

2021 12th Power Electronics, Drive Systems, and Technologies Conference (PEDSTC 2021)

**Tabriz, Iran
2-4 February 2021**



**IEEE Catalog Number: CFP2111J-POD
ISBN: 978-1-6654-4772-0**

**Copyright © 2021 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:	CFP2111J-POD
ISBN (Print-On-Demand):	978-1-6654-4772-0
ISBN (Online):	978-1-6654-0366-5

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 Content

A New Topology of High Step-Up Non-Isolated DC-DC Converter with Modifying in VMC.....	1
MPPT Controller Design Using TLBO Algorithm for Photovoltaic Systems Under Partial Shading Conditions.....	6
Hybrid Control for a Boost DC-DC Converter with Average Dwell Time	11
Design and Implementation of a Transformerless High Step-Up DC-DC Converter Based on Conventional Boost Converter and Voltage Multiplier Cells	16
Hyper-Plane Sliding Mode Control of Non-Minimum Phase Grid-Connected Zeta Converter.....	21
Full Soft-Switching Ultra-High Gain DC/DC Converter Using Three-Winding Coupled-Inductor	26
Single-Phase Dynamic Voltage Restorer Based on AC-AC Trans-Z-Source Converter for Voltage Sag and Swell Mitigation.....	33
Improved Model Predictive Control Methods with Natural Capacitor Voltage Balancing for the Four Level-Single Flying Capacitor (4L-SFC) Inverter	39
Single-Phase Two-Stage Transformerless Grid-Connected Inverter for Photovoltaic Applications.....	45
Common Grounded High step up Z-Source DC-DC Converter with Coupled Inductors	50
A Non-isolated High Step-Up DC-DC Converter Recommended for Photovoltaic Systems	55
Emulation of Direct-Drive Wind Energy Conversion Systems Based on Permanent Magnet Synchronous Generators.....	60
A Deadbeat Controller Design for Single-Phase Active Power Filters Based on Forward-Backward Discretization	65
New Single-Switch Non-isolated Boost DC-DC Converter with Free Input Current Ripple.....	70
A Quadratic High Step-up DC-DC Boost Converter Based on Coupled inductor with Single Switch and Continuous Input Current	74
Hybrid Switched-Capacitor 9-Level Boost Inverter	80

A Non-Isolated Bidirectional DC-DC Converter with Wide Voltage Conversion Ratio and Soft-Switching Capability.....	84
Performance Improvement of Model Predictive Control for Modular Multilevel Converters by Auto-regulating the Weighting Factor Value.....	90
Modeling of Linear Switched Reluctance Motors Using Fuzzy Clustering Method.....	95
Stabilization of DC/DC Converter with Constant Power Load using Exact Feedback Linearization Method based on Backstepping Sliding Mode Control and Nonlinear Disturbance Observer	101
Event-Triggered Fully-Distributed Secondary Control of Islanded DC Microgrids Using Pre-defined Event Condition	107
A Bridgeless Soft Switching PFC AC/DC Converter with Active Clamping Auxiliary Circuit.....	112
A Three-Winding Coupled-Inductor High Step-Up Boost Converter with an Active-Clamp Circuit.....	118
A New High Step-Up Interleaved LLC Converter	123
Model-Free Finite Set Predictive Voltage Control of Induction Motor.....	129
Selective Utilized Phase Number of Multiphase Induction Motors Strategy to Enhance Electric Vehicles' Drive Range	134
Performance Analyses of a Three-Port Converter for Post-Fault Conditions in Aerospace Applications	139
A Dual Active Bridge Converter with Full ZVS Range Using a Buck-Boost Converter.....	145
A Boost Switched-Capacitor Multilevel Inverter Using Quasi-Resonant Inductor.....	150
Design and Analysis of a New Multilevel Inverter with Reduced Number of Switching Devices	156
A new Resonant Domestic Induction Heating converter with High Power Conversion Efficiency.....	161
A Localized-Protection Scheme for Ring DC Microgrids using Distribution-Sensitive Poverty Index..	167
Optimal Design of a Permanent Magnet Synchronous Motor Using the Cultural Algorithm.....	172
A Model Predictive Control for a Four-Leg Inverter in a Stand-Alone Microgrid under Unbalanced Condition	177

