

# **2019 22nd International Conference on Electrical Machines and Systems (ICEMS 2019)**

**Harbin, China  
11-14 August 2019**

**Pages 1-731**



**IEEE Catalog Number: CFP19801-POD  
ISBN: 978-1-7281-3399-7**

**Copyright © 2019 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:	CFP19801-POD
ISBN (Print-On-Demand):	978-1-7281-3399-7
ISBN (Online):	978-1-7281-3398-0
ISSN:	2640-7841

**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)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# Program

## 2019 22nd International Conference on Electrical Machines and Systems (ICEMS)

### Motion Control and Servo Systems (2-1)

<i>Model Predictive Control with Improved Current Loop Cascaded for Manipulator Systems</i> Zihang Yuan (Harbin Institute of Technology, P.R. China), Chengde Tong (Harbin Institute of Technology, P.R. China), Faliang Liu (Harbin Institute of Technology, P.R. China), Shijie Yang (Harbin Institute of Technology, P.R. China), Dongliang Wu (Harbin Institute of Technology, P.R. China), Ping Zheng (Harbin Institute of Technology, P.R. China) .....	1
<i>Multi-motor fault-tolerant synchronous control system based on fuzzy feedback</i> Lishi Zhang (Xi'an Jiaotong University, P.R. China), Deliang Liang (Xi'an Jiaotong University, P.R. China), Shengliang Cai (Xi'an Jiaotong University, P.R. China), Yating Luo (Xi'an Jiaotong University, P.R. China), Kun Zhou (Xi'an Jiaotong University, P.R. China) .....	7
<i>A New Era of Servo System Structure_The SoC-Based Multi-Axis Control-Drive Integration Platform</i> Yang-yang Chen (Harbin Institute of Technology, P.R. China), Ming Yang (Harbin Institute of Technology, P.R. China), Jiang Long (Harbin Institute of Technology, P.R. China), Yong-ping Sun (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China), Frede Blaabjerg (Aalborg University, Denmark) .....	11
<i>Analysis of Sampling Frequency on Mechanical Parameter Identification in A Two-Mass Servo Drive System</i> Can Wang (Shenzhen University, P.R. China), Jianfei Pan (Shenzhen University, P.R. China), Yue Hong (Shenzhen University, P.R. China), Yun Liu (Shenzhen University, P.R. China) .....	17
<i>Cross-coupled Contour Tracking Control of Direct Drive H-type Platform Based on Real-time Contour Error Estimation</i> Zhang Kang (Shenyang, P.R. China), Wang Limei (Shenyang, P.R. China) .....	22

### Sensorless Control (2-1)

<i>An Integral Sliding Mode Back-EMF Observer for Position-Sensorless Permanent Magnet Synchronous Motor Drives</i> Yanzhen Shao (Harbin Institute of Technology, P.R. China), Bo Wang (Harbin Institute of Technology, P.R. China), Yong Yu (Harbin Institute of Technology (HIT), P.R. China), Minghe Tian (Harbin Institute of Technology, P.R. China), Qinghua Dong (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China) .....	27
<i>A Novel High Frequency Signal Injection Based Sensorless Control Method for Six-Phase FTPMSM System</i> Hao Fang (Beihang University, P.R. China), Jinqian Xu (Beihang University, unknown), Yutao Du (Beijing University of Aeronautics and Astronautics, unknown) .....	32
<i>Sensor-less Vector Control for Automotive Auxiliary Motors in the Full Speed Range</i> Li Lingzhi (Huaqiao University, P.R. China), Guo Xinhua (Huaqiao University, P.R. China) .....	38
<i>Effect of Parameter Tuning on Driving Performance of a Universal-Sensorless-Vector-Controlled Closed-Slot Cage Induction Motor</i> Shu Yamamoto (Polytechnic University, Japan), Hideaki Hirahara (Polytechnic University, Japan) .....	42
<i>Force Sensorless Control for Aircraft Electro-mechanical Brake</i> Di Song (School of Automation, Northwestern Polytechnical University, P.R. China), Bingqiang Li (Northwestern Polytechnical University, unknown), Hualing Xing (School of Automation, Northwestern Polytechnical University, P.R. China), Yiyun Zhao (Northwestern Polytechnical University, P.R. China), Xi Zhang (Northwestern Polytechnical University, P.R. China) .....	48
<i>Sensorless Starting Control of Brushless Synchronous Starter/Generators by Using the Main Exciter as a Position Sensor</i> Shuai Mao (Northwestern Polytechnical University, P.R. China), Weiguo Liu (Northwestern Polytechnic University, P.R. China), Jichang Peng (Northwestern Polytechnical University, P.R. China), Fangning Gao (Northwestern Polytechnical University, P.R. China), Ningfei Jiao (Northwestern Polytechnical University, P.R. China) .....	53

## Renewable Energy Systems (4-1)

<i>Large Signal Stability Analysis of Microgrid System Based on Power Converter system</i>	
Xinbo Liu (North China University of Technology, P.R. China), Zhuo Gao (North China University of Technology, P.R. China), Yuan Tian (North China University of Technology, P.R. China) .....	58
<i>A Power Sharing Control Method of Parallel Hybrid Inverters to Preserve Microgrid Stability</i>	
Fenggang Zhang (Tongji University & Sungrow Power Supply (Shanghai) Co., Ltd., P.R. China), Jinsong Kang (Tongji University, P.R. China) .....	63
<i>Virtual Synchronous Generator Control for Direct-Drive Wave Power Generation System</i>	
Hongwei Fang (Tianjin University, P.R. China), Zhiwei Yu (Tianjin University, P.R. China), Wei Gao (Jishui Power Supply Company State Grid Jiangxi Electric Power Company, P.R. China) .....	67
<i>A Simplified Implementation of Nonorthogonal Space Vector Modulation for Three Level Converter With Optimal Switching Sequences</i>	
Yanyuan Zhuang (Harbin Institute of Technology, P.R. China), Weiwei Li (Harbin Institute of Technology, P.R. China), Xueguang Zhang (Harbin Institute of Technology (HIT), P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China) .....	73
<i>Control and Modulation Method of a Three-phase Eight-switch Inverter for Two-stage Grid-connected Photovoltaic Systems</i>	
Hao Zhou (Dongguan University of Technology, P.R. China), Zhi Zhang (Dongguan University of Technology, P.R. China), Zhihui Guo (Dongguan University of Technology, P.R. China), Zhaoyun Zhang (Dongguan University of Technology, P.R. China), Zhiping Wang (Dongguan University of Technology, P.R. China), Chengliang Deng (Dongguan University of Technology, P.R. China) .....	78
<i>Large-Signal Stability Analysis and Shunt Active Damper Compensation for DC microgrid with Multiple Constant Power Loads</i>	
Jia Ming (School of Electrical Engineering, Shandong University, P.R. China), Yubin Wang (School of Electrical Engineering, Shandong University, P.R. China), Fan Wang (School of Electrical Engineering, Shandong University, P.R. China), Bing Su (School of Electrical Engineering, Shandong University, P.R. China) .....	84

