

2023 14th Power Electronics, Drive Systems, and Technologies Conference (PEDSTC 2023)

Babol, Iran

31 January - 2 February 2023



IEEE Catalog Number: CFP2311J-POD
ISBN: 979-8-3503-3665-8

**Copyright © 2023 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:	CFP2311J-POD
ISBN (Print-On-Demand):	979-8-3503-3665-8
ISBN (Online):	979-8-3503-3664-1

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

A Multiphase Voltage Multiplier Circuit with Interleaved Boost Converter	1
<i>Amirhasan Babanezhad, Reza Beiranvand</i>	
High Step Down/Step Up Full Soft Switching Bidirectional DC-DC Converter Without Auxiliary Switches	7
<i>Mohamadreza Kholousi, Mohamadmehdi Elhami, Sajjad Tohidi</i>	
A New Approach to Control Transmission Power from Renewable Energy Resources to the Grid Side Via Hybrid DC/DC/AC Converter.....	13
<i>Ramin Alizadeh Asl, Amin Alizadeh Asl</i>	
Sensorless Control of a Surface-Mounted PMSM by an Improved Flux Observer with RLS Parameter Identification Method	21
<i>Ali Yousefi Darani, Behzad Mirzaeian Dehkordi</i>	
A High-Voltage Gain DC/DC Resonant SC Converter for High-Power and Wide Input Voltage and Load Variation Ranges Applications	28
<i>Sajad Afshar Zarandi, Reza Beiranvand</i>	
Balancing of Capacitor Voltages with a Reduced Number of Voltage and Current Sensors in Alternate Arm Multilevel Converter (AAMC).....	34
<i>M. Bagheri Hashkavayi, S. Masoud Barakati, M. Rahmani Haredasht, Vahid Barahouei, S. Hamed Torabi</i>	
A New Non-Isolated High Step-Up DC-DC Converter Suitable for Renewable Energy Applications	39
<i>Amin Alizadeh Asl, Ramin Alizadeh Asl, Seyed Hossein Hosseini</i>	
Model Predictive Control of a Single Stage Power Factor Correction for Inductive Power Transfer Systems.....	44
<i>Sina Navaiyan-Kalat, Sadegh Vaez-Zadeh, Amir Babaki, Maryam Pakzaban</i>	
Optimization and Improvement of Reduced Ferrite DWPT Magnetic Link Structure with New Passive Reflection Windings Topology	50
<i>Maryam Pakzaban, Sadegh Vaez-Zadeh, Sina Navaiyan-Kalat</i>	
Fault-Tolerant Operation Approach for Nested Neutral Point Clamp (NNPC) Converter	56
<i>Vahid Barahouei, S. Masoud Barakati, M. Rahmani Haredasht, M. Bagheri Hashkavayi, Mahsa Zoraghi Jedi</i>	
Small-Signal Modeling of a Resonant SCC for PWM, Phase-Shifted and Frequency Modulation Control Approaches	61
<i>Sajad Afsharzarandi, Reza Beiranvand</i>	
Current-Based Fault Detection of Photovoltaic Systems.....	67
<i>Nima Pourshahbaz, Aref Eskandari, Jafar Milimonfared, Mohammadreza Aghaei</i>	
An Adaptive Technique of MPPT for PV Array Under Partial and Dynamic Shading Conditions	73
<i>Amirhossien Kouchaki, Aref Eskandari, Jafar Milimonfared, Mohammadreza Aghaei</i>	
An Extendable Voltage Multiplier Based Multi-Input DC/DC Converter with Soft-Switching Operation.....	79
<i>Koosha Choobdari Omran, Reza Beiranvand</i>	

