

# **2024 IEEE 15th International Symposium on Power Electronics for Distributed Generation Systems (PEDG 2024)**

**Luxembourg**  
**23-26 June 2024**



**IEEE Catalog Number:** CFP24PEG-POD  
**ISBN:** 979-8-3503-6101-8

**Copyright © 2024 by the Institute of Electrical and Electronics 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 is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP24PEG-POD
ISBN (Print-On-Demand):	979-8-3503-6101-8
ISBN (Online):	979-8-3503-6100-1
ISSN:	2329-5759

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

## TABLE OF CONTENTS

Re-Evaluating Rural Electrification Options for the Energy Transition .....	1
<i>Pinar O. Ekim, Erhan Demirock, Kiswendsida E. Ouedraogo</i>	
Efficiency-Driven Design of a Reconfigurable Asymmetric LLC Converter with Ultrawide Output Voltage Range for EV Charging Applications .....	6
<i>Sergio Fernández-Rojas, Dongsheng Yang, Krzysztof Puczko</i>	
A Simple Global Maximum Power Point Tracking Scheme with Region Segmentation for Partially Shaded PV Modules .....	12
<i>Yinxiao Zhu, Yongheng Yang, Frede Blaabjerg, Runze Lv</i>	
$\eta-\rho$ Pareto Design of a Balancing Converter for Bipolar DC Grids .....	18
<i>Sachin Yadav, Zian Qin, Pavol Bauer</i>	
An Active Power Decoupling Strategy to Reduce the Capacitor Size of a Cascaded H-Bridge Converter in a Solid State Transformer .....	24
<i>Sachin Yadav, Zian Qin, Pavol Bauer</i>	
S.A.P.I.E.N.T.E. Hybrid System: An Experimental Test Facility Focused on Energy Generation and Hybrid Storage for Self-Consumption Strategies .....	30
<i>Alessandro L. Palma, Luca La Notte, Ruggero Nissim, Biagio Di Pietra</i>	
Modeling and Validation of Input Impedance for Three-Phase PWM Rectifier for Aviation Applications.....	35
<i>Zixiao Xu, Hongwei Zhao, Siyang Liang, Zixuan Guo, Yufeng Wang, Weilin Li, Yang Qi</i>	
A Power Allocation Strategy for Hybrid Energy Storage System with Virtual Inertia Support .....	41
<i>Jialei Su, Kang Li, Wei Zuo</i>	
Adaptive Control for Enhanced Performance in Grid-Connected Agricultural Machines .....	46
<i>Pedro Dos Santos, Marcel Wingert, Marco Guerreiro, Steven Liu</i>	
Reliable Decentralized Control Scheme of DC Microgrid using Transition Operations Under DC- Link Voltage Sensor Faults.....	52
<i>Dat T. Tran, Muhammad A. M. Jabbar, Seong-Bae Jo, Sung D. Kim, Kyeong-Hwa Kim, Myungbok Kim</i>	
A Hybrid Dead-Time Control for Totem Pole Bridgeless PFC .....	58
<i>Tianyi Huang, Li Peng, Shuang Lu</i>	
Hybrid Control for Integrating Grid-Forming and Grid-Following Capabilities in a Single VSI: An Efficiency-Driven Approach.....	64
<i>Iman Lorzadeh, Omid Lorzadeh, Dimitar V. Bozalakov, Luc Dupré, Lieven Vandervelde</i>	
A Novel SeqGAN-LSTM Load Forecasting Framework for Electric Vehicle Charging Stations with Missing Data.....	70
<i>Xiaohai Ge, Xin Zhang, Dehong Xu</i>	
A Robust Phase-Lock-Loop for Grid-Following Converters.....	76
<i>Gengning Ying, Jun Zeng, Jie Song, Ni Liu, Minhai Wu, Eduardo Prieto-Araujo, Junfeng Liu</i>	
Multiport Y-Converter for Three-Phase AC Grid Integration with DC Systems .....	81
<i>Ahmed Y. Farag, Davide Biadene, Tommaso Caldognetto, Paolo Mattavelli</i>	

