

2018 IEEE 18th International Conference on Power Electronics and Motion Control (PEMC 2018)

**Budapest, Hungary
26-30 August 2018**

Pages 1-548



**IEEE Catalog Number: CFP1834A-POD
ISBN: 978-1-5386-4199-6**

**Copyright © 2018 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:	CFP1834A-POD
ISBN (Print-On-Demand):	978-1-5386-4199-6
ISBN (Online):	978-1-5386-4198-9
ISSN:	2469-8741

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

POWER ELECTRONIC CONVERTER TOPOLOGIES

3-PHASE DIODE RECTIFIER WITH CURRENT MODULATION IN DC CIRCUIT	17
<i>Michał Gwóźdź ; Michał Krystkowiak ; Łukasz Ciepliński</i>	
A DIRECT MATRIX CONVERTER WITH SPACE VECTOR MODULATION FOR CONTACTLESS ENERGY TRANSFER SYSTEMS	22
<i>Jannis Noeren ; Nejila Parspour ; Benjamin Sekulic</i>	
A MULTIFUNCTIONAL INTEGRATED ONBOARD BATTERY CHARGER FOR PLUG-IN ELECTRIC VEHICLES (PEVS)	28
<i>K. A. Chinmaya ; G. K. Singh</i>	
A NOVEL HYBRID STEP-DOWN DC-DC CONVERTER	34
<i>Ioana-Monica Pop-Calimanu ; Septimiu Lica ; Dan Lascu ; Folker Renken ; Mircea Gurbina ; Radu Mirsu</i>	
A NOVEL POWER ELECTRONICS FOR CONTACTLESS INDUCTIVE ENERGY TRANSFER SYSTEMS	40
<i>David Maier ; Jannis Noeren ; Nejila Parspour ; Christopher Lauer</i>	
A NOVEL TYPE OF WIRELESS V2H WITH SINGLE SWITCH DUAL-ACTIVE SEAMLESS CONVERTER IN A SMART HOUSE	46
<i>Taichi Iwanaga ; Hideki Omori ; Tatsuya Takahashi ; Masahito Tsuno ; Toshimitsu Morizane ; Noriyuki Kimura</i>	
ACTIVE HYBRID FILTER APPLIED WITH A MULTI-CELL SWITCH-MODE POWER AMPLIFIER	52
<i>Helmut L. Votzi ; Hans Ertl ; Felix A. Himmelstoss</i>	
ANALYSIS AND VERIFICATION ON CLLC RESONANT BIDIRECTIONAL DC-DC CONVERTER BASED ON VARIABLE FREQUENCY PHASE DIFFERENCE CONTROL PRINCIPLE	58
<i>Koga Yasutaka ; Mishima Tomokazu</i>	
DESIGN CONSIDERATIONS OF GAN TRANSISTOR BASED CAPACITIVE WIRELESS POWER TRANSFER SYSTEM	66
<i>Kaspars Kroics ; Janis Voitkans ; Bohdan Pakhaliuk</i>	
DESIGN OPTIMIZATION OF HIGH-FREQUENCY WBG-BASED LLC RESONANT CONVERTER FOR TELECOM APPLICATIONS	72
<i>S. Karimi ; F. Tahami</i>	
OPTIMAL OPERATION REGION OF LLC RESONANT CONVERTER FOR ON-BOARD EV BATTERY CHARGER APPLICATIONS	78
<i>Sevilay Cetin ; Veli Yenil</i>	
DEVELOPMENT OF A SIMPLE FUZZY LOGIC CONTROLLER FOR DC-DC CONVERTER	86
<i>Martin Leso ; Jaroslava Zilkova ; Peter Girovsky</i>	
DIRECT CELL-TO-CELL VOLTAGE EQUALIZER USING CAPACITIVELY-ISOLATED PARALLEL-RESONANT CONVERTER FOR SERIES-CONNECTED ENERGY STORAGE CELLS	94
<i>Masatoshi Uno ; Koji Yoshino ; Koki Hasegawa</i>	
DPP CONVERTER USING LLC RESONANT VOLTAGE MULTIPLIER WITH A VOLTAGE DIVIDER FOR CURVED SOLAR ROOF OF PREVS	101
<i>Hayato Sato ; Tohru Nakane ; Toshiki Shinohara ; Masatoshi Uno</i>	
DYNAMIC MODELLING OF BRAKING ENERGY RECOVERED USING A BI-DIRECTIONAL POWER STATION ON DC RAILWAY ELECTRICAL NETWORK	109
<i>Kouassi N'guessan ; Navarro Nicolas ; Letrouvé Tony ; Caron Hervé ; Saudemont Christophe ; Francois Bruno ; Robyns Benoit</i>	
EXPANDABLE N-LEGGED CONVERTER FOR DYNAMIC WIRELESS POWER TRANSFER	115
<i>Farzad Farajizadeh ; Mahinda Vilathgamuwa ; Prasad Jayathurathnage ; Gerard Ledwich</i>	
FORMULATION AND DISTORTION COMPENSATION OF HALF-BRIDGE AC-AC CONVERTERS UNDER ASYMMETRICAL CONTROL	121
<i>Daiki Yaginuma ; Kyohei Yamada ; Hikaru Kitaoka ; Takashi Ohira</i>	
HIGH-FREQUENCY SOFT-SWITCHING DC-DC CONVERTER WITH NON-DISSIPATIVE TURN-OFF SNUBBER	127
<i>Marek Pastor ; Jaroslav Dudrik ; Milan Lacko</i>	
HIGHLY-EXTENDABLE CAPACITIVE CURRENT BALANCING MULTI-CHANNEL LED DRIVER WITH REDUCED CAPACITOR COUNT	133
<i>Yoshiya Tada ; Yusuke Sato ; Masatoshi Uno</i>	
LOSS ANALYSIS AND FIELD TESTING UNDER VARIOUS PARTIAL SHADING CONDITIONS FOR SWITCHED CAPACITOR-BASED CELL-LEVEL POWER BALANCING UTILIZING DIFFUSION CAPACITANCE OF PHOTOVOLTAIC CELLS	139
<i>Yota Saito ; Masaya Yamamoto ; Masatoshi Uno ; Shinichi Urabe</i>	
MODIFIED SEPIC DC-TO-DC CONVERTER 2/(1-K) OUTPUT GAIN CONFIGURATION FOR RENEWABLE POWER ENERGY AND HIGH VOLTAGE APPLICATIONS	145
<i>Emre Ozsoy ; Sanjeevikumar Padmanaban ; Viliam Fedak ; Charles Muranda ; Mihet Cernet</i>	