Photovoltaic Grid-Tied VSI Control Considering Parameter Uncertainty Based on DOB	85
<i>SM. Mousavi Ghahfarokhi, MS. Golsorkhi Esfahani, M. Hajian</i>	
Improved Commutation in Sensorless Control of Brushless DC Motors by Index Pulse Comparison	90
<i>Amirhossein Ramezankhani, Davood Arab Khaburi, Milad Bagheri Sadr, Farzad Bodaghi, Mohammad Reza Arabshahi, Jose Rodriguez</i>	
Optimum Efficiency and Maximum Possible Power Transfer Analysis of Double-Vehicle Wireless Charging System	95
<i>Seyyed Hossein Mousavi, Sadegh Vaez-Zadeh, Amir Babaki</i>	
Investigation of Broadband Excitation Signals for Online Battery Impedance Spectroscopy and Model Identification	102
<i>Hossein Haji Abbasali, Shahin Jafarabadi Ashtiani</i>	
A Novel Continuous Input Current High Step Up DC-DC Converter for Low Level DC Voltage Resource Applications	107
<i>Farid Barmoudeh, Ahmad Salemnia</i>	
Analysis of a Double Stator Flux Reversal Permanent Magnet Machine with Halbach Array Magnets	112
<i>Behzad Aslani, S. A. Gholamian, Seyed Ehsan Abdollahi</i>	
Study of an Improved Yoke Permanent Magnet Motor with Booster Magnets Between Stator Modules	118
<i>Mohammad Amirkhani, Mojtaba Mirsalim</i>	
Robust Synchronizing Method for Unbalanced Weak Grid Connected Converters with High Power Quality	123
<i>Pooriya Jamallo, Sadegh Vaez-Zadeh, Alireza Jabbarnejad</i>	
A Bidirectional Transformerless Direct Ac-Ac Converter for Improved Power Quality	128
<i>Seyed Mohsen Mortazavi, Reza Beiranvand</i>	
Fault Diagnosis of a Stand-Alone Wind System Using Supervised Learning Methods	133
<i>Hamed Mohammadkazemi, Rasool Peykarporsan, Ebrahim Afjei</i>	
On the Effect of Parasitic Capacitances on the Voltage Sharing of Series-Connected Diodes	138
<i>Alireza Ghaderi, Amir Azam Rajabian, Sadegh Mohsenzade</i>	
Torque Ripple Reduction and Radial Force Mitigation in the Switched Reluctance Motor Using a Novel Rotor Configuration	143
<i>Alireza Sohrabzadeh, Hossein Torkaman, Ebrahim Afjei</i>	
Multi-Objective Optimization of an Axial-Flux Magnetic Gear Using Taguchi Method	147
<i>Mahdi Abolghasemi, Aghil Ghaheri, Sadegh Mollaei Saghin, Seyyed Ebrahim Afjei</i>	
Performance Investigation and Improvement of a Double-Layer Outer Rotor Consequent-Pole Permanent Magnet Motor	155
<i>Mohammadreza Naeimi, Karim Abbaszadeh, Johan Gyselinck</i>	
Maximum Power Point Tracking-Based Control Strategy for PMSG Wind Energy Conversion System Using a Combined Fuzzy-Model Predictive Controller	160
<i>Ehsan Akbari, Milad Samady Shadlu</i>	