Multi-Objective Optimization of Permanent Magnet Synchronous Motor Based on Sensitivity Analysis and Latin Hypercube Sampling assisted NSGAI	182
A Single-Phase Wireless Power Transfer System with a High-Frequency AC Link Converter in the Secondary for Three-Phase Applications	187
Double-Input/Single-Output Zeta Converter	192
Modeling and Simulation of Dual Z-source based Hybrid 2/3 Level Inverter	197
Multi-objective Optimization of a Permanent Magnet Synchronous Motor for Gearless Elevator	204
Investigations of Magnet Shape Impacts on Coreless Axial-Flux PM Machine Performances	210
Computation Reduction for Balancing the Voltages of the DC-link Capacitors in 3-level Inverter by Using Redundant Switching States	215
Private Investors Participation in Long-Term Distribution Network Planning	221
A Study on Applying Interleaved Switching Pattern on a Double-Input/Single-Output Zeta Converter	226
Maximum Power Per Current Control for Dynamic WPT Systems	231
Model-Free Predictive Combined Control for Three-Phase Grid Connected Voltage Source Converters	236
A Multilevel Converter Based on Cascaded Flying Cells with High Modularity and Single DC-link per Phase	241
ZVT Flyback with an Active Auxiliary Circuit	247
A Novel Zero Voltage Transition soft-switching PWM Boost Converter with low voltage stress	252
Bridgeless High Voltage Gain Active PFC Rectifiers with Positive/Negative Output and Low Semiconductor Count	257
Using Grid Connected PUC Inverter with Robust Control Against Hybrid DG's Oscillation	262
A Modular Two-Stage High Step-Down DC-DC Converter Using Frequency Multiplier Circuit for Datacenter Applications	267
A Soft Switching Interleaved High Step-down Converter with Low Voltage Stress	272

Nested Neutral Point Clamped Converter Based DSTATCOM with Mixed-Sequence Reactive Current Compensation Capability.....	278
Delay and General Multiplicative Noise-Resilient Secondary Frequency and Voltage Control for an Autonomous Microgrid.....	284
High Step up Switched-Capacitor Quasi-Switched Boost Inverters.....	290
Design Optimization of Tubular Linear Induction Motor Using Genetic Algorithm and Response Surface Methodology.....	296
Virtual Voltage Vector Based Predictive Control of High Performance Modified Quasi-Z-Source Inverter with the Aim of Constant Common-Mode Voltage.....	301
An H-Bridge Based Switched-Capacitor Boost Multi-Level Inverter.....	307
Voltage Balancing of Capacitors Using Kalman Filter in Modular Multilevel Converters without Current Sensors.....	311
A New Non-Isolated Single Switch High Step-up DC/DC Converter Based on Inductor Cells.....	316
Improved Indirect Model Predictive Control for Modular Multilevel Converter.....	321
Wireless Power Transfer System for Unmanned Aerial Vehicle.....	326
Novel switched-capacitor-based multilevel inverter topology for renewable energy.....	331
A New High Conversion Ratio Transformerless Buck-Boost Converter with Continuous Input Current.....	336
A Thirteen-Level Flying Capacitor based Single-Phase Inverter with Self-Balancing Capability.....	343
Estimation of CM Parasitic Capacitances in Front-end LLC Resonant DC-DC Converters.....	348
Static Eccentricity Fault Detection in Salient and Non-Salient Synchronous Generators Using Harmonic Components.....	353
Simple Innovative Method for Online Condition Monitoring of IGBTs in Back-to-Back Converters....	358
A Space Vector Modulation based Model Predictive Control for Low Frequency Operation of Nested Piloted NPC.....	363

Improvement of the Railway Power Flow Controller’s Performance Using Sliding Mode Control Method	369
Comparison Study of Active Flux based Sliding-Mode Observer and PLL based Sliding-Mode Observer Sensorless Control of SynRM.....	375
Application of Online Empirical Mode Decomposition and Continuous Wavelet Transform for Power Smoothing in Low voltage Microgrid with Battery Energy Storage System	382
Design and Comparative Finite Element and Thermal Analysis of 1-Phase Cylindrical Transformer for Low-Power Applications	387
Compatibility of Present 3kV DC and 2×25 kV AC High-Speed Railway Power Supply Systems Towards Future MVDC System	392
A Common Ground Transformer-less High Gain DC-DC Buck-Boost Converter	398
Single Switch ZVS Transformerless Resonant High Step-up Converter.....	404
State-of-Charge Estimation of NMC-based Li-ion Battery Based on Continuous Transfer Function Model and Extended Kalman Filter	410
Three-Phase Modular PFC Converter in Continuous Conduction Mode	415
A Multiport Isolated DC-DC Converter for Plug-in Electric Vehicles Based on Combination of Photovoltaic Systems and Power Grid.....	420
A Single Switch High Voltage Gain DC-DC Converter Based on Coupled Inductor and Switched-Capacitor for Renewable Energy Systems	425
Half-Bridge Trans-Z-Source Inverter with Continuous Input Current	431
Direct Thrust Force Control (DTFC) of Optimized Linear Induction Motor with Super Twisting Sliding Mode Controller (STSMC).....	437
Staircase Selective Harmonic Elimination in Multilevel Inverters to Achieve Wide Output Voltage Range	442
Sensorless Flying Start Method for Starting of Induction Motors.....	448
Hamiltonian Energy-Based Sliding Mode Control Approach for a Multi-port Bidirectional EV Charger via Zero Dynamic	453

