Protection Elements	18
..... <i>A.H.Gheisari, E.Farjah and H. Abiri</i>	
A Novel Technique to Reliability Evaluation Considering Priority of Load Curtailment for Deregulated Distribution System.....	23
..... <i>Ali Saidian, Mohamad Amiri</i>	
Ancillary Services to Grids Provided with Distributed Generation	29
..... <i>Ryszard Strzelecki, Grzegorz Benysek, Marcin Jarnut, Robert Smolenski, Bartosz Mactejewski</i>	
Power Injection System for Photovoltaic Generation Plants with Active Filtering Capability.....	35
..... <i>Enrique Romero-Cadaval, María-Isabel Milanés-Montero, Fermín Barrero-González, Eva González-Romera</i>	
Evolutionary algorithm to optimize the power flow in a network using series compensators.....	43
..... <i>Pablo Fernández-Comesaña, Jesús Doval-Gandoy, Eloy Diaz-Dorado, David Alvira-Baeza</i>	
Wavelet-based algorithms for triggering power quality measurement instruments	48
..... <i>David Gonzalez, Josep Balcells, Juan Mon</i>	
Multipulse Diode Converters – Frequency Domain Analysis of Operation of the Applied Coupled Three-Phase Reactor.....	53
..... <i>Piotr Mysiak</i>	
Definition of complex admittance of electric isolation without disconnection of electrical equipment.....	61
..... <i>Nikolay Grebchenko, Igor Koval, Aleksey Sidorenko, Mariya Smirnova</i>	
On the use of sun trackers to improve maximum power point tracking controllers applied to photovoltaic systems.....	67
..... <i>Carles Jaen, Josep Pou, Gabriel Capella, Antoni Arias and Manuel Lamich</i>	
Control to reduce leading current in a Shunt Hybrid Power Filter.....	73
..... <i>Manuel Lamich, Josep Balcells, David Gonzalez, Xavier Gago, Carles Jaén, Jose Luis Castillo</i>	
Comparison of Controllers for a Three-phase Phase Locked Loop System under Distorted Conditions.....	79
..... <i>V. Miñambres, M.I. Milanés, B. Vinagre, E. Romero</i>	
Quality Meter of Electric Power Systems based on IEEE Standard 1459-2000	86
..... <i>M. I. Milanés, V. Miñambres, E. Romero, F. Barrero</i>	
Overview of Medium Scale Energy Storage Systems.....	93
..... <i>M.A. Guerrero, E. Romero, F. Barrero, M. I. Milanés, E. González</i>	
Harmonic Propagation in a Doubly Fed Induction Generator of a Wind Energy Converter.....	101
..... <i>Steffen Schostan, Klaus-Dieter Dettmann, Trung Do Thanh and Detlef Schulz</i>	

Hybrid Green Micro-cogeneration Using Common Dc Bus Hybrid Scheme	<i>Adel M. Sharaf, Moataz Ammar, Ismail H. Altas</i>	109
Control of the stalling behaviour in Wave Power Generation Plants....	<i>Modesto Amundarain, Mikel Alberdi, Aitor Garrido, Izaskun Garrido</i>	117
Harmonic Distortion Index for Stationary and Transient States		
..... <i>Juan-Carlos Montaño, Maria-Dolores Borrás, Manuel Castilla, Antonio López, Jaime Gutiérrez, and Juan-Carlos Bravo</i>		123
Voltage Limitation by Autonomous Reactive Power Control of Grid Connected Photovoltaic Inverters		
..... <i>Georg Kerber, Rolf Witzmann, Hannes Sappl</i>		129
Verification of Management Methods for Power Storage in Wind Parks.....	<i>Constantinos Sourkounis, Florian Richter, Bingchang Ni</i>	134
Control of AC-DC-AC Converter under Unbalanced and Distorted Input Conditions		
..... <i>Marek Jasinski, Marian P. Kazmierkowski, Malgorzata Bobrowska, Piotr Okon</i>		139
Particle Swarm Optimization Applied for the Improvement of the PWM AC/AC Choppers Voltage		
..... <i>Kouzou A, Saadi S, Mahmoudi M.O, Boucherit M.S</i>		146
Overall and Selective Compensation of Harmonic Currents in Active Filter Applications		
..... <i>Lucian Asiminoaei, Sergej Kalaschnikow, Steffan Hansen</i>		153
Simulink Models of Power Electronic Converters for DC Microgrid Simulation		
..... <i>Piotr Biczal, Lukasz Michalski</i>		161
Specificity of influence on supply grid of the drill rig converter drives for oil and gas exploration.....		
..... <i>Radoslaw Kowal, Roman Muszynski</i>		166
Performances of the Adjustable Speed Decoupled Generation Systems.....	<i>Wlodzimierz Koczara, Grzegorz Iwanski, Zdzislaw Chlodnicki</i>	174
The integral method to calculate the power states in electrical circuits	<i>Marek T. Hartman</i>	180
Cascaded Doubly Fed Induction Generator Using PFC Rectifiers	<i>Marek Adamowicz, Ryszard Strzelecki, Piotr Mysiak</i>	186
New Type T-Source Inverter	<i>Ryszard Strzelecki, Marek Adamowicz, Natalia Strzelecka, Wieslaw Bury</i>	191