Evaluation of Turning On/Off Delay Time Interval as a Precursor for IGBTs Gate Oxide Degradation	166
<i>Mojtaba Jazayeri, Sadegh Mohsenzade</i>	
A Bidirectional CLLC Resonant Converter for EV Battery Charger Applications	171
<i>Reza Takarli, Mohammadreza Adib, Abolfazl Vahedi, Reza Beiranvand</i>	
Influence of Different Rotor Positions on the Performance of a Coreless Axial-Flux Generator.....	177
<i>Omid Aghapour, Milad Niaz Azari, Seyyed Mehdi Mirimani</i>	
L-Type Modular Outer-Rotor Consequent-Pole Motor with Low Torque Ripple and High Permanent Magnet Utilization Ratio	182
<i>Mohammadreza Naeimi, Karim Abbaszadeh, Johan Gyselinck</i>	
A Wide Input Range Two-Channel Interleaving Boost PFC Rectifier with High DC Bus Voltage and Small Inductors.....	187
<i>Amir M. Kamalkhani, Reza Asgarniya, Ebrahim Afjei</i>	
MRAS Sensorless Control of the SynRM Based on a Simplified Finite Position Set Algorithm	194
<i>S. Rasul Eftekhari, Ali Mosallanejad, Hamidreza Pairo</i>	
A Single Switch Common-Ground Ultra-High Gain Non-Isolated DC-DC Converter.....	200
<i>Saeed Mahdizadeh, Maryam Tarighat Monfared, Seyed Erfan Fazeli, Mohammad Tavakoli Bina</i>	
A High Step-Up Converter with Continuous Input Current and Auxiliary Circuit to Realize Soft-Switching Performance	205
<i>Marzieh Mohammadi Jouzdani, Mahdi Shaneh, Tohid Nouri, Hamid Saeidi</i>	
A Step-Up DC-DC Converter with High Voltage Gain and Eliminated Right Half Plane Zero.....	210
<i>Seyed Mohsen Salehi, Ali Yazdian</i>	
Low-Voltage Stress CI-Based Quadratic Boost Converter for Distributed Energy Resources.....	216
<i>Morteza Dezhbord, Milad Babalou, Sobhan Mohamadian, Carlo Cecati</i>	
Model Predictive Control of Alternate Arm Converter with a Short-Overlap Period Under Steady-State and Transient Conditions	222
<i>Ehsan Akbari, Milad Samady Shadlu</i>	
Power Loss Reduction Using SOS Algorithm in SEPIC LED Drive	229
<i>S. R. Movahhed Ghodsinya, Ehsan Azimirad, Ali Mahmoodi, Mohamadreza Mehrabi</i>	
Controllable DC Fault Current Limiter with Loss Reduction	235
<i>Alireza Jafari, Sadegh Mohsenzade, Ali A. Razi-Kazemi</i>	
Analysis, Modeling, and Simulation of a PM Linear Actuator with Surface Motion Ability.....	240
<i>Saeed Hasanzadeh, Hamidreza Besharatifard</i>	
Improved Half-Bridge Switched Boost Inverter.....	246
<i>Asghar Bahador, Ebrahim Babaei, S. M. J. Mousavi, Darioush Alizadeh</i>	
Comparison and Performance Analysis of IPM, SynRM and Flux-Intensifying IPM Machines	252
<i>Amir Hosein Amiri, Rouholla Rouhani, Seyed Ehsan Abdollahi, Saeed Hasanzadeh</i>	
Novel Symmetric Hybrid Multilevel Inverter with Reduced Switch Count and Low Blocked Voltage by Power Transistors	258
<i>Mohammad Hamidi, Mohsen Hamzeh</i>	

Online Inductance Estimation of PM-Assisted Synchronous Reluctance Motor Using Artificial Neural Network	264
<i>Ahmadreza Karami-Shahnani, Hossein Dehghan-Niri, Reza Nasiri-Zarandi, Karim Abbaszadeh, Mohammad Sedigh Toulabi</i>	
Magnetizing Curve Identification of Induction Motor for Drive Application Considering the Inverter Nonlinearity	270
<i>Behnam Nikmaram, Mahdi S. Mousavi, Mousa Abbasi, Rasool Yousefi, Mehdi Fazeli</i>	
A Comparative Study of E-Type and C-Type Hybrid Reluctance Motors.....	276
<i>Ehsan Farmahini Farahani, Mojtaba Mirsalim</i>	
Effect of Slot/Pole Combination on the Performance of Complementary-Rotor Doubly Salient Permanent Magnet Motors	281
<i>Mohammad Afrank, Mohammad Amirkhani, Mojtaba Mirsalim</i>	
An Improved High Step-Up Non Isolated DC-DC Converter: Steady-State Analysis, Design and Simulation	287
<i>Fatemeh Falahi, Hesamodin Allahyari, Ebrahim Babaei</i>	
An Isolated High-Efficient Impedance-Source AC-AC Converter with Extended Buck-Boost Operation for DVR Application	293
<i>Iman Abdoli, Ali Mosallanejad</i>	
Hardware-Based Fault-Tolerant Technique for Modular Multilevel Converter Based on Shifting Submodules Between Legs.....	299
<i>Mehdi Khaleghi, Ali Haji Ali Biglo</i>	
Virtual Impedance Compensator-Based Control Strategy with Feedback Linearization for MMC-Based HVDC System	305
<i>Erfan Azimi, Saeed Hosseinnataj, Aliakbar Tavasoli, Majid Mehrasa, Jafar Adabi</i>	
Bidirectional DISO DC-DC Converter Based on Lyapunov Control Strategy.....	311
<i>Saeed Hosseinnataj, Morad Yazdani, Morteza Shekari, Mehran Jani, Jafar Adabi</i>	
ZVT Interleaved High Step-Up Converter for Renewable Energy Systems	316
<i>Baharak Akhlaghi, Hosein Farzanehfard, Dhananjay Thiruvady, Rasoul Faraji, Fatemeh Shiri</i>	
Ultra-High Step-Up Soft Switched Quadratic DC-DC Converter with Continuous Input Current and Low Switch Voltage Stress	322
<i>Maryam Hajilou, Shirzad Gholami, Hosein Farzanehfard</i>	
A Single-Switch Ultra-High Step-Up DC-DC Converter with Low Voltage Stress Based on Quadratic Y-Sources Topology	329
<i>Ali Masoud, Mohsen Packnezhad, Hosein Farzanehfard</i>	
Using a High Frequency LC Resonant Inverter for Ultrasonic Cleaning Applications.....	335
<i>Zahra Asemi, Reza Beiranvand</i>	
An Improved Bidirectional Non-Isolated Dual-Input DC-DC Converter for Electric Vehicles Application.....	341
<i>Soroush Naeiji, Seyed Ehsan Abdollahi, Seyed Reza Abdollahi, Barmak Baigzadehnoe</i>	
Integrated Dual Static Var Compensators to Reduce Railway Power Quality Conditioner Volt-Ampere Rating in Co-Phase V/V Traction System.....	348
<i>Mohammad Habibolahzadeh, Alireza Jalilian</i>	