MODULAR EQUALIZATION SYSTEM USING PHASE-SHIFT SWITCHED CAPACITOR CONVERTER AND TAPPED-INDUCTOR-BASED RESONANT VOLTAGE MULTIPLIER FOR ENERGY STORAGE SYSTEMS.....	150
<i>Masatoshi Uno ; Koki Hasegawa ; Kazuki Yashiro</i>	
NONISOLATED SINGLE-MAGNETIC MULTI-PORT CONVERTER BASED ON INTEGRATION OF PWM CONVERTER AND DUAL ACTIVE BRIDGE CONVERTER.....	157
<i>Yusuke Sato ; Hikaru Nagata ; Masatoshi Uno</i>	
NONLINEAR MIMO CONTROL OF INTERLEAVED THREE-PORT BOOST CONVERTER BY MEANS OF STATE-FEEDBACK LINEARIZATION	164
<i>Ander Gonzalez ; Ramon Lopez-Erauskin ; Johan Gyselinck ; Tat KeiChau ; Herbert Ho-Ching Lu ; Tyrone Fernando</i>	
ON CURRENT THD EXTREME SWITCHING SEQUENCES FOR A SINGLE-PHASE CASCADE H-BRIDGE INVERTER WITH PHASE-SHIFTED PWM AND NON-EQUAL DC SOURCES	170
<i>Ruslan Polichshuk ; Nurzhan Zhuldassov ; Alex Ruderman ; Boris Reznikov</i>	
PERFORMANCE OF A TWO-STAGE ACTIVELY DAMPED LC FILTER FOR GAN/SIC MOTOR INVERTERS.....	177
<i>Franz Maislinger ; Hans Ertl ; Goran Stojcic ; Laura Siplika</i>	
PROGRAMMABLE POWER ELECTRONICS VOLTAGE SOURCE WITH SIGMA-DELTA MODULATOR IN CONTROL SECTION	184
<i>Michal Gwóźdz ; Dominik Matecki</i>	
SCC EQUIVALENT RESISTANCE: THE RELATIONSHIP FOR COMPLEMENTARY BUCK AND BOOST AND ACCURATE CALCULATION FOR 2-PHASE CONVERTERS	188
<i>Yerzhan Mustafa ; Ainur Zhaikhan ; Alex Ruderman</i>	
SOFT-SWITCHING CONVERTER BASED ON PRIMARY SERIES CONNECTION AND SINGLE TRANSFORMER.....	194
<i>Bor-Ren Lin ; Yong-Sheng Zhuang</i>	
THE DESIGN AND IMPLEMENTATION OF A SONAR POWER AMPLIFIER.....	199
<i>Osman Ulas Sahin</i>	
THE OPTIMAL COMPOSITION OF DIESEL PARTICULATE FILTER USING INDUCTION HEATING.....	205
<i>Sachio Kubota</i>	
TRANSIENT AND STEADY-STATE ANALYSIS OF A SEPIC CONVERTER BY AN AVERAGE STATE-SPACE MODELLING.....	211
<i>T. Polsky ; Y. Horen ; S. Bronshtein ; D. Baimel</i>	
TWO-PHASE INTERLEAVED SEPIC MPPT USING COUPLED INDUCTORS IN CONTINUOUS CONDUCTION MODE	216
<i>Murat Ünlü ; Onur Kircioğlu ; Sabri Çamur</i>	

POWER ELECTRONICS IN TRANSPORTATION (ROAD, AEROSPACE, MARINE AND RAILWAY VEHICLES, ELECTRIC AND HYBRID VEHICLES)

APPLICATION DEPENDENT OPTIMIZATION OF BALANCING METHODS FOR LITHIUM-ION BATTERIES	223
<i>Szabolcs Veréb ; Gergely G. Balázs ; Tamás Kokénycsi ; Zoltán Sütő ; István Varjasi</i>	
CHARGING PROCESS CONTROL OF DYNAMIC WIRELESS POWER TRANSFER SYSTEM WITH ACTIVE RECTIFIER AND WITHOUT WIRELESS COMMUNICATION SYSTEM	229
<i>Mojtaba Khalilian ; Paolo Guglielmi</i>	
CONTROLLER DESIGN OF A NEW UNIVERSAL TWO-PHASE SIC-GAN-BASED DC-DC CONVERTER FOR PLUG-IN ELECTRIC VEHICLES.....	236
<i>Milad Moradpour ; Gianluca Gatto</i>	
DC-DC BUCK CONVERTER PARAMETER IDENTIFICATION BASED ON A WHITE-BOX APPROACH.....	242
<i>Hariharan Balakrishnan ; Manuel Moreno-Eguilaz ; Jordi-Roger Riba ; Santiago Bogarra ; Antoni Garcia</i>	
DETERMINING RELATION BETWEEN SIZE OF POLARIZED INDUCTIVE COUPLERS AND NOMINAL AIRGAP	248
<i>Soumya Bandyopadhyay ; Jianning Dong ; Laura Ramirez-Elizondo ; Pavol Bauer</i>	
MAXIMUM TORQUE PER AMPERE BASED DIRECT TORQUE CONTROL SCHEME OF IM DRIVE FOR ELECTRICAL VEHICLE APPLICATIONS.....	256
<i>Pratibha Naganathan ; Srirama Srinivas</i>	
METHOD FOR TORSIONAL VIBRATIONS DETECTION OF LOCOMOTIVE WHEELSET BASED ON UNSCENTED KALMAN FILTER	262
<i>Petr Pichlik</i>	
MODELING AND ANALYSIS OF EMI AND OVERVOLTAGE PHENOMENON IN SIC INVERTER DRIVEN MOTOR AT HIGH SWITCHING FREQUENCY	268
<i>Duc-Hoan Tran ; Gilles Segond ; Victor Dossantos</i>	
MULTI-OBJECTIVE OPTIMIZATION DESIGN OF ELECTRIC VEHICLE CONVERTERS BASED ON ε-γ-σ.....	274
<i>Xu Luo ; Xuemei Wang ; Haiping Wu</i>	
MULTIPHASE DC/DC CONVERTER AND ITS USE IN THE POWERTRAIN OF FUEL CELL VEHICLES.....	280
<i>Folker Renken ; Wensong Shen ; Udo Schürmann ; Ioana-Monica Pop-Calimanu</i>	
NOVEL DESIGN APPROACH OF WIRELESS CHARGERS FOR ELECTRIC VEHICLES	287
<i>Lucian Mandache ; Andrei Marinescu ; Ionel Dumbrava</i>	