Open Battery Platform: Open-Source Power Electronic Devices for Renewable Generation and Energy Storage Technology.....	87
<i>Peter Teske, Marius Gentejohann, Dorothea Wiemann, Lars Krüger, Julia Kowal, Sibylle Dieckerhoff</i>	
Selective Virtual Impedance for Overcurrent Limitation in Grid-Forming Inverters Under Asymmetrical Faults.....	93
<i>Alvaro Morales-Munoz, Francisco D. Freijedo, Sante Pugliese, Marco Liserre</i>	
Decoupled Robust Backstepping Control of Multiphase Interleaving Converters for Power-to-Hydrogen Systems in DC Microgrids.....	98
<i>Aqeel U. Rahman, Filippo Pellitteri, Nicola Campagna, A. O. Di Tommaso, Rosario Miceli</i>	
Mission Profile Emulator for Sub-Modules in CHB-BESS of Frequency Support Applications.....	104
<i>Moxi Wang, Lingqi Tan, Ke Ma</i>	
A Novel Approach for Removing Decaying DC Offset from Fault Current Signals using Cumulative Sum – Fast Moving Average (CumSum-FMA) Hybrid Algorithm.....	110
<i>Philip Abel, Friedrich Wiegel, Michael Kyesswa, Simon Waczowicz, Veit Hagenmeyer</i>	
A Brain Emotional Learning - Based Speed Control Strategy for DC Motors.....	115
<i>Ashkan Safari, Hoda Sorouri, Arman Oshnoei, Frede Blaabjerg</i>	
Impedance-Based Stability Analysis of Grid-Forming Inverters with Virtual Impedance or Angle Droop for Improved Robustness.....	122
<i>Robin Strunk, Pieris Sourkounis, Axel Mertens</i>	
Real-Time Challenges of Co-Simulation Framework for Integrated Grid Operations System .....	128
<i>Abdul S. Mohammed, Johan Enslin, Zachary Smith</i>	
LoT-Enabled Rapid Global Maximum Power Point Tracking for Multiple Photovoltaic Inverters .....	134
<i>Kangjia Zhou, Feng Gao, Caiyun Qin, Xiangjian Meng</i>	
Multi-Time Scale and Electro-Thermal Model Based Reliability and Efficiency Evaluations for Resonant Converter .....	139
<i>Yanjie He, Ziang Li, Shuo Zhang, Yuqi Wei</i>	
Hybrid Energy Storage Enhanced STATCOMs.....	145
<i>Aleksandr Viatkin, Shih-Feng Chou, Tim Augustin, Akif Z. Khan, Ali Tayyebi, Haofeng Bai, Jan R. Svensson</i>	
Spatial-Temporal Prediction of Schedulable Capacity of Electric Vehicles Based on Graph Convolutional Network with Spatial-Attention.....	150
<i>Meiqin Mao, Jixun Wu, Cheng Yang, Yuanyue Wang, Yan Du, Minglei Zhu, Zhang Wei, Liuchen Zhang</i>	
Comparing STATCOM Direct and Indirect Control Algorithms: A Laboratory Investigation .....	156
<i>Zaid H. Ali, Bence Süto, Tamas Guth, David Raisz</i>	
A Unified DC-Link Switching Ripple Suppression Modulation Method for Modular Multilevel Converters Including Step-Down Mode .....	162
<i>Zhifeng Deng, Jinjun Liu, Sixing Du, Jun Zhang, Ning Guo, Zeng Liu</i>	
Power Plant Control with Configurable Reserves for Grid-Forming Solar Power Plants with Hybrid Storage.....	168
<i>Juan D. Rios-Peña, Gabriel García-Gutiérrez, Milan Prodanovic, Javier Roldán-Pérez</i>	

