

2025 IEEE Workshop on Power Electronics and Power Quality Applications (PEPQA 2025)

**Cartagena, Colombia
4-6 June 2025**



**IEEE Catalog Number: CFP2542V-POD
ISBN: 979-8-3315-8518-1**

**Copyright © 2025 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:	CFP2542V-POD
ISBN (Print-On-Demand):	979-8-3315-8518-1
ISBN (Online):	979-8-3315-8517-4
ISSN:	2993-494X

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
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

TABLE OF CONTENTS

Frequency Measurement at PWM-Based Inverter Output in Steady State and Dynamic Conditions	1
<i>Elmer Sorrentino, Irene Conejo</i>	
Basic Analysis of an E-Scooter BLDC Motor from Experimental Measurements	6
<i>Elmer Sorrentino, Guillermo Suárez</i>	
Implementation of a Simulation Platform for Microgrids with Photovoltaic System Using an Embedded System	12
<i>Diego Santiago Jiménez-Beltrán, Alexander Díaz-Salazar, Oscar David Flórez-Cediel</i>	
Implementation of a Harmonics Loads Emulator Based on Embedded System	18
<i>Andrés Felipe Sierra-Acosta, Oscar David Flórez-Cediel, Oscar Danilo Montoya</i>	
Advancing Multi-Language Open-Source Digital Simulators for Covering the Power Industry Needs	23
<i>Davis Montenegro, Celso Rocha, Paulo Meira, Andres Ovalle, Ricardo Torquato, Gustavo Ramos</i>	
Energy Forecasting Trends in Microgrids	28
<i>Andrés C. Herrera, Jhonathan L. Clavijo, Jhonny Posada</i>	
Analysis of Connecting PV and ESS for Retired Landfill Microgrid	34
<i>Zhang Jian, Samuel Okhuegbe, Yayu Yang, Chong Shen, Naga Lakshmi Thotakura, Yilu Liu</i>	
Figure of Merit for Measuring Energy Efficiency in DBD Systems	38
<i>Sergio Perez Pesca, Rafael Diez, Wilmar Martinez</i>	
Harmonic Distortion Analysis and Mitigation in LED Public Lighting Systems Using PID Control and LC Filters	43
<i>Cristian Andrés Herrera Campo, Víctor Garrido-Arévalo, Edison Caicedo Peñaranda, Pedro Julian García Guarín</i>	
Harmonic Characterization and Mitigation Strategies for PV-Integrated Distribution Systems: IEEE Std 519-1992 Compliance	47
<i>Juan A. Eslava Tovar, Gustavo Ramos, David Celeita, Payman Dehghanian</i>	
Bipolar Voltage Power Supply for Parallel Plate Dielectric Barrier Discharge Systems	53
<i>Camilo Sanabria, Rafael Diez, David Florez, Hubert Piquet</i>	
Control Design Guidelines for Current-Mode Modular Multilevel Matrix Converters Based on Dynamic Modeling and Stability Analysis	59
<i>Rafael Castillo-Sierra, Giri Venkataramanan, Dionisio Ramirez</i>	
A Proposal for an Educational Platform in Microgrids and Power Electronics Leveraging PHIL	67
<i>Julian David Ontibon Velasquez, Guillermo Andres Jimenez Estevez</i>	
Design and Implementation of a Micro-Hydroelectric Plant in the Banana-growing Area of Colombia	73
<i>D. Quintero-Palacio, J.J. Osorio, S. Arias-Guzman, A.J. Ustariz-Farfan, E.A. Cano-Plata</i>	
Harmonic Mitigation in Industrial Power Systems Using K-Rated Transformers: An Alternative to Active Filters	81
<i>Gustavo Ramos, Oscar Rivera, Rodrigo Ruiz, Miguel Aldrete</i>	

An Optimal IDA-PBC-Based Adaptive Speed Control Design for a DC Motor Using a Buck Converter.....	87
<i>Oscar Danilo Montoya, Walter Gil-González, Gerardo Espinosa-Pérez</i>	
Adaptive Speed Control for DC Motor Using Boost Converter: IDA-PBC Approach	93
<i>Oscar Danilo Montoya, Walter Gil-González, Gerardo Espinosa-Pérez</i>	
Convex Approximation for Economic-Environmental Dispatch of Thermal Power Plants with Transmission System Integration	99
<i>Oscar Danilo Montoya, Walter Gil-González, Joao Soares</i>	
Challenges of Power Systems with IBR-Dominated in Specific Regions: Analysis of Transient Stability and SCR	104
<i>Kevin S. Santamaria, Mario A. Rios</i>	
Optimizing Electric Vehicle Consumption Models Using Genetic Algorithms: Real-World Case Study.....	110
<i>Daniele Martini, Seyed Mahdi Miraftebadeh, Michela Longo, Sonia Leva</i>	
Comprehensive Assessment of Power Quality Problems in Industry	116
<i>Eliana Noriega Angarita, Vladimir Sousa Santos, Pablo Daniel Donolo, Enrique Ciro Quispe</i>	
Pulsar Movement Animation and Its Corresponding Signal Visualization for Timing Source.....	122
<i>Yongxin Zhang, Yuru Wu, Yu Liu, Jiahui Yang, Naga Lakshmi Thotakura, Yilu Liu</i>	

Author Index