NUMERICAL AND EXPERIMENTAL STUDY ON THE COOLING PERFORMANCE AFFECTED BY VENTILATION HOLES OF A BLDC MOTOR FOR MULTI-COPTERS.....	293
<i>Sungjin Yang ; Yunju Jung ; Jungmoo Seo ; Myungsung Lee ; Joo-Han Kim</i>	
PARALLEL OPERATION DUAL-OUTPUT INVERTERS WITH PR CONTROL FOR RAILWAY SIGNAL POWER SYSTEMS	299
<i>Rui Zhao ; Jianxin Zhu ; Fan Wu ; Xun Gao ; Yan Xing ; Li Zhang ; Xudong Ma</i>	
DIFFERENT APPROACHES IN NUMERICAL SOLUTION OF CONTINUOUS MATHEMATICAL MODELS OF INDUCTION MACHINE	311
<i>Jan Bauer ; Ondrej Lincak ; Jan Kyncl</i>	

POWER ELECTRONICS IN ELECTRICAL ENERGY GENERATION, TRANSMISSION AND DISTRIBUTION

A SOFT-SWITCHING SINGLE-PHASE TWO-ARM DYNAMIC VOLTAGE RESTORER	319
<i>Maoh-Chin Jiang ; Tai-Chun Liu</i>	
ACTIVE CONTROL OF INDUCTION GENERATOR IN OCEAN WAVE ENERGY CONVERSION SYSTEM.....	324
<i>Nikola Vukajlovic ; Vladimir Katic ; Dragan Milicevic ; Boris Dumnic ; Bane Popadic</i>	
ADJUSTING THE LOW ORDER HARMONICS IN THE BATTERY CURRENTS FOR THE MICROGRID POWER CONVERTERS WITH THE INSTANT ISLANDING CAPABILITIES	330
<i>Jing Yang ; Pengcheng Li ; Zhongxiao Cong ; Yang Song ; Shuai Lu</i>	
ANALYSIS OF LOAD REGULATION FOR SERIES AND PARALLEL OUTPUT INVERTERS	338
<i>Zhilei Yao ; Jing Xu ; Simin Peng</i>	
COMPARATIVE ANALYSIS OF SMALL-SIGNAL DYNAMICS IN VIRTUAL SYNCHRONOUS MACHINES AND FREQUENCY-DERIVATIVE-BASED INERTIA EMULATION	344
<i>Jon AreSuul ; Salvatore D'Arco</i>	
COMPARISON OF A TWO-PHASE INTERLEAVED BOOST CONVERTER AND FLYBACK CONVERTER	352
<i>Aydin Boyar ; Ersan Kabalci</i>	
CONTROL STRATEGY FOR TWO-STAGE PHOTOVOLTAIC POWER CONVERTER DURING SIMULTANEOUS GRID FAULTS AND IRRADIANCE CHANGE	357
<i>Ivana Isakov ; Vladimir Katic ; Ivan Todorovic ; Stevan Grabic</i>	
DESIGN OF ALL-SINUSOIDAL SINGLE PHASE ON-LINE UPS WITH AVR FOR IMPROVING SINUSOIDAL OUTPUT VOLTAGE	363
<i>Ghazanfar Shahgholian ; Ahmad Omrani ; Jawad Faiz</i>	
DROOP CONTROL STRATEGY WITH A NOVEL CHARACTERISTIC MODEL	369
<i>Ki-Ryong Kim ; Jong-Pil Lee ; Tae-Jin Kim ; Ju-Won Baek</i>	
ENERGY MANAGEMENT STRATEGY FOR SUPERCAPACITOR STORAGE USING A NONLINEAR VIRTUAL IMPEDANCE	375
<i>Dan Hulea ; Octavian Cornea ; Nicolae Muntean</i>	
EXCITATION CONTROLLER FOR A SYNCHRONOUS GENERATOR WITH A DC EXCITER	381
<i>Dusan Joksimovic ; Slavko Veinovic ; Djordje Stojic</i>	
HYBRID MICROGRID SYSTEM DESIGN WITH RENEWABLE ENERGY SOURCES	387
<i>Ersan Kabalci ; Hilal Irgan ; Yasin Kabalci</i>	
INTRODUCTION TO THE ANALYSIS OF HARMONICS AND RESONANCES IN LARGE OFFSHORE WIND POWER PLANTS.....	393
<i>Lucia BeloquiLarumbe ; Zian Qin ; Pavol Bauer</i>	
NEW CONTROL STRATEGIES FOR IGBT BASED BRIDGE TYPE SFCL	401
<i>D. Baimel ; S. Tapuchi ; N. Baimel</i>	
NOVEL SEGMENTATION ALGORITHM FOR MAXIMUM POWER POINT TRACKING IN PV SYSTEMS UNDER PARTIAL SHADING CONDITIONS	406
<i>D. Baimel ; S. Tapuchi ; S. Bronshtein ; Y. Horen ; N. Baimel</i>	
OVER EXCITATION LIMITER FOR SYNCHRONOUS GENERATORS WITH LABVIEW	411
<i>Mustafa BahaBayram ; Ibrahim Sefa ; Selami Balci</i>	
POWER CONDITIONING UNIT FOR DIRECT-DRIVE WAVE ENERGY CONVERTER	416
<i>Yuriy Rozanov ; Konstantin Kryukov ; Mikhail Kiselev ; Mikhail Lapanov ; Yuriy Tserkovsky ; Ekaterina Namestnikova</i>	
PV SOURCE INVERTER WITH VOLTAGE COMPENSATION FOR WEAK GRID BASED ON UPQC CONFIGURATION	421
<i>Desmon PetrusSimatupang ; Jaeho Choi</i>	
SELF-EXCITATION SYSTEM USING HIGH-EFFICIENCY LOW-POWER PM GENERATOR	428
<i>Chong-Hyun Cho ; Jin-Woo Ahn ; Dong-Hee Lee</i>	
SIMILARITIES BETWEEN VIRTUAL OSCILLATOR CONTROLLED AND DROOP CONTROLLED THREE-PHASE INVERTERS.....	434
<i>Zhan Shi ; Hendra I. Nurdin ; John E. Fletcher ; Jiacheng Li</i>	
SYNCHRONOUS BUCK-BOOST CONVERTER FOR ENERGY HARVESTING APPLICATION	440
<i>Benjamin Ošlaj ; Primož Šlibar ; Mitja Truntič ; Miro Milanović</i>	
TECHNO-ECONOMIC FEASIBILITY STUDY ON AN OFF-GRID RENEWABLE ENERGY MICROGRID FOR AN ISOLATED GREENHOUSE IN ROMANIA	445
<i>T. Patarau ; D. Petreus ; R. Etz ; E. Lazar</i>	