Implementation of a Droop and Synchronization Control for Grid- Forming Fictitious Synchronous Generator Controlled Power Converters in Microgrids.....	174
<i>Florian Redmann, Alexander Ernst, Amir Ebrahimi, Bernd Orlit</i>	
Discussion on Voltage Regulation Alternatives in Distribution Networks with Massive Distributed Generation .....	180
<i>Silvangela L. Barcelos, Jakelini O. Soeiro, Edson H. Watanabe</i>	
Automation Framework for Blockchain-Based Coordination of Distributed Energy Resources .....	186
<i>Cesar Cazal, Su M. Tun, Irtaza Waheed, Manuel Pitz, Yoga Kannan, Thanakorn Penthong, Ferdinanda Ponci, Antonello Monti</i>	
A Non-Parametric Approach to Harmonic Instability Mitigation for Renewable-Based Power Plants.....	192
<i>Sriram K. Gurumurthy, Antonello Monti</i>	
An Improved Distributed Economic Control Strategy in Combination with Unitized Regenerative Fuel Cell Stack .....	198
<i>Jinyu Yu, Lidan Zhou, Gang Yao, Tianyou Yu</i>	
Grid-Forming Photovoltaic Generators Operating During Power System Transients .....	204
<i>Javier Roldan-Perez, Milan Prodanovic, Justino Rodrigues, Carlos Moreira</i>	
Application of Statistical Model Checking for Robustness Comparison of Power Electronics Controllers.....	210
<i>Mateja Novak, Iwona Grobelna, Ulrik Nyman, Frede Blaabjerg</i>	
An Optimal Power-Splitting Strategy for Hybrid Storage Systems .....	216
<i>Adolfo Anta, Catalin Gavrilita, Denis Vettoretti, David Cabezuelo, Eneko Unamuno</i>	
A Dominant Oscillatory Nodes Localization Method for Multi-Converter-Fed Power Systems .....	222
<i>Donghui Zhang, Xin Chen, Fan Yang</i>	
Universal Interoperable Control Framework for Inverter-Based-Resources .....	227
<i>Pranjal M. Gajare, Joseph Benzaquen, Deepak Divan</i>	
Reactive Current Injection Strategy Under Faults for Grid-Forming Converters Based on the Virtual-Flux Orientation .....	233
<i>Juan D. Fernández, Santiago A. Gomez, Joaquín E.-G. Carrasco, Jose L. R. Amenedo</i>	
Development of GaN-Bases Three-Phase Grid-Tie Inverter .....	239
<i>Orkhan Karimzada, Giulio De Donato</i>	
Seamless Dual Mode Control Scheme for Dual Active Bridge Converter to Achieve Full Load Range Soft Switching and Minimum Current Stress.....	244
<i>Karthik S. Parihar, M. K. Pathak</i>	
Testing the Local Stability of a Multi-Machine Power System with Constant Power Loads .....	250
<i>Yoash Levron, Alan Valadez, George Weiss</i>	
Grid-Forming Converter with Improved Dynamic and Disturbance Rejection Capability .....	256
<i>Amiron W. D. S. Serra, Luiz A. D. S. Ribeiro, Mehdi Savaghebi</i>	
Comparison Analysis of Short Circuit Ratio Variants on the Indication of Power System Voltage Stability .....	262
<i>Jianyu Zhou, Fangzhou Zhao, Heng Wu, Xiongfei Wang</i>	

A Robust Model Predictive Control for PLL-Based Grid-Connected Converter Under Weak Grids.....	268
<i>Shuai Yuan, Zhixiang Zou, Fujin Deng, Marco Liserre</i>	
Efficient Communication for Decentralized Federated Learning: An Energy Disaggregation Case Study.....	274
<i>Yusen Zhang, Feng Gao, Kangjia Zhou</i>	
Power Fluctuation Suppression in Energy Storage for PV-Battery GFM Systems .....	279
<i>Kai Yin, Yinzhang Peng, Lu Zhang, Qi Zhao, Yongheng Yang</i>	
Harmonic Distortion Analysis of an eGPU-Fed Aircraft EPDS with Phase-Shifted Carrier PWM .....	285
<i>Qilin Peng, Jiaqin Sun, Jiajun Yang, Giampaolo Buticchi, Nadia M. L. Tan, Sandro Guenter, Patrick Wheeler</i>	
ANN-Based Real-Time Optimal Voltage Control in Islanded AC Microgrids.....	291
<i>A. Alelah Derbas, Chiara Bordin, Sambeet Mishra, Frede Blaabjerg</i>	
Development of a Two-Level, Four-Leg Smart Inverter for Microgrid Applications .....	296
<i>Buck F. Brown, Jan Westman, Johan Enslin, Zheyu Zhang</i>	
Evaluation of the Grid-Forming Inertial Response for Power Reference and Grid-Supporting Functionalities .....	302
<i>J. Rocabert, B. Garcia, J. I. Candela, Juan D. Villón, P. Rodriguez</i>	
A Methodology for Analysis and Design of Dispatchable Virtual Oscillator Grid-Forming Control Methods.....	308
<i>Armando J. G. Abrantes-Ferreira, Alexandre C. Oliveira, Antonio M. N. Lima</i>	
The Matrix Hybrid Solid State Transformer: Leveraging Three Phase Systems for Enhanced Grid Capabilities.....	314
<i>Sanjay Rajendran, Alex Q. Huang</i>	
A Novel Regulated High-Frequency DC Transformer for Intermediate Bus Architecture Application .....	320
<i>Jinru Qian</i>	
A Remote Voltage Supply Method Based on Sinusoidal-Excitation Cable Impedance Detection .....	325
<i>Mingzhu Fang, Donglai Zhang, Xianbin Qi, Jun Wu, Zhihao Wang</i>	
Dynamic Modeling of Differential DC-DC Converters using Thévenin Equivalent Circuit.....	330
<i>Marcos A. Salvador, Tailan Orlando, Denizar C. Martins, Marcelo L. Heldwein, Telles B. Lazzarin, André L. Kirsten, Roberto F. Coelho</i>	
Analysis of Power Quality Improvement Techniques Applied to Grid-Connected Wind Power Plants .....	336
<i>Mohib Ullah, Yajuan Guan, Juan C. Vasquez, Josep M. Guerrero</i>	
New Symmetrical Power-Flow Controllers for Universal Application in Meshed DC Grids .....	342
<i>Sreedhar Kammana, Rainer Marquardt, Thomas Bruckner</i>	
Adaptive Inertia Estimation Based on Projection Identification Algorithm Applied to Unbalance Systems with VSM.....	348
<i>Ana Marin-Hurtado, Andrés Escobar-Mejía, Alfonso Alzate-Gómez</i>	
Stability Analysis of a Grid-Forming Converter Without an Inner Current Control .....	354
<i>Werner Fritzsche, Tayssir Hassan, Sibylle Dieckerhoff</i>	