## Permanent-Magnet Motors and Drives (14-1)

<i>Fault Diagnosis of Motor Bearing Based on Speed Signal Kurtosis Spectrum Analysis</i>	
Ren Boyang (Harbin Institute of Technology, P.R. China), Ming Yang (Harbin Institute of Technology, P.R. China), Na Chai (Harbin Institute of Technology, P.R. China), Yunsong Li (University of Institute, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China) .....	90
<i>A Novel Stator-PM Vernier Fault-Tolerant Machine with Consequent Pole Structure</i>	
Weiguo Tao (Jiangsu University, P.R. China), Huawei Zhou (Jiangsu University, P.R. China), Guohai Liu (Jiangsu University, P.R. China) .....	96
<i>Torque Estimation and Control of PMSM Based on Deep Learning</i>	
Yubai Yan (Chinese Academy of Sciences Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, P.R. China), Jianing Liang (Shenzhen Institutes of Advanced Technology, P.R. China), Tianfu Sun (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, P.R. China), Jianping Geng (Guilin University of Electronic Technology, P.R. China), Gang Xie (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, P.R. China), Jiadong Pan (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, P.R. China) .....	100
<i>Extended State Observer Based Current Decoupling Control for PMSM</i>	
Yuzhu Wang (Hefei University of Technology, P.R. China), Shuying Yang (Hefei University of Technology, P.R. China), Zhen Xie (Hefei University of Technology, P.R. China) .....	106
<i>Online Multi-parameter Identification of Long-mover Permanent Magnet Linear Motor</i>	
Leyang Yan (Harbin Institute of Technology, P.R. China), Donglai Zhang (Shenzhen Graduate School of Harbin Institute of Technology, P.R. China), Chunlei Zhang (Tsinghua University, P.R. China) .....	112
<i>Torque Ripple Suppression Based Fast Harmonics Decomposition</i>	
Jie Li (Harbin Institute of Technology, P.R. China), Xiao Li (Harbin Institute of Technology, P.R. China), Yijia Zhang (Harbin Institute of Technology, P.R. China), Xianguo Gui (Harbin Institute of Technology, P.R. China) .....	117
<i>Compensating Neutral Current, Voltage Unbalance and Improving Voltage of an Unbalanced Distribution Grid Connected with EV and Renewable Energy Sources</i>	
Md Rabiul Islam (University of Technology Sydney, Australia), Haiyan Lu (University of Technology Sydney, Australia), Md Jahangir Hossain (Macquarie University, Australia), Li Li (University of Technology Sydney, Australia) .....	123

## Permanent-Magnet Motors and Drives (14-2)

<i>Magnet Temperature Estimation of PMTLM Based on Stator Resistance Identification and Thermal Model Combination</i> Leyang Yan (Harbin Institute of Technology, P.R. China), Donglai Zhang (Shenzhen Graduate School of Harbin Institute of Technology, P.R. China), Chunlei Zhang (Tsinghua University, P.R. China) .....	128
<i>Performance Analysis of a Hybrid-Magnetic-Pole Variable-Flux Machine</i> Faliang Liu (Harbin Institute of Technology, P.R. China), Bin Yu (R&D Center of Electric Machine, P.R. China), Mingqiao Wang (Harbin Institute of Technology, P.R. China), Guangyuan Qiao (Harbin Institute of Technology, P.R. China), Shijie Yang (Harbin Institute of Technology, P.R. China), Ping Zheng (Harbin Institute of Technology, P.R. China) .....	133
<i>DC-link Voltage Control Method for High Speed Motors powered by Z-source Inverter</i> Keyuan Huang (Hunan University, P.R. China), Haokun Wu (Hunan University, P.R. China), Wei Lv (Hunan University, P.R. China), Xiaoling Mo (Hunan University, P.R. China), Shoudao Huang (Hunan University, P.R. China), He Zhao (Hunan University, P.R. China) .....	138
<i>Reduction of Cogging Torque by Notching Groove on Magnets in SMPMSM</i> Tao Hong (School of Electrical Engineering and Automation, Hefei University of Technology, P.R. China), Xiaohua Bao (Hefei University of Technology, P.R. China), Wei Xu (Hefei University of Technology, P.R. China), Jinlong Fang (Hefei University of Technology, P.R. China), Yixiang Xu (School of Electrical Engineering and Automation, Hefei University of Technology, P.R. China) .....	144
<i>Improved Torque Ripple Reduction Method for Surface Mounted Permanent Magnet Motor in Flux-Weakening Region</i> Moustafa Magdi Ismail, Magdi (Electrical and Electronic Engineering, Faculty of Engineering, Minia University & Minia University, Egypt), Wei Xu (Huazhong University of Science and Technology, P.R. China), Yi Liu (Huazhong University of Science and Technology, P.R. China) .....	150
<i>A Novel Hysteresis Current Control Scheme in Synchronous dq-Frame for PMSM</i> Lu Ren (Northwestern Polytechnical University, P.R. China), En Xie (Northwestern Polytechnical University, P.R. China), Yiyun Zhao (Northwestern Polytechnical University, P.R. China), Zhi Zhang (Automation College, P.R. China) .....	156

## Permanent-Magnet Motors and Drives (14-3)

<i>Current Control Methods for Dual Three-Phase Permanent Magnet Synchronous Motors Considering Machine Parameter Asymmetry</i> Hao Ye (Shanghai University, P.R. China), Wenxiang Song (Shanghai University, P.R. China), Zhihuang Ruan (Shanghai University, P.R. China), Yan Yan (Shanghai University, P.R. China) .....	162
<i>Density-Based Topology Optimization of Conductor Paths for Windings in Slotted Electrical Machines</i> Adrien Thabuis (Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland), Xiaotao Ren (Ecole Polytechnique Fédérale de Lausanne, Switzerland), Guillaume Burnand (Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland), Yves Perriard (Laboratory director, Switzerland) .....	168
<i>Improved Predictive Current Control of PMSM with Parameter Robustness</i> Mengxue Zou (Shanghai University, P.R. China), Shuang Wang (Shanghai University, P.R. China), Qi Zhang (Shanghai University, P.R. China), Fei Wang (Shanghai University, P.R. China) .....	174
<i>Model Parameter Online Correction Method of Predictive Current Control for Permanent Magnet Synchronous Motor</i> Xiaoxiao Wang (Hebei University of Technology, P.R. China), Feng Niu (Hebei University of Technology, P.R. China), Xiaoyan Huang (Zhejiang University, P.R. China), Lijian Wu (Zhejiang University, P.R. China), Kui Li (Hebei University of Technology, P.R. China), Youtong Fang (Zhejiang University, P.R. China) .....	180
<i>Analysis of a High-Torque PM Vernier Motor with Thick Embedded Permanent Magnets using the Frozen Permeability Method</i> Yasuhiro Kataoka (Akita Prefectural University, Japan), Yoshitarou Matsushima (Former Shizuoka University, Japan), Yoshihisa Anazawa (Akita Prefectural University, Japan) .....	184
<i>Trajectory Error Eliminates of Input Shaping on X-Y Platform by Phase Error Feedforward Control</i> Yong-ping Sun (Harbin Institute of Technology, P.R. China), Ming Yang (Harbin Institute of Technology, P.R. China), Yang-yang Chen (Harbin Institute of Technology, P.R. China), Jiang Long (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China) .....	190