THE DESIGN AND ANALYSIS OF A TWO-STAGE PV CONVERTER WITH QUASI-Z SOURCE INVERTER	451
<i>Ersan Kabalcı</i>	
TWO-STAGE POWER CONVERTER DESIGN AND CONTROL FOR RENEWABLE ENERGY SYSTEMS.....	457
<i>Efe İsa Tezde ; M. Muhsin Demir ; Fatih Gurel ; H. İbrahim Okumus ; Hakan Kahveci</i>	
VOLTAGE STABILITY IMPROVEMENT BY USING A NEWLY DESIGNED STATCOM CONTROLLER IN CASE OF HIGH WIND PENETRATION CASES	463
<i>Kadir Abacı ; Volkan Yamaçlı ; Zhe Chen</i>	

ELECTRICAL MACHINES AND ACTUATORS

A NEW TECHNIQUE TO IDENTIFY INDUCTION MACHINE ROTOR PARAMETERS DURING DYNAMIC OPERATION AND LOW SPEED	471
<i>W. Fahrner ; M. A. Vogelsberger ; T. Wolbank</i>	
A RAPID ESTIMATION OF THE ROTOR LOSSES IN HIGH SPEED SYNCHRONOUS PM MACHINES.....	477
<i>Emanuel Castagnaro ; Grazia Berardi ; Nicola Bianchi</i>	
ACCURATE ROTOR POSITION DETECTION FOR LOW-SPEED OPERATION OF SWITCHED RELUCTANCE DRIVES	483
<i>Iliya Ralev ; Sebastian Max ; Rik W. De Doncker</i>	
AN ANALYTICAL MODEL AND THE COMPARATIVE SIMULATION FOR STAND-ALONE OPERATED DFIG	491
<i>Mehmet Dal</i>	
AN ELECTROHYDRAULIC ACTUATION SCHEME USING NOVEL PIEZOELECTRICALLY-ACTUATED NOZZLE FLAPPER VALVE.....	499
<i>Yihao Du ; Bin Wang</i>	
ANALYSIS AND DESIGN OF SPOKE-TYPE FERRITE PERMANENT MAGNET MOTOR WITH ROTOR OVERHANG.....	512
<i>Jung-Moo Seo ; Ah-Reum Ro</i>	
ANALYSIS OF THE OPERATION OF A LINEAR GENERATOR FOR A FLOATING WAVE ENERGY CONVERTER.....	518
<i>Ekaterina Kurbatova ; Pavel Kurbatov ; Oleg Molokanov</i>	
COMPARISON OF INVERTER TOPOLOGIES SUITED FOR INTEGRATED MODULAR MOTOR DRIVE APPLICATIONS.....	524
<i>Mesut Uğur ; Hakan Saraç ; Ozan Keysan</i>	
DESIGN OF DUAL ROTOR AXIAL FLUX PERMANENT MAGNET GENERATORS WITH FERRITE AND RARE-EARTH MAGNETS.....	531
<i>Tohid Asefi ; Jawad Faiz ; M. A. Khan</i>	
DEVELOPMENT AND SIMULATION OF THE SERIES ELASTIC ACTUATOR FOR FORCE SENSING.....	539
<i>Ha-Neul Yun ; Jin-Uk Bang ; Ji-Hyun Kim ; Jang-Myung Lee</i>	
ENERGY-EFFICIENT FIELD-ORIENTED CONTROL FOR INDUCTION MOTORS TAKING INTO ACCOUNT CORE LOSSES	543
<i>Gabriel Khoury ; Ragi Ghosn ; Flavia Khatounian ; Maurice Fadel ; Mathias Tientcheu</i>	
FEEDFORWARD FINITE CONTROL SET MODEL PREDICTIVE POSITION CONTROL OF PMSM	549
<i>Karol Kyslan ; Viktor Šlapák ; František Durovský ; Viliam Fedák ; Sanjeevikumar Padmanaban</i>	
HIGH-SPEED SYNCHRONOUS RELUCTANCE MOTORS: COMPUTATION OF THE POWER LIMITS BY MEANS OF RELUCTANCE NETWORKS	556
<i>Cristian Babetto ; Nicola Bianchi ; Carlos López ; Antoni Garcia ; Luis Romeral</i>	
INFLUENCE OF POLES EMBRACE ON IN-WHEEL SWITCHED RELUCTANCE MOTOR DESIGN	562
<i>Merve Yildirim ; Hasan Kurum</i>	
LOW VOLTAGE RELUCTANCE SYNCHRONOUS MOTOR WITH NEW RELUCTANCE ROTOR FOR WATER PUMP	568
<i>Pavol Rafajdus ; Valeria Hrabovcova ; Pavel Lehockv ; Pavol Makys ; Michal Kremen</i>	
MODELING AND ANALYSIS OF A NEW VOLTAGE REGULATION METHOD FOR SURFACE-MOUNTED PERMANENT MAGNET SYNCHRONOUS GENERATOR.....	574
<i>Yongjie Wang ; Huizhen Wang ; Weifeng Liu ; Qin Wang</i>	
NATURE INSPIRED OPTIMAL DESIGN OF AXIAL FLUX PERMANENT MAGNET MOTOR FOR ELECTRIC VEHICLE.....	580
<i>Goga Cvetkovski ; Lidija Petkovska</i>	
POWER HIL EMULATION OF AC MACHINES WITH PARALLEL CONNECTED ANPC BRIDGE ARMS	592
<i>Zoltán Sütő ; Attila Balogh ; Dávid Kiss ; Szabolcs Veréb ; István Varjasi</i>	
REGENERATIVE TESTING OF MULTIPHASE MACHINES WITH MULTIPLE THREE-PHASE WINDINGS	599
<i>Mikel Zabaleta ; Emil Levi ; Martin Jones</i>	
SENSORLESS CONTROL OF WIND TURBINE CONVERSION EQUIPPED WITH A DFIG USING MPPT STRATEGY	605
<i>H. Becheri ; I. K. Bousserhane ; A. Harrouz ; Ilhami Colak ; Korhan Kayisli</i>	
SIMULATION OF THE BODY MOTION IN A TUBE WITH THE LINEAR HTS SUSPENSION	611
<i>Pavel Kurbatov ; Ekaterina Kurbatova ; Pavel Dergachev ; Yurii Kulayev</i>	
SYNTHETIC LOADING FOR SYMMETRICAL AND ASYMMETRICAL SIX-PHASE MACHINES	617
<i>A. A. Abdulllah ; O. Dordevic ; M. Jones</i>	