Application of Hybrid <i>GaN-IGBT</i> Device Combination for Switched-Capacitor Based Multilevel Inverter Topology with Uniform Power Losses.....	360
<i>Marif D. Siddique, Prasanth Sundararajan, Kolantla Dharani, Mrutyunjaya Sahani, Rahul S. Bhujade, Sanjib K. Panda</i>	
Optimal Re-Dispatch and Reactive Power Management in the Fuerteventura-Lanzarote Grid using Real-Time Optimization in the Loop.....	365
<i>Carolina M. Martín, Francisco Arredondo, Santiago Arnaltes, Jaime Alonso-Martínez, José L. R. Amenedo</i>	
Emulation of a Battery-Sourced Black Start Through Grid-Forming Control of a Converter Test Bench.....	371
<i>Antonio Mielach, Florian Redmann, Alexander Ernst, Amir Ebrahimi, Holger Raffel</i>	
Asymmetric Operation of Power Lines by using E-STATCOM and Internal Model Controllers .....	377
<i>Ansar Berdygozhin, Benjamin Pepper, David Campos-Gaona</i>	
Comparative Analysis of Bond Wire Degradation in Power Modules During DC and AC Power Cycling .....	383
<i>Kaichen Zhang, Francesco Iannuzzo, Frede Blaabjerg</i>	
Impedance Estimation for Transient Stability Enhancement of Virtual Synchronous Machines .....	389
<i>Benjamin Pepper, David Campos-Gaona</i>	
Power Hardware-in-the-Loop Test Bench for DC Grid and Battery Emulation.....	395
<i>Fabian Herzog, Benedict Mortimer, Rik W. De Doncker</i>	
Operation Maps for Hybrid Electrolyser and Battery Systems - A Luxembourgish Case Study.....	401
<i>Ángel Paredes, José A. Aguado, Philipp Fisch, Patrick Witte, Sebastian Theissen, Pedro Rodriguez</i>	
Machine Learning-Based Condition Monitoring of DC-Link Capacitors in Drive Inverters using Case Temperature .....	407
<i>Prasanth Sundararajan, Marif D. Siddique, Mrutyunjaya Sahani, Jaydeep Saha, Sanjib K. Panda</i>	
Advanced Photovoltaic Flexible Power Control Method Under Fast Changing Irradiance in Distributed PV-BESS System.....	413
<i>Qiang Bi, Kai Sun</i>	
Cyber Secure-Oriented Communication Network Design for Microgrids .....	419
<i>Junjie Xiao, Lu Wang, Pavol Bauer, Zian Qin</i>	
Harmonic Forecasting in Power Electronics: AI-Driven Machine Learning Modeling Approach for Voltage Source Converters .....	425
<i>Ahmed S. Abdelsamad, Zhixiang Zou, Johanna Myrzik, Moustafa Fouz</i>	
The Study on EMI Characteristics Under Various Operational Conditions in DC-DC Converter for Electric Vehicle.....	430
<i>Jisu Yu, Kilho Lee, Junho Cho, Beomjin Choi</i>	
A Decentralized Control System for Series-Connected Grid-Integrated Photovoltaic Inverters.....	434
<i>Saleh Farzamkia, Halladi S. K. Kedlaya, Alex Q. Huang</i>	
Decoupled Robust Backstepping Control of Multiphase Interleaving Converters for Power-to-Hydrogen Systems in DC Microgrids.....	440
<i>Aqeel U. Rahman, Filippo Pellitteri, Nicola Campagna, A. O. Di Tommaso, Rosario Miceli</i>	