## Power converters (8-1)

<i>A Power Generation Center with Back-to-back Converter Considering Post-fault Operation for MEA Application</i> Xiaoyu Lang (The University of Nottingham, United Kingdom (Great Britain)), Tao Yang (University of Nottingham, United Kingdom (Great Britain)), Hossein Balaghi Enalou (The University of Nottingham, United Kingdom (Great Britain)), Serhiy Bozhko (The University of Nottingham, P.R. China), Patrick Wheeler (University of Nottingham, United Kingdom (Great Britain)) .....	196
<i>Common Mode Voltage and Neutral Point Potential Optimization Control for a Three-Level NPC Inverter</i> Xiaona Xu (Tsinghua University, P.R. China), Baohui Ma (Tianshui Electric Drive Research Institute Co., LTD, P.R. China), Kui Wang (Tsinghua University, P.R. China), Bo Yang (Xi'an University of Technology, P.R. China), Zedong Zheng (Tsinghua University, P.R. China), Yongdong Li (Tsinghua University, P.R. China) .....	202
<i>A five-level Discontinuous SVPWM for parallel three-level inverters to reduce common mode voltage and output current ripples</i> Weiwei Li (Harbin Institute of Technology, China, P.R. China), Xueguang Zhang (Harbin Institute of Technology (HIT), P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China) .....	207
<i>A Cascaded Extended State Observer for Three-level Back-to-back Converter with Surface Mounted Permanent Magnet Synchronous Motor</i> Guiying Lin (Fuzhou University, P.R. China), Fengxiang Wang (Fuzhou University, P.R. China, P.R. China), Yingjie He (Quanzhou Institute of Equipment Manufacturing, Chinese Academy of Sciences, P.R. China), Jose Rodriguez (Universidad Andres Bello, Chile) .....	213
<i>Research on DC Voltage Utilization Ratio of Inverter SHEPWM Control Method Based on Immune Algorithm</i> Wenyi Zhang (Harbin Engineering University, P.R. China), Xiaolong Li (Harbin Engineering University, P.R. China), Jiaqi Qiao (Harbin Engineering University, P.R. China), Xiaoyan Liu (Harbin Engineering University, P.R. China) .....	219
<i>Full-bridge/Push-pull Bi-directional DC-DC Converter with Integrated magnetism and Synchronous Rectification Technology</i> Liu Boyu (Harbin Institute of Technology, P.R. China), Xiangjun Zhang (Harbin Institute of Technology (HIT), P.R. China) .....	224

## Power converters (8-2)

<i>LLC Converter With an Integrated Planar Matrix Transformer Based on Variable Width Winding</i> Mingcong Dai (Harbin Institute of Technology, P.R. China), Xiangjun Zhang (Harbin Institute of Technology (HIT), P.R. China) .....	229
<i>Design of a Wireless Power Transfer System Based on Dual-Class E Self-Resonant Synchronous Rectifier</i> Hui Li (Harbin Institute of Technology, P.R. China), Xiangjun Zhang (Harbin Institute of Technology (HIT), P.R. China) .....	233
<i>A Novel Single-Phase to Three-Phase AC-AC Converter</i> Jack Y Yang (South Dakota School of Mines and Technology (SDSM&T) & Phase Technologies LLC, USA), Peda Medagam (Phase Technologies LLC & Phase Technologies LLC, USA), Zhengtao Zhu (South Dakota School of Mines and Technology (SDSM&T), USA), Charles Tolle (South Dakota School of Mines and Technology (SDSM&T), USA) .....	239
<i>Active Damping Control Strategy of Third-Harmonic Injection Two-stage Matrix Converter via Modifying Third-Harmonic Injection Reference Current and Output Reference Current</i> Chengjia Lu (Nanjing University of Aeronautics and Astronautics, P.R. China), Bo Zhou (Nanjing University of Aeronautics and Astronautics, P.R. China), Lei Jiaying (Southeast University, P.R. China), Jing Shan (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	243
<i>Loss Evaluation of Low-Loss Boost-Chopper Circuit for Inverter Systems in Air Conditioners</i> Keiichi Ishida (Toshiba Carrier Corporation, Japan) .....	249
<i>Impact of Parasitic Parameters on GaN HEMT Driving Module for Totem-pole Bridgeless PFC Converter</i> Shaobo Liu (Harbin Institute of Technology (HIT) & School of Electrical Engineering and Automation, P.R. China), Binxing Li (Harbin Institute of Technology (HIT) & School of Electrical Engineering and Automation, P.R. China), Rongchi Zhang (School of Electrical Engineering & Automation, Harbin Institute of Technology, P.R. China), Nannan Zhao (Harbin Institute of Technology, P.R. China), Gaolin Wang (Harbin Institute of Technology (HIT) & School of Electrical Engineering and Automation, P.R. China), Junya Huo (Harbin Institute of Technology & Guangdong Midea Air-Conditioning Equipment CO., LTD, P.R. China, P.R. China), Lianghong Zhu (Harbin Institute of Technology & Guangdong Midea Air-Conditioning Equipment CO., LTD, P.R. China, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China), Frede Blaabjerg (Aalborg University, Denmark) .....	253