TORQUE RIPPLE MINIMIZATION IN DOUBLE U CORE SWITCHED RELUCTANCE MOTOR	623
<i>Mustafa Aydemir ; Halil Ibrahim Okumus ; Merve Aydin</i>	
V/F WITH STABILIZING LOOPS VERSUS FOC OF SPOKE-PM ROTOR SM DRIVE: CONTROL WITH EXPERIMENTS.....	629
<i>Andy-Sorin Isfanuti ; Mihaela-Codruta Paicu ; Lucian-Nicolae Tutelea ; Tiago Staudt ; Ion Boldea</i>	

MOTION CONTROL, ADJUSTABLE SPEED DRIVES AND ROBOTICS, MECHATRONICS

A NUMERICAL DETERMINATION OF POWER DISTRIBUTION IN THE RESISTANCE WELDING MACHINE OUTPUT CIRCUIT	639
<i>Mariusz Stepien ; Boguslaw Grzesik ; Zygmunt Mikno</i>	
ACTIVE DISTURBANCE REJECTION CONTROL BASED LOAD SIDE SPEED CONTROLLER FOR TWO MASS SYSTEM WITH BACKLASH	645
<i>Bartłomiej Wicher ; Stefan Brock</i>	
APPLICATION OF CUCKOO SEARCH ALGORITHM FOR SPEED CONTROL OPTIMIZATION IN TWO-SIDED ELECTRICAL DRIVE	651
<i>Krzysztof Zawirski ; Krzysztof Nowopolski ; Przemysław Siwek</i>	
COMPARATIVE STUDY OF CONTROL STRUCTURES FOR MAGLEV SYSTEMS	657
<i>Elena-Lorena Hedrea ; Claudia-Adina Bojan-Dragos ; Radu-Emil Precup ; Emil M. Petriu</i>	
DESIGN AND SIMULATION OF BISTABLE PIEZOCERAMIC CANTILEVER FOR ENERGY HARVESTING FROM SLOW SWINGING MOVEMENT.....	663
<i>Ondrej Rubes ; Zdenek Hadas</i>	
DIFFERENT APPROACHES IN NUMERICAL SOLUTION OF CONTINUOUS MATHEMATICAL MODELS OF INDUCTION MACHINE	669
<i>Jan Bauer ; Ondrej Lipcak ; Jan Kyncl</i>	
DISCRETE SLIDING MODE CONTROL OF INDUCTION MOTOR TORQUE AND STATOR CURRENT COMPONENTS	675
<i>Grzegorz Tarchala</i>	
HOW TO CHOOSE ELECTRIC MOTOR FOR ADJUSTABLE SPEED DRIVE (ASD).....	681
<i>Slobodan Mircevski ; Dragan Vidanovski ; Sergey Ryvkin</i>	
IDENTIFICATION OF THE STATOR FAULTS IN THE INDUCTION MOTOR DRIVES USING PARAMETER ESTIMATOR.....	688
<i>Szymon Antoni Bednarz ; Mateusz Dybkowski ; Marcin Wolkiewicz</i>	
INITIAL ROTOR POSITION ESTIMATION FOR WOUND-EXCITED DOUBLY SALIENT MACHINE BASED ON LINE-TO-LINE FLUX LINKAGE METHOD	694
<i>Weifeng Liu ; Huizhen Wang ; Yongjie Wang ; Lan Xiao ; Ningrong Zhang</i>	
INTEGRATION OF REAL-TIME ELECTRIC POWER STEERING SYSTEM MATLAB/SIMULINK MODEL INTO NATIONAL INSTRUMENTS VERISTAND ENVIRONMENT.....	700
<i>Raul-Octavian Nemes ; Mircea Ruba ; Claudia Martis</i>	
LIMITED-JERK SINUSOIDAL TRAJECTORY DESIGN FOR FOC OF PMSM WITH H-INFINITY OPTIMAL CONTROLLER	704
<i>Mehmet Kaan Mutlu ; Ozan Keysan ; Baris Ulutas</i>	
LONGITUDINAL FLIGHT MULTI-CONTROL BLENDING VERIFICATION USING COTS BASED SIMULATION	711
<i>Khaled Fellah ; Mohamed Guiatni ; Tim Fricke ; Florian Holzapfel</i>	
MOTION CONTROL OF A DUAL-MOTOR INTERIOR PERMANENT MAGNET BEARINGLESS MACHINE	717
<i>Pekko Jaatinen ; Jouni Vuojolainen ; Teemu Sillanpää ; Niko Nevaranta ; Rafal Jastrzebski ; Olli Pyrhönen</i>	
MOTION SYNCHRONIZATION OF BIAxIAL LINEAR TOOTH BELT DRIVE SYSTEM.....	723
<i>Jukka Parkkinen ; Niko Nevaranta ; Markku Niemelä ; Tuomo Lindh ; Juha Pyrhönen</i>	
OVERLOAD-CAPABILITY ANALYSIS OF PMSM SERVO- AND ROBOT-DRIVES USING DTC-SVM METHODS: PART 1	730
<i>Tibor Vajsz ; László Számel</i>	
OVERLOAD-CAPABILITY ANALYSIS OF PMSM SERVO- AND ROBOT-DRIVES USING DTC-SVM METHODS: PART 2	737
<i>Tibor Vajsz ; László Számel</i>	
PARAMETER SENSITIVITY ANALYSIS METHOD FOR SPEED SENSORLESS INDUCTION MACHINE DRIVES BASED ON UNSCENTED KALMAN FILTER	744