A Non-isolated High Step-up Soft Switching DC to DC Converter with Continues input Current and Low Switch Voltage Stress	459
Transformerless Grid-Connected Asymmetric PV Inverter with Constant CMV and Reactive Power Injection Capability.....	465
Performance Improvement of Photovoltaic Emulator Using Lambert W Model and Fractional Order PI Controller	470
A Continuous Input Current DC-DC Converter Based on Coupled Inductor for Renewable Energy Applications	475
Developed Experimental Analysis of Current THD of The CPV System Using Continuous Input-current Buck-Boost DC-DC Converter	480
Harmonic Reduction by Voltage Reinjection Strategy in 12-Pulse VSI for High Power Applications ...	485
A Dual Switch/Inductor Isolated High Voltage Gain Based on Voltage Lift.....	491
Operation of the AC-AC Converter Based Dynamic Voltage Restorer in Weak Distribution Systems...	496
Examination and Comparison of Thyristor and Gate-Controlled Series Capacitors Performance for the Voltage Stabilization of Sensitive Loads	501
A Hybrid Control Approach for LLC Resonant Converter	506
A Comprehensive Analysis and Modeling of The Bidirectional Three-Level DC-DC Converter with Auxiliary Control Scheme for Balancing Voltages of Its Capacitors	512
Design and Analysis of an Isolated Single-Stage Resonant AC-DC Converter with PFC	519
A New Hybrid Three-Phase Multilevel Inverter Devoted to Electric Drive with Constant Volt per Hertz Control	524
Implementation of Burp Pulse Charging in Inductive Power Transfer Systems with LCC-Series Compensating Topology for Electric Vehicle Charger Application.....	530
Robust Design of BLDC Motor for Jetboard Application.....	537
A Primary Side CCS-MPC Controller for Constant Current/Voltage Charging Operation of Series-Series Compensated Wireless Power Transfer Systems.....	541

Convertor Mechanism Scheduling by Type-2 Fuzzy Approach for PV/Battery/Fuel Systems.....	546
Analysis and Investigation of a Soft-Switched Synchronous Buck Converter.....	551
A New MPC-based Approach for Torque Ripple Reduction in BLDC Motor Drive.....	556
Robust Torque Control of Induction Motor Using STSM Control.....	562
Grid Synchronization of Bidirectional Electric Vehicle Chargers Using Second Order Generalized Integrator based Phase Lock Loop.....	568
Performance Improvement of Control System for Wireless Charging of Electric Vehicle.....	573
Analysis of a High-efficient Step-Up Converter with ZVS Operation.....	578
Single Phase Active Power Filter Control Under Distorted Grid Voltage Using Quasi Open-Loop Grid-Synchronization Technique.....	584
A Novel Boost Fifteen-Level Asymmetrical Flying-Capacitor Inverter with Natural Balancing of Capacitor Voltages.....	589
Optimal Placement and Sizing of Energy-related Devices in Microgrids Using Grasshopper Optimization Algorithm.....	594
A Single-Switch Quadratic Boost with Stacked Zeta Converter.....	598
Proposing an Effective Armature Winding for a Small DC Motor using Sensitivity Analysis Based Algorithm.....	604
A Hybrid SMC Strategy for Sequential Switching Shunt Regulator.....	609
DC Voltage Drop Compensation in Automotive Drives by Finite Set Model Predictive Control.....	614
Estimation of Batteries Voltages and Resistances in Modular Multilevel Converter with Half-Bridge Modules Using Modified PSO Algorithm.....	619
Adapting Digital Twin Technology in Electric Railway Power Systems.....	626
A Wide Soft Switching Range Power Factor Correction Converter.....	632
A Novel SEPIC-Based Quasi-Resonant High Step-up DC/DC Converter with Soft-Switching.....	636

A 9-Switch 3-Level VSI-Based MPSC of PMSM Without Weighting Factors	643
More Electric Aircraft Fault Current Protection: A Review	648
Impact of Wind Turbines on Voltage Stability of Power Systems: Assessment and Improvement	655
A Comprehensive Analysis of a Complementary-Rotor Doubly Salient Permanent Magnet Motor for High Torque Applications.....	662
A New Multilevel Inverter: An Attempt to Reduce Power Components	667
A New High Step-Up DC-DC Converter Based on Impedance Network	673
A Two-Phase Hybrid Switched-Inductor DC-DC Converter with High Voltage Conversion Ratio.....	678
A Novel H-Type MLI with the reduction in Power Electronic Devices.....	685