Realization of Real-Time Simulation of Power Electronics Systems in Applications - A Review of Requirements and Methods .....	446
<i>Julian Saele, Ian O'Bryan</i>	
Exploring Non-Convexity Characteristics of Active Trap Filter Based on Local Optimal Control .....	452
<i>Boyuan Cui, Chao Gao, Liang Huang, Wenlong Ding, Poh C. Loh</i>	
Active and Reactive Power Management of Hybrid Energy Systems for Reactive Power Support in Distribution Network.....	457
<i>Hamed Bizhani, Fatemeh R. Tatari, Grzegorz Iwanski</i>	
A Decentralized Secondary Voltage Control and Unbalance Voltage Compensation Method in Islanded Microgrids.....	463
<i>Yidong Shi, Zeng Liu, Jinjun Liu, Wenchen Wang</i>	
Comparative Analysis of Grid-Forming Control of Energy Storage Systems for Black-Start .....	469
<i>Lingjun Yao, Yunuo Yuan, Yongheng Yang, Yinzhang Peng, Lu Zhang, Qi Zhang</i>	
A Current-Limiting Direct Voltage Model Predictive Control for DC-DC Boost Converter .....	475
<i>Fatemeh R. Tatari, Hamed Bizhani, Grzegorz Iwanski</i>	
Predictive Encoderless Control with EKF for PMSG-Based Wind Energy Conversion System.....	481
<i>Shichang Zhou, Zhen Li, Haitao Li, Yuanxiang Sun, Qi Wang, Zhenbin Zhang</i>	
Partial Inertial Support for PV MPPT Systems Connected to Grid using the IPPLL Control Strategy .....	486
<i>Joan Rocabert, Jose I. Candela, Pablo A. Moreno, Andres Tarrasó, Juan Villon, Pedro Rodriguez</i>	
Enhanced Soft Start-Up Strategy of Dual Active Bridge Converter with Constant Current Stress and Dynamically Balanced Flux Linkage.....	492
<i>Yao Huang, Jingxin Hu, Jingyuan Wang, Yuying He, Fei Liu, Xinbo Ruan</i>	
A Comprehensive Strategy for Grid Forming Control in DC Coupled Photovoltaic and Battery Energy Storage Inverters .....	498
<i>Houshang S. Rizi, Zibo Chen, Alex Q. Huang, Pedro Rodriguez</i>	
Efficiency and Loss Analysis of a GaN HEMT Based Synchronous Buck Converter at 123 K - 298 K.....	504
<i>Zilong Chen, Yuqi Wei, Yanjie He, Peng Sun</i>	
Enhancing Grid Stability: A Frequency Regulation Control Strategy for BESS in Grid-Connected .....	510
<i>Juan Villón, Joan Rocabert, J. Ignacio Candela, P. Rodriguez</i>	
High-Frequency Effects on Magnetics and Converter Performance: Implications for Power Electronic Converter Design .....	516
<i>David A. P. Fernandez, Roderick A. G. Jimenez, Ahmed Rahouma, Juan C. Balda</i>	
Synchronisation, Dispatch and Droop of VSCs: Revisiting Functionality in Various Coordinate Systems.....	522
<i>Sjur Foyen, Chirag Shah, Chen Zhang, Marta Molinas</i>	
Reactive Power-Voltage Droop Design of Dispatchable Virtual Oscillator Control for Single-Phase Inverters.....	527
<i>Xiaomeng Shen, Hao Luo, Yinxiao Zhu, Yongheng Yang</i>	