<i>Krisztián Horváth ; Márton Kuslits</i>	
PREDICTIVE CONTROL OF THE TWO-MASS DRIVE WITH AN INDUCTION MOTOR FOR A WIDE SPEED RANGE.....	750
<i>P. Serkies ; K. Szabat</i>	
SINUSOIDAL INPUT CURRENT AND AVERAGE SPEED CONTROL OF A SINGLE-PHASE SUPPLIED THREE-PHASE INVERTER DRIVE WITHOUT ELECTROLYTIC CAPACITOR.....	756
<i>M. Haider ; D. Bortis ; J. W. Kolar ; Y. Ono</i>	
STABLE AND ROBUST CONTROLLER FOR INDUCTION MOTOR DRIVE	764
<i>Pavol Fedor ; Daniela Perdukova ; Karol Kyslan ; Viliam Fedak</i>	

STRUCTURAL PARAMETER OPTIMIZATION TO REDUCE COGGING TORQUE OF THE CONSEQUENT POLE IN-WHEEL MOTOR	770
<i>Guming Ma ; Xin Qiu ; Jianfei Yang ; Feifei Bu ; Yiping Dou ; Wei Cao</i>	
SUSPENSION CHARACTERISTICS OF MAGNETICALLY SUSPENDED FRAME IN INERTIALLY STABILIZED PLATFORM	776
<i>Biao Xiang ; Waion Wong</i>	
TOTAL COST OF OWNERSHIP OPTIMIZATION OF MANUFACTURING MACHINES WITH FAST ENERGY STORAGE	784
<i>Bert Lcnaerts ; Ahmed Abdallh ; Davy Maes ; Branimir Mrak ; Timothy Galle ; Wim De Waele</i>	

SENSORS, MEASUREMENT AND OBSERVATION TECHNIQUE

A COMBINED APPROACH TO IDENTIFY INDUCTION MACHINE PARAMETERS AND TO DESIGN AN EXTENDED KALMAN FILTER FOR SPEED AND TORQUE ESTIMATION	793
<i>Oliver Wallscheid ; Maximilian Schenke ; Joachim Böcker</i>	
A NOVEL POSITION ERROR COMPENSATION METHOD FOR HIGH-SPEED PERMANENT MAGNET SYNCHRONOUS MOTOR SENSORLESS DRIVE SYSTEM	800
<i>Cong Gu ; Xiaolin Wang ; Xiaoqing Shi ; Zhiqian Deng</i>	
APPLICATION OF DIFFERENT NUMERICAL INTEGRATION METHODS FOR DISCRETE MRAS^{CC} ESTIMATOR OF INDUCTION MOTOR SPEED - COMPARATIVE STUDY	806
<i>Mateusz Korzonek ; Teresa Orłowska-Kowalska</i>	
DISCRETE LINEAR FUNCTIONAL OBSERVER FOR THE THERMAL ESTIMATION IN POWER MODULES	812
<i>Sakhraoui Imane ; Trajin Baptiste ; Rotella Frédéric</i>	
EFFICIENCY AND NEAR-FIELD EMISSION COMPARISONS OF A SI- AND GAN BASED BUCK CONVERTER TOPOLOGY	818
<i>M. Lenzhofer ; A. Frank</i>	
FPGA-DRIVEN DAC WITH SECOND ORDER SLIDING MODE CONTROL OF FILTER MODEL FOR HARDWARE-IN-THE-LOOP SIMULATORS	824
<i>Tamas Kokenyesi ; Marton Hegedus ; Szabolcs Vereb ; Attila Balogh ; Zoltan Suto ; Istvan Varjasi</i>	
INVESTIGATION OF THE SOLAR ANGLES CHANGE FOR MOTION CONTROL OF TWO-AXIS SOLAR TRACKING SYSTEMS	830
<i>Merve Aydin ; H-Ibrahim Okumus ; E.-I. Tezde ; Mustafa Aydemir</i>	
MEASUREMENT AND MONITORING OF TWO-PHASE FLOW WITH ULTRASONIC SENSORS	834
<i>Javad Abbaszadeh ; Sahar Sarafi</i>	
NOVEL ELECTROMAGNETIC METHOD FOR UNDERGROUND TUNNELS DETECTION	840
<i>S. Tapuchi ; D. Baimel</i>	
ON-LINE RESISTANCE MEASUREMENT OF SUBSTATION CONNECTORS FOCUSED ON PREDICTIVE MAINTENANCE	846
<i>Akash Kadechkar ; Jordi-Roger Riba ; Manuel Moreno-Eguilaz ; Francesca Capelli ; David González</i>	
OPTIMAL CURRENT SENSOR POSITION FOR SWITCHED RELUCTANCE MOTOR DRIVES IN VIEW OF FAULT DETECTION	852
<i>Wei Peng ; Johan Gyselinck ; Jin-Woo Ahn ; Dong-Hee Lee</i>	
PICKUP MAGNETIC SENSORS: A DEDICATED SIMULATION TOOL TO EVALUATE INNOVATIVE HYBRID MATERIALS	858
<i>Luca Ferraris ; Emir Poskovic ; Fausto Franchini</i>	
QUADCOPTER BASED AUTOMATION OF PHOTOMETRIC MEASUREMENTS	864
<i>Bertalan Pizág ; Balázs Vince Nagy</i>	
SPECTRUM AND CEPSTRUM BASED SPEED DETERMINATION OF STEPPER MOTORS	870
<i>Gábor Gárdonyi ; Samu Krisztján</i>	