## Induction Machines and Drives (2-1)

<i>The Optimal "Speed-Torque" Control of Asynchronous Motors in the Field-Weakening Region Based on ADRC and ELM</i> Chenming Qiu (Anhui University, P.R. China), Fang Xie (Anhui University, P.R. China), Qunjing Wang (Anhui University, P.R. China), Kangkang Liang (Anhui University, P.R. China), Wenjie Hong (Anhui University, P.R. China), Hong Jiang (Anhui Zhongci Hi-tech Co., Ltd, P.R. China) .....	259
<i>A Self-tuning Method of Weighting Factor in Model Prediction Control for Indirect Matrix Converter with Induction Motor System</i> Mei Yang (North China University of Technology, P.R. China), Gao Yi (North China University of Technology, P.R. China) .....	265
<i>A Novel Direct Torque Control with or without Duty Ratio Optimization for Induction Motors</i> Xu Wu (Nanjing University of Aeronautics and Astronautics, P.R. China), Wenxin Huang (Nanjing University of Aeronautics and Astronautics, P.R. China), Xiaogang Lin (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	270
<i>Experimental Identification of the Induction Machine Frame Convection Coefficient for Varying Ventilator Speeds</i> Pieter Nguyen Phuc (Ghent University, Belgium), Hendrik Vansompel (Ghent University, Belgium), Dimitar Bozalakov (UGent, Belgium), Kurt Stockman (Ghent University Campus Kortrijk, Belgium), Guillaume Crevecoeur (Ghent University, Belgium) .....	274
<i>Make a Trial Small Three-Phase Squirrel-Cage Induction Motor with Concentrated Winding and Its Basic Characteristics</i> Norihiro Watanabe (Chubu University, Japan), Yasumasa Wada (Chubu University, unknown), Masanori Nakamura (Chubu University, Japan), Isao Hirotsuka (Chubu University, unknown) .....	280
<i>Fault-tolerant Reconfiguration Control for the Open-winding Five-phase Inverter under Semi-controlled Condition</i> Shang Gong (Huazhong University of Science and Technology, P.R. China), Zicheng Liu (Huazhong University of Science and Technology, P.R. China), Dong Jiang (Huazhong University of Science and Technology, P.R. China), Wubin Kong (Huazhong University & Technology, P.R. China), Ronghai Qu (Huazhong University of Science and Technology, P.R. China) .....	285

## AC/DC Machines and Drives (1-1)

<i>Analysis and Control of Current Harmonics in Multiphase Machines in Fault-tolerant Operation against Open-phase Faults</i> Jiawei Sun (Tsinghua University, P.R. China), Zedong Zheng (Tsinghua University, P.R. China), Zicheng Liu (Huazhong University of Science and Technology, P.R. China), Yongdong Li (Tsinghua University, P.R. China) .....	289
<i>Digital Controller Design for Three-Stage Aero Generator Based on Disturbance Observer</i> Jingru Yang (Northwestern Polytechnical University, P.R. China), Shouhong Feng (Northwestern Polytechnical University, P.R. China), Yufeng Wang (Northwestern Polytechnical University, P.R. China), Chao Zhang (AVIC Shaanxi Aero Electric CO., LTD, P.R. China), Weilin Li (Northwestern Polytechnical University, P.R. China) .....	295
<i>Zero-Voltage-Switching Current-Source-Inverter Motor Drives Based on Silicon Carbide Devices</i> Zheng Wang (Southeast University, P.R. China), Yang Xu (Southeast University, P.R. China), Qiuxiao Song (Southeast University, P.R. China), Pengcheng Liu (Southeast University, P.R. China), Ming Cheng (Southeast University, P.R. China), Chenxin Tang (Yancheng Institute of New Energy Vehicles of Southeast University, P.R. China) .....	301
<i>Influence of End-Winding on Optimal Design Parameters for Maximum Torque of DC Excited Flux-Switching Machines</i> Wenting Wang (Zhejiang University, P.R. China), Lijian Wu (Zhejiang University, P.R. China), Jiabei Zhu (Zhejiang University, P.R. China) .....	306
<i>A Novel Modelling Approach of Modular Multi Three-phase Drive System for High Performance Applications</i> Xuchen Wang (University of Nottingham Ningbo China, P.R. China), Chunyang Gu (the University of Nottingham Ningbo, P.R. China), Giampaolo Buticchi (University of Nottingham, P.R. China), He Zhang (University of Nottingham Ningbo China, P.R. China), Chris Gerada (University of Nottingham, United Kingdom (Great Britain)) .....	312
<i>Temperature Field Analysis of Stator Transposition Strand Based on Three-Dimensional Coupled Thermal-fluid Network Model</i> Peipei Yang (Harbin University of Science and Technology, P.R. China), Yanping Liang (Harbin University of Science and Technology, P.R. China), Xu Bian (Harbin University of Science and Technology, P.R. China), Chunlei Zhou (Harbin University of Science and Technology, P.R. China) .....	317

## Transformers (2-1)

<i>Flux-Controlled Methods for Demagnetization of Transformer Iron Core: a Comparative Study</i> Shuo Zhang (Chongqing University, P.R. China), Hao Huang (CHONGQING ELECTRIC POWER COMPANY, P.R. China), Zehong Zhou (CHONGQING ELECTRIC POWER COMPANY, P.R. China), Gang Yang (Chongqing Transmission & Transformation Engineering Co., LTD, P.R. China), Quan Wang (Chongqing Transmission & Transformation Engineering Co., LTD, P.R. China), Jian Qiu (Chongqing Transmission & Transformation Engineering Co., LTD, P.R. China), Shoulong Dong (Chongqing University, P.R. China), Chenguo Yao (Chongqing University, P.R. China) .....	322
<i>A novel unified power quality controller based on magnetic flux compensation control</i> Tingkang Wang (School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, P.R. China), Yuning Hou (Huazhong University of Science and Technology, P.R. China), Haifei Wang (Huazhong University of Science and Technology, P.R. China), MY Xue (Huazhong University of Science and Technology, P.R. China), Jianchun Chen (Huazhong University of Science and Technology, unknown) .....	327
<i>Research on on-line ice-melting technology based on zero sequence reactance integrated device</i> Yabing Zhou (Qingyuan Power Supply Bureau, P.R. China), Xiaoliang Tang (Qingyuan Power Supply Bureau, P.R. China), Yuning Hou (Huazhong University of Science and Technology, P.R. China), Fang Yang (Qingyuan Power Supply Bureau, P.R. China), Haifei Wang (Huazhong University of Science and Technology, P.R. China), Tingkang Wang (School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, P.R. China) .....	333
<i>Coupling Method for Analyzing Temperature Rise in Disc-type Oil-Immersed Transformer Winding</i> Du Jinwen (Beijing Jiaotong University, P.R. China), Huijuan Liu (Beijing Jiaotong University, P.R. China), Zhang Zhenyang (Beijing Jiaotong University, P.R. China) .....	338
<i>Design and Study of Insulation Margin Test System for Direct-type Lead Exit of Ultra-high Voltage Transformer</i> Hanwu Xiong (State Grid Corporation of China, P.R. China), Jiantao Sun (China Electric Power Research Institute, P.R. China), Jinzhong Li (State Grid Corporation of China, P.R. China), Lin Wang (China Electric Power Research Institute, P.R. China), Ke Wanq (China Electric Power Research Institute, P.R. China), Shuqi Zhanq (China Electric Power Research Institute, P.R. China), Huanchao Cheng (China Electric Power Research Institute, P.R. China), Xiaoqi Gong (TBEA Hengyang Transformer Co., Ltd., P.R. China), Wei Hu (TBEA Hengyang Transformer Co., Ltd., P.R. China), Jianyi Wang (China Electric Power Research Institute, P.R. China), Xueli Liu (China Electric Power Research Institute, P.R. China) .....	343
<i>Noise and Vibration Analysis of Dry-Type Power Transformer for Monitoring and Data Mining Applications</i> Chongrag Boonseng (King Mounkut Instituted of Technology Ladkrabang, Bangkok, THAILAND, Thailand), Rapeepornpat Boonseng (King Mongkut's Institute of Technology Ladkrabank, Bangkok, THAILAND, Thailand), Kunyanuth Kularbphettong (Suan Sunandha Rajabhat University, Thailand) .....	348