A Low Cost Phase Estimation Device for PMU Phase Validation .....	533
<i>Manuel Pitz, Sriram K. Gurumurthy, Matthias M. Nowak, Stefan Lankes, Ferdinanda Ponci, Antonello Monti</i>	
Modified Sorting Algorithm for Fault-Tolerant Operation of Hybrid MMC with Hot Reserve Submodules .....	538
<i>Mahyar Hassanifar, Simona Ventura, Marius Langwasser, Davide D'Amato, Vito G. Monopoli, Marco Liserre</i>	
Fault Tolerant Control for Medium Voltage Hybrid MMC with Cold Reserve Submodules .....	544
<i>Mahyar Hassanifar, Simona Ventura, Marius Langwasser, Davide D'Amato, Vito G. Monopoli, Marco Liserre</i>	
Investigation of the Influence of the Dead-Time on the Performance of an LLC Resonant Converter for High-Power Application .....	550
<i>Samuel S. Queiroz, Levy F. Costa</i>	
A Bumpless Transition Strategy for Efficient Partial Shading Detection in PV Systems.....	556
<i>Afaq Hussain, M. J. Hossain, Ricardo P. Aguilera, Rodrigo C. Leiva</i>	
Challenges of Microgrid Stability Assessment in the Presence of Inverter-Based Resources.....	562
<i>Qing Lin, Rolando Burgos</i>	
Intelligent Junction Temperature Estimation of an IGBT using Machine Learning and $V_{ce}$ Measurement .....	567
<i>Venkata Y. Konda, Jun-Hyung Jung, Marco Liserre</i>	
Integration of Modular Energy Storage Solutions in the Distribution Grid.....	573
<i>Miguel Crespo, Carlos Gómez-Aleixandre, Gleisson Balen, Daniel Del Rivero, Angel Navarro-Rodriguez, Cristian Blanco, Pablo Garcia</i>	
Real-Time Cosimulation of Power Systems: Integration of eMEGASIM and ePHASORSIM using OPAL-RT Simulators.....	579
<i>Daniel Del Rivero, Shailendra Singh, Pablo García, Pedro Rodríguez</i>	
Forecasting Hybrid Renewable Power Generation in Luxembourg: A Comparative Study of Convolutional Neural Network's Application.....	585
<i>Vahid Arabzadeh, Raphaël Frank</i>	
Virtual Energy Storage Stacking in Day-Ahead and mFRR Markets - A Spanish Case Study.....	590
<i>Ángel Paredes, José A. Aguado, Pedro Rodríguez</i>	
Graph Neural Network Based Deep Reinforcement Learning for Volt-Var Control in Distribution Grids .....	596
<i>Aoxiang Ma, Jun Cao, Pedro R. Cortes</i>	
Emerging Trends and Challenges in Smart Power Distribution for Marine Transportation .....	601
<i>Sunny Sonandkar, Thanga R. Chelliah</i>	
Overview of Various Carbon Neutral Energy Storage Solutions, Supporting Grid Stability .....	606
<i>Yogesh Bornarkar, Vijay Mohale, James A. Adu</i>	
Current Sharing Control of Multiphase Interleaving Single Inductor Four Switch Buck-Boost Converter for Energy Storage System .....	612
<i>Aqeel U. Rahman, Filippo Pellitteri, Nicola Campagna, A. O. Di Tommaso, Rosario Miceli</i>	

Last Developments and New Technologies in Solid-State Transformer.....	618
<i>Marco Liserre, Levy Costa, Zhicheng Guo, Davide D'Amato, Samuel S. Queiroz, Alex Huang</i>	
Comparative Analysis of a Single-Phase Model Applicable to the Dual Active Bridge Converter.....	626
<i>Francisco Salazar-Figueroa, Andrés Escobar-Mejía, Mauricio Holguín-Londono</i>	
A Systematic Review of Solid-State Transformer for Large Ships and Their Shore Power Supply.....	631
<i>Muhammad U. Mutarraf, Qian Xun, Marius Langwasser, Marco Liserre</i>	
Synchronization Circuit Design for Battery Energy Storage Integration in DFIM-Based Hydro Power Systems .....	637
<i>Vishal Undre, Vijay Mohale, Thanga R. Chelliah, Yogesh V. Hote</i>	
An Optimized Electric Power and Reserves Economic Dispatch Algorithm for Isolated Systems Considering Water Inflow Management.....	643
<i>D. Ferreira-Martinez, Filipe T. Oliveira, F. J. Soares, C. L. Moreira, Rui Martins</i>	
Predicting Hydro Reservoir Inflows with AI Techniques using Radar Data and a Numerical Weather Prediction Model .....	649
<i>M. F. Almeida, F. J. Soares, F. T. Oliveira, J. T. Saraiva, Rui M. Pereira</i>	

#### **Author Index**