ACTIVE FILTERING AND UNITY POWER FACTOR CORRECTION

A BASIC POWER ELECTRONIC LABORATORY EXPERIMENT ALLOWING COMPREHENSIVE AND STRUCTURED LEARNING: MULTI-PHASE CAPACITIVE LOADED FULL-BRIDGE RECTIFIER	881
<i>Oğuzhan Öztoprak ; Ahmet M. Hava</i>	
ALUMINIUM ELECTROLYTIC CAPACITOR MODEL FOR CAPACITOR MATERIALS STRUCTURE TRANSFORMATION ANALYSIS IN PWM APPLICATIONS	888
<i>Laszlo Kovacs ; Gabor Kohlrusz ; Krisztian Enisz ; Denes Fodor</i>	
CONTINUOUS SM CONTROLLER WITH ARTIFICIAL INCREASE OF RELATIVE DEGREE FOR GRID-CONNECTED SHUNT ACTIVE/LCL FILTER	894
<i>Alali Mohamad Alaa Eddin ; Yuri. B Shtessel ; Barbot Jean-Pierre</i>	
DEALING WITH DISTORTIONS AFFECTING THE EQUIPMENT FOR HYDROGEN GENERATION IN A POWER PLANT	900
<i>Ileana-Diana Nicolae ; Petre-Marian Nicolae ; George-Cristian Enache ; Lucian-Cristian Scărlătescu</i>	

DETAILED OFF-LINE PARAMETER IDENTIFICATION OF SYNCHRONOUS GENERATOR BASED ON FREQUENCY RESPONSE TESTS	906
<i>Santiago Bogarra ; Antoni Garcia ; Manuel Moreno-Eguilaz ; Jordi-Roger Riba</i>	
EXPERIMENTAL SETUP FOR THE EVALUATION OF THE DUTY CYCLE INFLUENCE OVER THE DISTORTING REGIME	912
<i>Radu-Florin Marinescu ; Petre-Marian Nicolae ; Ileana-Diana Nicolae ; Cristina-Diana Marinescu ; Marcela Popescu</i>	
IMPACT OF THE DIFFERENT PARASITIC INDUCTANCES ON THE SWITCHING BEHAVIOR OF SIC MOSFETS	918
<i>Georges Engelmann ; Niklas Fritz ; Christoph Lüdecke ; Rik W. De Doncker ; Zhuxian Xu ; Xi Lu ; Chingchi Chen ; Jun Kikuchi</i>	
MATLAB-BASED TOOL FOR TEACHING OF ACTIVE MAGNETIC BEARING DESIGN TO UNDERGRADUATE STUDENTS.....	926
<i>Jouni Vuojolainen ; Niko Nevaranta ; Rafal Jastrzebski ; Olli Pyrhonen</i>	
PHASE-MATCHED FREQUENCY ADAPTIVE REPETITIVE CONTROLLER FOR A GRID-SUPPORTING STATCOM.....	932
<i>Javier Roldán-Pérez ; Aurelio García-Cerrada ; Alberto Rodríguez-Cabero ; Milan Prodanovic</i>	
SHUNT ACTIVE POWER FILTER FOR HARMONICS MITIGATION WITH HARMONIC ENERGY RECYCLING FUNCTION	938
<i>R. Guzman Iturra ; M. Cruse ; K. Mütze ; P. Thiemann ; C. Dresel</i>	
VIRTUAL LEARNING ENVIRONMENT FOR CONTROL ENGINEERING EDUCATION.....	946
<i>Niko Nevaranta ; Krister Gräsbeck ; Jari-Pekka Haapala ; Tuomo Lindh ; Pasi Peltoniemi ; Hanna Niemelä ; Olli Pyrhönen</i>	