## Motion Control and Servo Systems (2-2)

<i>High Precision Position Control based on Active Disturbance Rejection Control for Galvanometer Scanner System</i> Wenyuan Qin (Beihang University, P.R. China), Hong Guo (Beihang University, P.R. China), Jinquan Xu (Beihang University, unknown), Lumi Liu (Beijing Institute of Control Engineering, P.R. China) .....	353
<i>Slip Ratio Control for Aircraft Electric Braking System Based on Sliding Mode Control</i> Xu Ji (Northwestern Polytechnical University, P.R. China), Hui Lin (Northwestern Polytechnical University, P.R. China), Suying Zhou (Northwestern Polytechnical University, unknown) .....	357
<i>A Hysteresis Compensation Control Method for Piezoelectric Actuators Based on Truncated Least Squares Support Vector Machine</i> Zhibiao Ma (Beijing Institute of Technology, P.R. China), Xiangdong Liu (Beijing Institute of Technology, P.R. China), Xuefei Mao (Beijing Institute of Technology, P.R. China), Zhen Li (Beijing Institute of Technology, P.R. China) .....	362
<i>Active Compensation of Disturbance of X-Y Motion Platform Based on LADRC</i> Zuochoao Yu (Huaqiao University, P.R. China), Rongkun Wang (Huaqiao University, P.R. China) .....	368
<i>Predictive Contour Control for Multi-axis Motion System with Unified Model</i> Chaolei Ma (Tianjin University, P.R. China), Xiuyun Zhang (Tianjin University, P.R. China), Yan Yan (Zhejiang University, P.R. China), Tingna Shi (Zhejiang University, P.R. China) .....	373
<i>Analysis and Optimization of Servo Motor Control Strategy for Minimally Invasive Surgical Robot</i> Jiaxuan Huang (Harbin Institute of Technology, P.R. China), Chengde Tong (Harbin Institute of Technology, P.R. China), Jiewen Lang (Harbin Institute of Technology, P.R. China), Zihang Yuan (Harbin Institute of Technology, P.R. China), Ping Zheng (Harbin Institute of Technology, P.R. China) .....	378



## Sensorless Control (2-2)

<i>Research on Speed Sensorless Control of Permanent Magnet Linear Synchronous Motor Based on PID Neural Network</i> Fei Man (Huaqiao University, P.R. China), Rongkun Wang (Huaqiao University, P.R. China) .....	384
<i>Comparison Study of MRAS and EEMF-based Sensorless Control for Synchronous Reluctance Motor</i> Peng Sun (Harbin Institute of Technology & Huichuan Technology Co., Ltd., P.R. China), Donglai Zhang (Shenzhen Graduate School of Harbin Institute of Technology, P.R. China), Ziping Bai (Huichuan Technology Co., Ltd., P.R. China), Qingqing Xiao (Huichuan Technology Co., Ltd., P.R. China), Bin Chen (Huichuan Technology Co., Ltd., P.R. China), Zhaokai Yu (Huichuan Technology Co., Ltd., P.R. China) .....	388
<i>Optimization of Rotor Position Observer with BP Neural Network</i> Jiadong Pan (Shenzhen Institutes of Advanced Technology · Chinese Academy of Sciences, P.R. China), Jianing Liang (Shenzhen Institutes of Advanced Technology, P.R. China), Tianfu Sun (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, P.R. China), Hong Wang (Guilin University of Electronic Technology, P.R. China), Gang Xie (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, P.R. China), Yubai Yan (Chinese Academy of Sciences Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, P.R. China) .....	393
<i>Full Speed Range Hybrid Sensorless Control of Permanent Magnet Synchronous Motor Based on Weighting Dual EKF and Signal Injection</i> Jie Li (Xi'an University of Technology, P.R. China), Xiaoxiao Yang (Xi'an University of Technology, P.R. China), Mengqi Zhou (Xi'an University of Technology, P.R. China) .....	399
<i>A Novel Commutation Torque Ripple Suppression Method for Position Sensorless Brushless DC Motor Based on SEPIC Converter and Phase Error Compensation</i> Kaiqi Zhao (Harbin Engineering University, P.R. China), Shu Yang (Harbin Engineering University, P.R. China), Qiang Zhang (Harbin Engineering University, P.R. China) .....	405
<i>Novel test environment for the development of self-sensing piezoelectric actuators</i> Louis A. Masson (Ecole Polytechnique Federale de Lausanne, Switzerland), Xiaotao Ren (Ecole Polytechnique Fédérale de Lausanne, Switzerland), Yves Perriard (Laboratory director, Switzerland) .....	412

## Renewable Energy Systems (4-2)

<i>Analysis of Power Loss and Reliability on Hybrid Modular Multilevel Converter With Redundancy Configuration for Offshore Wind Turbines</i> Xiangjie Xie (Chongqing University, P.R. China), Hui Li (Chongqing University, P.R. China), Yu Hu (Chongqing University, P.R. China), Tian Yang (Chongqing University, P.R. China), You Wu (Chongqing University, P.R. China), Zhaosen Chai (Chongqing University, P.R. China) .....	417
<i>Fault Diagnosis for Blade Mass Imbalance of Wind Turbines in View of Wind Speed Spatiotemporal Distribution</i> Kanru Cheng (North China Electric Power University- Baoding Campus, P.R. China), Wan Shuting (North China Electric Power University, P.R. China), Xiaoling Sheng (North China Electric Power University- Baoding Campus, P.R. China), Xuan Wang (North China Electric Power University- Baoding Campus, P.R. China) .....	423
<i>Distributed Finite-Time Coordination Control System for Economical Operation of Islanded DC Microgrids</i> Mohamed Zaery (Harbin Institute of Technology & Aswan University, P.R. China), Panbao Wang (Harbin Institute of Technology, P.R. China), Wang Wei (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China) .....	429
<i>Structural Approach to Analysis and Design of State-Feedback Active Damping for Grid-Tied Inverters</i> Jianjun Ren (Nanjing University of Aeronautics and Astronautics, P.R. China), Yongqiang Ye (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	435
<i>Model-Free Predictive Current Control of Doubly Fed Induction Generator</i> Yongchang Zhang (North China University of Technology, P.R. China), Tao Jiang (North China University of Technology, P.R. China), Jian Jiao (North China University of Technology, unknown), Wei Xu (Huazhong University of Science and Technology, P.R. China) .....	440
<i>An Enhanced DC-Link Voltage Control Method for High-speed PMSM/G in Flywheel Energy Storage System with Indirect Feedforward of Consumed Power and Speed Compensation</i> Yunlong Chen (Zhejiang University, P.R. China), Jiaqiang Yang (Zhejiang University, P.R. China), Xiang Zhang (University of Nottingham, United Kingdom (Great Britain)) .....	445