AC Fault Ride-Through Strategy for MMC-Based HVDC Systems with Short Lines	354
<i>Seyedfarhan Hosseinikordkheili, Mohsen Hamzeh</i>	
Design of an In-Wheel Rotor Permanent Magnet Flux Switching Motor for Electric Bicycle	360
<i>Amirhussein Zia, Seyedarmin Mirnikjoo, Seyed Ehsan Abdollahi</i>	
Dual-Input, Single-Output Step-Up DC/DC Power Electronic Interface for Energy Harvesting Systems.....	367
<i>Safa Mashali, Ali Yazdian Varjani</i>	
Family of High Step-Up Multi-Input Converters with Continuous Battery Current Based on Three Port Boost Topology and Switched Capacitors	372
<i>Erfan Meshkati, Hosein Farzanehfard</i>	
Sensorless Speed Control of SPMSM Using Disturbance Rejection Predictive Functional Control	379
<i>Ahmadreza Karami-Shahnani, Hossein Dehghan-Niri, Karim Abbaszadeh, Reza Nasiri-Zarandi, Mohammad Sedigh Toulabi</i>	
Magneto-Thermal Analysis of a Novel Excited Outer Rotor Flux-Switching PM Machine	385
<i>Ali Zarghani, Sadegh Mollaei Saghin, Aghil Ghaheri, Ebrahim Afjei, Hossein Torkaman</i>	
Performance Optimization of Excited Outer Rotor Segmented-FSPM Motor Based on Taguchi Method	391
<i>Sadegh Mollaei Saghin, Aghil Ghaheri, Mahdi Abolghasemi, Ebrahim Afjei</i>	
A Soft Switching Three-Phase Current-Fed Bidirectional Converter with Low Input Current Ripple for Energy Storage System Applications	396
<i>Masood Soleimanifard, Javad Mozayan</i>	
Multi-Port Dual-Active-Bridge DC-DC Converter for Bi-Polar DC Microgrid Application Using Buck-Boost Voltage Balancer.....	402
<i>Amir Abbas Aghajani, Mojtaba Eldoromi, Barman Nakhaei, Ali Akbar Moti Birjandi</i>	
Using Three-Dimensional Virtual Voltage Vector in Predictive Current Control of a Four-Leg Inverter for Fixing Common-Mode Voltage.....	407
<i>Majid Akbari, S. Alireza Davari, Reza Ghandehari, Freddy Flores-Bahamonde, Jose Rodriguez</i>	
A New 8/14 Two-Phase Switched Reluctance Motor with Improved Performance	414
<i>Gholamreza Davarpanah, Hossein Shirzad, Jawad Faiz</i>	
A New Combination of Stator and Rotor Poles of Three-Phase Switched Reluctance Motor for Improved Performance	420
<i>Gholamreza Davarpanah, Hossein Shirzad, Jawad Faiz</i>	
Proposing a Low Frequency Control Method for Three-Phase Four-Leg Inverters to Feed Nonlinear and Unbalance Loads	427
<i>Shamim Mohammadzadeh, Hoda Ghoreishy, Mohammad Rezanejad</i>	
Stability Analysis of Variable Frequency Control Method of Soft Switching for Boost Converter with Wide Bandgap Semiconductors.....	433
<i>Solmaz Norouzi, Hoda Ghoreishy, Ahmad Ale Ahmad, Farzad Tahami</i>	
Extended Model of PM-Assisted Synchronous Reluctance Motor Including Torque Fluctuation	440
<i>Hossein Dehghan-Niri, Ahmadreza Karami-Shahnani, Karim Abbaszadeh, Reza Nasiri-Zarandi, Mohammad Sedigh Toulabi</i>	