MODELING AND CONTROL OF MULTILEVEL CONVERTERS

A NOVEL CONTROLLER FOR GRID-INTERFACING SOLAR ARRAYS THROUGH FIVE-LEVEL DIODE-CLAMPED CONVERTERS	955
<i>Pablo Montero Robina ; Francisco Gordillo</i>	
A SINGLE-PHASE SYMMETRICAL EMBEDDED MODIFIED-QUASI-Z-SOURCE HYBRID THREE-LEVEL INVERTER.....	962
<i>Anh-Vu Ho ; Tae-Won Chun</i>	
AN IMPROVED VOLTAGE RIPPLE CONTROL ALGORITHM FOR MODULAR MULTILEVEL CONVERTER BASED VARIABLE SPEED DRIVE.....	968
<i>Safia Babikir Bashir ; Hasan A. Zidan ; Stanimir Valtchev</i>	
AN ISOLATED BUCK-BOOST CONVERTER WITH HYBRID THREE-LEVEL RECTIFIER FOR WIDE AND HIGH OUTPUT VOLTAGE APPLICATIONS.....	974
<i>Mengxi Li ; Yangjun Lu ; Yu Yu ; Hongfei Wu ; Yan Xing ; Xudong Ma</i>	
HYBRID CCS/FCS MODEL PREDICTIVE CURRENT CONTROL OF A GRID CONNECTED TWO-LEVEL CONVERTER.....	981
<i>Šandor Ileš ; Tin Bariša ; Damir Sumina ; Jadranko Matuško</i>	
LEVEL SELECTION ALGORITHM WITH FIXED SAMPLING FREQUENCY FOR MODULAR MULTILEVEL CONVERTER	987
<i>Chan-Ki Kim ; Chanz-Hwan Park ; Janz-Mok Kim</i>	
MODELING OF THE MODULAR MULTILEVEL CONVERTERS BASED ON THE STATE-PLANE ANALYSIS AND ΣΔ COORDINATE TRANSFORMATION.....	993
<i>Yi-Hsun Hsieh ; Fred C. Lee</i>	
MODULAR MULTILEVEL CONVERTER PERFORMANCE WITH DYNAMIC MVDC DISTRIBUTION LINK VOLTAGE RATING.....	1000
<i>Aditya Shekhar ; Laura Ramírez-Elizondo ; Zian Qin ; Pavol Bauer</i>	
NEW FIVE LEVEL RESONANT DC/DC BUCK CONVERTER.....	1006
<i>Lilla Litvani ; Janos Hamar</i>	
OPTIMAL PWM FOR TWO-LEVEL INVERTER FED HIGH SPEED INDUCTION MACHINES	1012
<i>Péter Stumpf ; Sándor Halász</i>	
SELECTIVE HARMONIC ELIMINATION WITH PARTICLE SWARM OPTIMIZATION IN MULTILEVEL INVERTERS	1019
<i>Elif Selin Durak ; Halil Ibrahim Okumus ; Mehmet Ali Usta ; Hakan Kahveci</i>	
SENSORLESS FEEDBACK LINEARIZATION DIRECT TORQUE CONTROL (FBL-DTC) FOR INDUCTION MOTOR DRIVE WITH FIVE-LEVEL CASCADED H-BRIDGE INVERTER	1025
<i>Mehmet Ali Usta ; Halil Ibrahim Okumus ; Hakan Kahveci ; Elif Selin Durak</i>	
SIMPLE FAULT-TOLERANT CONTROL USING UNIFIED VOLTAGE MODULATION FOR ACTIVE NEUTRAL POINT CLAMPED (ANPC) THREE-LEVEL INVERTER.....	1031
<i>Byoung-Gun Park ; Jae-Woon Lee ; Min-Hyuk An ; Soon-Man Kwon ; Ji-Won Kim</i>	
TIME DOMAIN CONSTRAINED OPTIMIZATION OF LOW SWITCHING FREQUENCY SYNCHRONOUS MODULATION FOR A TWO-LEVEL THREE-PHASE INVERTER	1038
<i>Anvar Khamitov ; Aldiyar Samedyarov ; Ruslan Polichshuk ; Alex Ruderman</i>	
UNIPOLAR SINGLE REFERENCE MULTICARRIER SINUSOIDAL PULSE WIDTH MODULATION BASED 7-LEVEL INVERTER WITH REDUCED NUMBER OF SEMICONDUCTOR SWITCHES FOR RENEWABLE ENERGY APPLICATIONS.....	1043
<i>Raj Kiran ; Mahajan Sagar Bhaskar ; Sanjeevikumar Padmanaban ; Frede Blaabjerg ; Patrick Wheeler ; Muhammad H. Rashid</i>	

POWER ELECTRONICS APPLICATIONS IN MICROGRID AND DISTRIBUTED GENERATION

A PROGRAMMABLE BATTERY TESTER WITH ENERGY RECYCLING TECHNIQUE FOR LITHIUM-ION BATTERY	1051
<i>Chang-Hua Lin ; Chien-Ming Wang ; Guan-Jung Chen</i>	
DC MICROGRID TOPOLOGIES AND STABILITY ANALYSIS FOR ELECTRIFIED TRANSPORTATION SYSTEMS.....	1055
<i>Shengzhao Pang ; Babak Nahid-Mobarakeh ; Serge Pierfederici ; Yigeng Huangfu ; Guangzhao Luo ; Fei Gao</i>	
DC-DC BOOST CONVERTER STABILITY WITH CONSTANT POWER LOAD	1061
<i>Mohammed Kh. Al-Nussairi ; Ramazan Bayindir</i>	
DESIGN AND ANALYSIS OF A TWO-PHASE INTERLEAVED BOOST CONVERTER BASED MICROINVERTER.....	1067
<i>Aydin Boyar ; Ersan Kabalci</i>	
DESIGN OF A POWER FLOW CONTROL CONVERTER FOR BIPOLAR MESHED LVDC DISTRIBUTION GRIDS.....	1073
<i>Pavel Purgat ; Laurens Mackay ; Matthias Schulz ; Yunchao Han ; Zian Qin ; Martin März ; Pavol Bauer</i>	
IDENTIFICATION OF THE COMMON MODE IMPEDANCE OF A MICROGRID DC-DC BUCK CONVERTER IN NORMAL SERVICE AND UNDER INSULATION FAULT	1079
<i>Djelloul Bensaad ; A. Hadjadj ; Achour Ales ; Stanimir Valtchev</i>	
OUTPUT POWER REGULATION OF A VIRTUAL OSCILLATOR CONTROLLED INVERTER	1085
<i>Muhammad Ali ; Hendra I. Nurdin ; John E. Fletcher</i>	
Author Index	