## Permanent-Magnet Motors and Drives (14-4)

<i>Analysis of Surface Permanent Magnet-type Vernier Generator</i> Yasuhiro Kataoka (Akita Prefectural University, Japan), Yoshitarou Matsushima (Former Shizuoka University, Japan), Yoshihisa Anazawa (Akita Prefectural University, Japan) .....	451
<i>Improved MRAS Control of Permanent Synchronous Motor Based on a New Reference Model in High Power Inverter</i> Shijiong Zhou (Automation Research and Design Institute of Metallurgical Industry, P.R. China), Chengsheng Wang (Chinese Academy of Sciences, P.R. China), Jun Jiang (Beijing Airtime Intelligent Control Co., LTD., P.R. China), Fan Li (Automation Research and Design Institute of Metallurgical Industry, P.R. China), Qiongtao Yang (Automation Research and Design Institute of Metallurgical Industry, P.R. China), Pan Wang (Beijing Aritime Intelligent Control Co., LTD., P.R. China) .....	457
<i>Analysis and Reduction of Electromagnetic Noise Induced by Dead Time Effect for an Axial-Flux Permanent Magnet Motor</i> Shuguang Zuo (Tongji University, P.R. China), Hao Wu (Tongji University, P.R. China), Yang Liu (Tongji University, P.R. China), Wenzhe Deng (Tongji University, P.R. China) .....	462
<i>Dynamic Balance Consistency Analysis of Permanent Magnet Synchronous Motor Rotor Based on Centrifugal Force</i> Liqin Wu (Harbin Institute of Technology, P.R. China), Qisen Sun (Harbin Institute of Technology, P.R. China), Yan Zhu (Harbin Institute of Technology, P.R. China), Xuerong Ye (Harbin Institute of Technology, P.R. China) .....	468
<i>Loss Analysis of the Permanent Magnet Motor with an Amorphous Stator Core by Considering the Influences of Manufacturing Processes</i> Longfei Zhu (Shenyang University of Technology, P.R. China), Xueyan Han (Shenyang University of Technology, P.R. China), Jianguo Zhu (University of Technology Sydney, Australia), Renyuan Tang (Shenyang University of Technology, P.R. China) .....	473
<i>Topology Optimization for Coils of Electric Machine with Level-set Method</i> Xiaotao Ren (Ecole Polytechnique Fédérale de Lausanne, Switzerland), Adrien Thabuis (Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland), Anouar Belahcen (Aalto University, Finland), Yves Perriard (Laboratory director, Switzerland) .....	479

## Permanent-Magnet Motors and Drives (14-5)

<i>Torque Ripple Reduction Based on Adaptive-Linear-Neuron Algorithm Caused by Offset Errors of Current Measurement</i> Wentao Zhang (Harbin Institute of Technology, P.R. China), Huidong Huang (Harbin Institute of Technology, P.R. China), Yongxiang Xu (Harbin Institute of Technology (HIT), P.R. China), Jibin Zou (Harbin Institute of Technology, P.R. China) .....	483
<i>Simplified Lumped Parameter Thermal Network for Short-Duty Dual Three-Phase Permanent Magnet Machines</i> Paolo Giangrande (University of Nottingham, United Kingdom (Great Britain)), Vincenzo Madonna (University of Nottingham, United Kingdom (Great Britain)), Weiduo Zhao (University of Nottingham Ningbo China, P.R. China), Yinli Wang (University of Nottingham Ningbo China, P.R. China), Chris Gerada (University of Nottingham, United Kingdom (Great Britain)), Michael Galea (University of Nottingham Ningbo China & University of Nottingham, P.R. China) .....	488
<i>Design and Comparative Analysis of a Novel PM Vernier Motor With Trapezoidal Magnets and Flux Barriers for In- wheel Traction Application</i> Yulong Pei (Harbin Institute of Technology (HIT), P.R. China), Yanlei Yu (Harbin Institute of Technology, P.R. China), Feng Chai (Harbin Institute of Technology, P.R. China), Yanjun Yu (Harbin Institute of Technology, P.R. China) .....	494
<i>Noise Suppression Technology for DTP-PMSM Based on Dual Random Modulation Strategy</i> Jian Liu (Shandong University of Technology & School of Electrical and Electronic Engineering, P.R. China), Bo Zhao (Shandong University of Technology, P.R. China), Xin-wei Wang (Shandong University of Technology, P.R. China), Dun-xin Bian (Shandong University of Technology, P.R. China), Sheng-tong Sun (Shandong University of Technology, P.R. China) .....	500
<i>High-Fidelity Model for Interior Permanent Magnet Synchronous Machines Considering the Magnet Saturation and Spatial Harmonics Based on Deep Neural Network</i> Kuiqing Zhang (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, P.R. China), Tianfu Sun (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, P.R. China), Gang Xie (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, P.R. China), Junjie Zhang (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, P.R. China), Guangyang Xiong (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, P.R. China), Jianing Liang (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, P.R. China), Shaojia He (Guilin University of Electronic Technology, P.R. China) .....	505

## Permanent-Magnet Motors and Drives (14-6)

<i>Model Predictive Control of a Twelve-Phase PMSM with Simplified Cost Function</i> Biyang Chen (Tsinghua University, P.R. China), Jingliang Lv (Tsinghua University, P.R. China), Xinjian Jiang (Tsinghua University, P.R. China), Yanwen Zheng (Shenyang Yuanda Power Electronics Science & Technology Co., Ltd, P.R. China) .....	510
<i>Control Strategy of Dual Three-phase Permanent Magnet Synchronous Motor Based on Cross Decoupling</i> Mengyang Li (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	515
<i>A Position Sensorless Strategy for Surface-mounted Permanent-magnet Synchronous Motors Based on Asymmetric Inductance</i> Siheng Zhong (Quanzhou Institute of Equipment Manufacturing, Haixi Institutes, Chinese Academy of Sciences & Institute of Electrical Drives and Actuators, Universitaet der Bundeswehr Muenchen, P.R. China), Zhenchuan Shi (Quanzhou Institute of Equipment Manufacturing, P.R. China), Shengnan Zou (Quanzhou Institute of Equipment Manufacturing, P.R. China), Dieter Gerling (University of Federal Defence Munich, Germany), Wei Xie (Quanzhou Institute of Equipment Manufacturing, P.R. China) .....	520
<i>Advanced Flux-weakening Strategy Based on Single Current Regulator for Permanent Magnet Synchronous Motors</i> Wei Chen (Shanghai STEP Electric Corporation, P.R. China) .....	525
<i>Research on Torque Ripple of Multi-Phase PM Machine under Fault-Tolerant Condition</i> Zuosheng Yin (Harbin Institute of Technology, P.R. China), Yi Sui (Harbin Institute of Technology, P.R. China), Jiaxuan Huang (Harbin Institute of Technology, P.R. China), Jiaqi Liu (Harbin Institute of Technology, P.R. China), Ping Zheng (Harbin Institute of Technology, P.R. China) .....	530
<i>Performance Comparison Between Ferrite-ASynRM and Interior PM Machine Drives for Traction Applications</i> Yibo Ge (Nanjing Engineering Institute of Aircraft Systems & Aviation Key Laboratory of Science and Technology on Aero Electromechanical System Integration, P.R. China), Yaohua Hu (Nanjing Engineering Institute of Aircraft Systems & Aviation Key Laboratory of Science and Technology on Aero Electromechanical System Integration, P.R. China), Shushu Zhu (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	535