Partly Isolated Symmetrical Six-Phase Induction Motor Drive System Based on Conventional Three-Phase Transformer	445
<i>Hadi Aghaei, Ebrahim Babaei, Mohammad Bagher Bannae Sharifian, Ibrahim Shoghli</i>	
A 24/28-Pole Hybrid Reluctance Motor with U-Core Stator.....	450
<i>Vahid Mirzaei, Mojtaba Mirsalim</i>	
Studying of Interlinking Converter for Appropriate Power Sharing in Hybrid AC/DC Microgrids.....	455
<i>Mojtaba Eldoromi, Ali Akbar Moti Birjandi, Nima Mahdian Dehkordi</i>	
Predictive Torque Control Using a Simplified Algorithm to Maximize Adhesion Force in Railway Applications.....	460
<i>Amin Hassanzadeh, Ali Akbar Emarloo, Behnam Nikmaram, Mehdi Fazeli</i>	
A Rule-Based Energy Management Strategy with Current Estimation for Controlling Grid Connected Hybrid Energy Storage System	466
<i>Ehsan Farrokhi, Pouria Safari, Hoda Ghoreishy</i>	
An Investigation on Selecting of Resonant Inverter Topologies for Efficient Wireless Power Transmission.....	473
<i>Rasoul Kamali, Sayyed Asghar Gholamian, Seyed Reza Abdollahi</i>	
A Quadratic High Gain DC-DC Converter with Continuous Input Current for PV Applications	479
<i>Hamed Arvani, Ali Sajjadi, Mohammad Kalamialhashem, Mohsen Hamzeh</i>	
A Modified MPPT-Based Model Predictive Control for a Single-Stage Modular Multilevel Converter in Grid-Connected Photovoltaic Applications	485
<i>Ehsan Akbari, Milad Samady Shadlu</i>	
A Low-Ripple High-Voltage DC Power Supply Using a Switching Ripple Compensation Unit.....	491
<i>Abbas Sheikhi Azizi, Shahriyar Kaboli</i>	
Fault Detection in Variable Air-Gap Resolver	497
<i>H. Lasjerdi, Z. Nasiri-Gheidari</i>	
Flexible Control of the Interline DC Power Flow Controller Using Virtual Capacitor in VSC-HVDC Grids.....	502
<i>Mirhamed Pourmirasghariyan, Mirsajed Pourmirasghariyan, Seyed Saeid Heidari Yazdi, Seyyed Yousef Mousazadeh Mousavi, Kumars Rouzbehi, G. B. Gharehpetian</i>	
A Novel Approach for Improving the LCC Resonant Converter Efficiency Over Wide Load Variation Ranges.....	508
<i>Jasem Shahsevani, Reza Beiranvand</i>	
Effects of Multi-Phasing on the Performance of Flux-Intensifying IPM Machines	515
<i>Amir Hosein Amiri, Rouholla Rouhani, Seyed Ehsan Abdollahi, Saeed Hasanzadeh</i>	
Collaborative Electric Vehicle Charging Strategy with Regenerative Braking Energy of Railway Systems in Park & Ride Areas.....	522
<i>Mostafa Golnargesi, Hamed Jafari Kaleybar, Morris Brenna, Dario Zaninelli</i>	
The Potential Impacts of Wireless Power Transfer on the Global Economy, Society, and Environment	527
<i>S M Shakil, Muhammad H Rashid</i>	

A DC Side Sensorless Single-Phase Shunt Active Power Filter with a Second Order Sliding Mode Control and Unbalance Loads	532
<i>Farzaneh Bagheri, Samet Biricik, Hasan Komurcugil</i>	

Leakage Current Reduction in Four-Leg Inverter Utilizing Three-Dimensional Virtual Voltage Vector-Based Predictive Control	537
<i>Majid Akbari, S. Alireza Davari, Reza Ghandehari, Freddy Flores-Bahamonde, Jose Rodriguez</i>	

Author Index