Power Electronics Controllers for Power Systems

On Control of Gate Controlled Series Capacitor for SSR and Power Oscillation Damping		
..... <i>Hossein Ali Mohammadpour, Mohammad Reza Alizadeh Pahlavani, Abbas Shoulaie</i>		196
Single-Phase 50-kW, 16.7-Hz Railway-Grid Lab Representation using a DC-Excited Slip-Ring Induction Generator.....		
..... <i>M. Gorski, C. Heising, V. Staudt and A. Steimel</i>		204
Implications of Resonant Circuit Adjustment Errors to the DC-link voltage in Single-Phase 16.7-Hz-Railway Applications		
..... <i>C. Heising, M. Oettmeier, M. Gorski, V. Staudt and A. Steimel</i>		210
PLL and DFT feed-forward control for railway single-phase line-converter synchronization		
..... <i>R. Bartelt, C. Heising, V. Staudt and A. Steimel</i>		217
LQ-optimized multivariable control for a single-phase 50-kW, 16.7-Hz railway-grid representation featuring variable grid parameters.....		
..... <i>M. Oettmeier, M. Gorski, C. Heising, V. Staudt and A. Steimel</i>		224
Single-phase 50-kW 16.7-Hz PI-controlled Four-Quadrant Line-Side Converter Lab Model fed by Rotary Converter		
..... <i>C. Heising, M. Oettmeier, R. Bartelt, V. Staudt and A. Steimel</i>		232
Approximation of Transient Torque Response of a Traction Drive Controlled by Indirect Stator-Quantities Control (ISC).....		
..... <i>M. Spichartz, C. Heising, V. Staudt and A. Steimel</i>		240
Control Algorithm for a SSSC.....	<i>Pablo Fernández, Francisco D. Freijedo, Jesús Doval-Gandoy, Member, IEEE, Jano Malvar</i>	248
Reliability Assessment of Single-Stage/Two- Stage PFC converters		
..... <i>Amir Hossein Ranjbar, Babak Abdi, Gevork B. Gharehpetian, Babak Fahimi</i>		253
Comparison of Control Methods for High-Voltage High-Power Three-Level Half-Bridge DC/DC Converters		
..... <i>Indrek Roasto, Dmitri Vinnikov, Ilja Galkin</i>		258
Modeling Methods for Solid State Power Controllers (SSPC)	<i>D. Izquierdo, A. Barrado, M. Sanz, C. Fernández, P. Zumel</i>	265
Control of grid-connected DC-AC Converters in Distributed Generation: Experimental comparison of different schemes		
..... <i>T. Hornik and Q. C. Zhong</i>		271
Speed Anti-Windup PI strategies review for Field Oriented Control of Permanent Magnet Synchronous Machines		
..... <i>Jordi Espina, Antoni Arias, Josep Balcells and Carlos Ortega</i>		279
High Frequency Grid Impedance Analysis with Three-Phase Converter and FPGA Based Tolerance Band Controller.....		
..... <i>A. Knop, F.W. Fuchs</i>		286
Control of a shunt active power filter based on a three-leg four-wire electronic converter		
..... <i>P. García-González, A. García-Cerrada and O. Pinzón-Ardila</i>		292
Novel Predictive Control of 3-Phase LCL-based Active Power Filter.....	<i>Daniel Wojciechowski</i>	298

Electro-mechanical Energy Conversion

Simulation Instruments to Study Power Electronics of Motor Drives	<i>Zoja Raud, Valery Vodovozov, Tanel Jalakas and Juhan Laugis</i>	306
Input EMI Filter Re-design in AC Motor Drives with Active Compensation of Motor CM Voltage.....		
..... <i>Maria Carmela Di Piazza, Antonella Ragusa, Gianpaolo Vitale</i>		311
Electronic Commutator with Parallel Capacity Storage for Switched Reluctance Motor	<i>Vasyl Tkachuk, Marius Klytta</i>	318