## Power converters (8-3)

<i>Synchronous Rectification Control Strategy for Bidirectional Full-bridge LLC Resonant Converter</i> Fengyi Zhang (School of Electrical Engineering, Shandong University, P.R. China), Yubin Wang (School of Electrical Engineering, Shandong University, P.R. China), Fan Wang (School of Electrical Engineering, Shandong University, P.R. China), Jia Ming (School of Electrical Engineering, Shandong University, P.R. China) .....	541
<i>A Series-connected 18-pulse Rectifier Using Isolated Transformer</i> Quanhui Li (Harbin Institute of Technology, P.R. China), Fangang Meng (Harbin Institute of Technology, P.R. China), Huaqiang Zhang (Harbin Institute of Technology (Weihai), P.R. China) .....	547
<i>A Series-connected 12-pulse Rectifier Based on Power Electronic Phase-shifting Transformer</i> Fangang Meng (Harbin Institute of Technology, P.R. China), Tong Jiang (Harbin Institute of Technology, P.R. China), Lei Gao (Harbin Institute of Technology, P.R. China) .....	552
<i>Analytical Model of Series-Connected 12-Pulse Rectifier with Constant-Voltage Load</i> Qingxiao Du (Harbin Institute of Technology, P.R. China), Fangang Meng (Harbin Institute of Technology, P.R. China), Lei Gao (Harbin Institute of Technology, P.R. China) .....	557
<i>Double-Star Uncontrolled Rectifier Based on Power Electronic Transformer</i> Fangang Meng (Harbin Institute of Technology, P.R. China), Yining Guo (Harbin Institute of Technology, P.R. China), Lei Gao (Harbin Institute of Technology, P.R. China) .....	563
<i>A Constant Current Control Strategy for Transmitter of Three-phase Dynamic Wireless Power Transmission System to Suppress Input Voltage Fluctuation</i> Jialu Li (Harbin Institute of Technology & Institute of Electromagnetics and Electronics, P.R. China), Xin Gao (Harbin Institute of Technology, P.R. China), Shuai Dong (Harbin Institute of Technology, P.R. China), Shumei Cui (Harbin Institute of Technology, P.R. China) .....	568

## Power converters (8-4)

<i>Energy Analysis-Based Approach to Identification of Equivalent Resistance and Parameter Nonlinearity for Power Converters</i> Qiang Zhang (Harbin Engineering University, P.R. China), Baocheng Wu (Harbin Engineering University, P.R. China), Jiazhi Wei (Harbin Engineering University, P.R. China), Tonghe Dong (Harbin Engineering University, P.R. China) .....	572
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

<i>Control Strategy of Loss Balance on the IGCT-Based Large Power Three-level Active Neutral-Point-Clamped Converter</i> Ming Li (Automation Research and Design Institute of Metallurgical Industry, P.R. China), Chunyi Zhu (Automation Research and Design Institute of Metallurgical Industry, P.R. China) .....	577
<i>Research on Small-Size Closed-Loop Fluxgate Transducer for Current Sensor Applications</i> Wang Liang (Shenzhen Graduate School of Harbin Institute of Technology, P.R. China) .....	583
<i>A Droop Control Strategy Based on Synchronous Rectifier to Modulate Frequency and Voltage in the Ac Microgrid</i> Jian Xu (Nanjing University of Aeronautics and Astronautics, P.R. China), Xin Cao (Nanjing University of Aeronautics and Astronautics, P.R. China), Zhenyang Hao (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	587
<i>A Coordination Control Strategy for An Isolated Bidirectional AC/DC Matrix Converter</i> Mei Yang (North China University of Technology, P.R. China), Ziyu Liu (North China University of Technology, P.R. China), Weichao Huang (North China University of Technology, P.R. China) .....	592
<i>Neutral-Point Oscillation Suppression for Vienna Rectifier Based on Small DC-Link Capacitor</i> Shixin Yue (Zhejiang University, P.R. China), Yu Ji (State Grid Nantong Power Supply Company, P.R. China), Wenxi Yao (Zhejiang University, P.R. China) .....	597

## Induction Machines and Drives (2-2)

<i>A Robust Model-Free Predictive Current Control of Induction Motor Drives</i> Yongchang Zhang (North China University of Technology, P.R. China), Xing Wang (North China University of Technology, P.R. China), Boyue Zhang (North China University of Technology, P.R. China), Haitao Yang (North China University of Technology, P.R. China) .....	603
<i>A Method for Improving Power Factor in High Power Inverter-fed Induction Motor by the Use of Rotor Convex Copper Bar</i> Yixiang Xu (School of Electrical Engineering and Automation, Hefei University of Technology, P.R. China), Xiaohua Bao (Hefei University of Technology, P.R. China), Wei Xu (Hefei University of Technology, P.R. China), Jinlong Fang (Hefei University of Technology, P.R. China), Tao Hong (School of Electrical Engineering and Automation, Hefei University of Technology, P.R. China) .....	608
<i>Hardware-in-the-Loop Real-time Simulation for Speed-Sensorless Vector Control of High-Power Induction Motor</i> Yongchang Zhang (North China University of Technology, P.R. China), Peng Huang (North China University of Technology, P.R. China), Haitao Yang (North China University of Technology, P.R. China) .....	613
<i>Fault-tolerant Control of a 15-phase Induction Machine with Non-sinusoidal Supply under Open-circuited Fault Conditions</i> Xiaoqin Zheng (Qingdao University, P.R. China), Xinzhen Wu (Qingdao University, P.R. China), Xinqiang Yi (Naval University of Engineering, P.R. China), Haitao Liu (Naval University of Engineering, P.R. China), Ronggang Ni (Qingdao University, P.R. China) .....	618
<i>The Effect of Stator Inter-Turn Short Circuit Faults on Electromagnetic Performances of Induction Motors</i> Peng Chen (Harbin University of Science and Technology, P.R. China), Ying Xie (Harbin University of Science and Technology, P.R. China), Shengming Hu (Harbin University of Science and Technology, P.R. China) .....	622
<i>Design and Performance Analysis of High-Speed Induction Motor Drives Based on SiC Device</i> Zeyu He (Huazhong University of Science and Technology, P.R. China), Yang Liu (Huazhong University of Science and Technology, P.R. China), Weikang Wang (Huazhong University of Science and Technology, P.R. China), Jin Zhao (Huazhong University of Science and Technology, P.R. China) .....	627