Torsional Analysis and Coupling Selection for Electric Machine Coupled to Reciprocating Equipment	<i>Amin Almasi</i>	324
A Comparison of Efficiency for three-level NPC and Active NPC Voltage Source Converters .....	..... .....<i>Dan Floricau, Claudia-Laurenta Popescu, Mihai-Octavian Popescu, Elena Floricau, Lucian Spataru</i>	331
S-Curve-Control for Active Load Peak Damping in the Drive Train	<i>Constantinos Sourkounis</i>	337
Trigeneration Energy System for the Campus of the University of Rijeka.....	<i>Bernard Frankovic, Zarko Dubrovic, Bojan Jurdana</i>	343
Magnetic Field Analysis of Permanent Magnet Low-Speed Synchronous Generators for Wind Applications .....	..... .....<i>Aleksander Kilk, Jaan Järvi, Viktor Kesküla</i>	348
<hr/>		
EMI and ESI Problems		
Reduction of EMI by Combining Interleaving and Modulation Techniques in Multiconverter Topology .....	..... .....<i>J. Mon, J. Gago, D. González, J. Balcells, R. Fernández, I. Gil</i>	353
Effect of Leakage Inductance on High Frequency Transformer Harmonics.....	..... .....<i>Babak Abdi, Mohammad Hadi Joukar, Amir Hossein Ranjbar</i>	359
Analyse, identification, and modelling of electromagnetic disturbance sources. Actual signal approach applied to power supply unit .....	..... .....<i>Sega Gueye, Brayima Dakyo, Jacques Raharjaona, David Baudry, Zouheir Riahi, Sylvain Alves, Philippe Eudeline</i>	363
An Efficient Procedure for Computing Lightning Induced Overvoltages on Overhead Lines.....	..... .....<i>Andrés Vanegas, Esteban Velilla, Javier Herrera, Jaime Alejandro Valencia</i>	368
Spectral Analysis of Nonstationary Low-Frequency Magnetic-Field Emissions from Ship's Power Frequency Converters.....	..... .....<i>Beata Palczynska</i>	375
Aggregated Conducted EMI Generated by Group of Frequency Converter-Fed Drives .....	..... .....<i>Robert Smolenski, Adam Kempinski, Grzegorz Benysek</i>	381
Motor Cable Influence on the Converter Fed AC Motor Drive Conducted EMI Emission	<i>Jaroslawn Luszcz</i>	386
<hr/>		
Special Power Electronic Systems and Applications		
Higher-Order Characterization of Power Quality Transients and their Classification using Competitive Layers .....	..... .....<i>Juan José González de la Rosa, Antonio Moreno-Muñoz</i>	390
The Former of Special Form Current Pulses for Micro Resistance Welding.....	..... .....<i>Yuriy E. Paerand, Oleksandr F. Bondarenko, Yuliya V. Bondarenko</i>	396
Dynamic Response Optimization of the Synthetic Ripple Modulator (SRM) for a Point-of-Load (POL) Converter with Adaptive Voltage Positioning (AVP) .....	..... .....<i>Santanu K. Mishra, Khai D. T. Ngo</i>	402
Unity Power Factor Isolated Three-Phase Buck- Boost Rectifier Based on Scott Transformer.....	..... .....<i>V. Fernão Pires, Manuel Guerreiro, J. F. Martins and J. Fernando Silva</i>	406
Passivity-Based Control With Dual Lagrangian Model Of Four-Wire Three-Level Three-Phase NPC Voltage-Source Rectifier.....	..... .....<i>Majid Mehrasa, Saeed Lesan, Seyed Nima Hoseini Emeni, Abdolreza Sheikholeslami</i>	411
Control Strategy Improvement for a Parallel Power Distribution Architecture Based on Fuel Cells and Supercapacitors.....	..... .....<i>C. Raga, A. Barrado, I. Quesada, A. Lázaro, M. Sanz</i>	419
Optimization of Wireless Power Transmission through Resonant Coupling.....	..... .....<i>Yong-Hae Kim, Seung-Youl Kang, Myung-Lae Lee, Byung-Gon Yu, and Taehyoung Zyung</i>	426
Evaluative Analysis of 2- and 3-level DC/DC Converters for High-Voltage High-Power Applications .....	..... .....<i>Dmitri Vinnikov, Mikhail Egorov, Ryszard Strzelecki</i>	432
Interlock Delay Time Minimization and its Impact on the High-Voltage Half-Bridge DC/DC Converter.....	..... .....<i>Tanel Jalakas, Dmitri Vinnikov, Tõnu Lehtla, Viktor Bolgov</i>	438
Electric Power Controller for Steering Wheel Management in Electric Cars .....	..... .....<i>Vicente Milanés, Joshué Pérez, Enrique Onieva, Carlos González, Teresa de Pedro</i>	444
Improved modulator for THD reduction in onboard generation of three phase AC voltage.....	..... .....<i>I. Quesada, A. Lázaro, C. Martínez, C. Lucena, A. Barrado, R. Vázquez, I. González, N. Herreros</i>	450
A New Novel DC Booster Circuit to Reduce Stray Current and Rail Potential in DC Railways .....	..... .....<i>Reza Fotouhi, Stamak Farshad, Seyed Saeed Fazel</i>	457
Sensorless Control of the Axial Flux Permanent Magnet Synchronous Motor at Standstill and at Low Speed.....	..... .....<i>Janusz Wisniewski, Włodzimierz Koczara</i>	463
Use of Discrete Transforms with m-ary Argument for Remote Control and Diagnostics of Semiconductor Converters .....	..... .....<i>Valerii Zhuikov, Iuliia Petergeria, Yuriy Khokhlov, Tetyana Klyzhnyak</i>	469