## Synchronous Machines and Drives (1-1)

<i>An improved end-winding leakage inductance calculation method based on frozen permeability for large synchronous condenser</i> Jianfu Li (Chongqing University & Dongfang Electric Machinery Co., Ltd, P.R. China), Hui Li (Chongqing University, P.R. China), Youbin Zhou (State Grid Hubei Electric Power Company Electric Power Research Institute, P.R. China), Tao Wang (State Grid Hubei Electric Power Company Electric Power Research Institute, P.R. China), Bin Yuan (Chongqing University, P.R. China), Xiao Wang (Chongqing University, P.R. China), Guanghou Zhou (Dongfang Electric Machinery Co., Ltd, P.R. China) .....	632
<i>Torque Analysis of the Hysteresis Motor with Over-excitation Using Play Model</i> Kazumi Kurihara (Ibaraki University, Japan), Naoki Kurihara (East Japan Railway Company, Japan), Tomotsugu Kubota (Ibaraki University, Japan) .....	637

<i>Analysis of Distributed Air Gap Parameters of Differential Mode Inductor Considering Core Loss and Saturation</i> Shicheng Hao (Nanjing University of Aeronautics and Astronautics, P.R. China), Zhuoran Zhang (Nanjing University of Aeronautics and Astronautics, P.R. China), Jincai Li (Nanjing University of Aeronautics and Astronautics, P.R. China), Jianbin Han (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	643
<i>Current Injection-based Simultaneous Stator Winding and PM Temperature Estimation for Dual Three-phase PMSMs</i> Ze Li (University of Windsor, Canada), Guodong Feng (University of Windsor, Canada), Chunyan Lai (Concordia University, Canada), Wenlong Li (University of Windsor, unknown), Narayan Kar (University of Windsor, Canada) .....	648
<i>Analysis of Magnetic Flux Density of Air Gap in Turbo-Generators Using Equivalent Magnetic Network Method</i> Linlin Zhang (Harbin University of Science and Technology, P.R. China), Yanping Liang (Harbin University of Science and Technology, P.R. China), Xu Bian (Harbin University of Science and Technology, P.R. China), Lianlian Gao (Harbin University of Science and Technology, P.R. China), Dongmei Wang (Harbin University of Science and Technology, P.R. China) .....	654
<i>Novel Optimization Evaluation of the Asymmetric-paths Winding considering the Electromagnetic Force Characteristics in AC Machines</i> Yanping Liang (Harbin University of Science and Technology, P.R. China), Zhongqi Guo (Harbin University of Science and Technology, P.R. China), Xu Bian (Harbin University of Science and Technology, P.R. China), Chengguang Wang (Harbin University of Science and Technology, P.R. China), Dongmei Wang (Harbin University of Science and Technology, P.R. China), Lianlian Gao (Harbin University of Science and Technology, P.R. China) .....	659

## Transformers (2-2)

<i>The Temperature Variation Characteristic Analysis Based on the Electromagnetic-Thermal Coupled Method for the Dry-type Transformer</i> Na Li (Shandong University, P.R. China), Yuanyuan Sun (Shandong University, P.R. China, Canada), Yiru Hu (China National Offshore Oil Corporation, P.R. China), Lina Zhang (China National Offshore Oil Corporation, P.R. China), Hui Zhong (Shandong University, P.R. China), Erdong Wang (Shandong University, P.R. China) .....	665
<i>Research on Overload Capability of Oil-immersed Distribution Transformer Based on Hot Spot Temperature Model</i> Haifei Wang (Huazhong University of Science and Technology, P.R. China), MY Xue (Huazhong University of Science and Technology, P.R. China), Tingkang Wang (School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, P.R. China), Yuning Hou (Huazhong University of Science and Technology, P.R. China), Jianchun Chen (Huazhong University of Science and Technology, unknown), Jianming Sun (China Railway Fourth Survey and Design Institute Group Company Limited, P.R. China) .....	670
<i>Design of a Contactless Power Transfer Device with Signal Transmission</i> Yuanzhi Zhang (Huazhong University of Science and Technology, P.R. China), Jichang Yang (Huazhong University of Science and Technology, P.R. China), Dong Jiang (Huazhong University of Science and Technology, P.R. China), Dawei Li (Huazhong University of Science & Technology, P.R. China), Ronghai Qu (Huazhong University of Science and Technology, P.R. China) .....	675
<i>Vibration Analysis of Transformer Windings under DC Bias Based on Finite Element Method</i> Shuyi Lv (Shanghai University of Electric Power, P.R. China), Ye Liu (Shanghai University of Electric Power, P.R. China) .....	680
<i>Study of High Frequency Rotary Transformer Structures for Contactless Inductive Power Transfer</i> Xu Zu (University of Shanghai for Science and Technology, P.R. China), Quan Jiang (University of Shanghai for Science and Technology, P.R. China) .....	686
<i>Reactive Power Optimization of Active Distribution Network under Parallel Condition of Solid State Transformer and On-Load Tap Changer</i> Jiyong Shi (Tianjin University, P.R. China), Wenjing Yang (Tianjin University, P.R. China), Fei Xue (Ningxia Electric Power Limited Company, P.R. China), Wen Qiao (Tianjin University, P.R. China), Ting Yang (Tianjin University, P.R. China), Jiaqi Wang (Tianjin University, P.R. China) .....	691

## SS: Direct Drive and Magnetic Levitation Technologies (TB)

<i>Modeling and Analysis of a Large-Load Magnetic Levitation Gravity Compensator</i> He Zhang (Harbin Institute of Technology, P.R. China), Baoquan Kou (School of Electrical Engineering and Automation, Harbin Institute of Technology, P.R. China), Yiheng Zhou (Harbin Institute of Technology, P.R. China), Yanjie Liu (Harbin Institute of Technology, P.R. China), Qingwen Ge (Harbin Institute of Technology, P.R. China), Yi Shao (Harbin Institute of Technology, P.R. China) .....	697
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

<i>Robustness Improvement of Two-Vector-Based Model Predictive Current Control for Permanent Magnet Synchronous Motor</i>	
Wenxiang Zhao (University of Jiangsu, P.R. China)	702
<i>PID Parameters optimization of PMSLM servo system based on Improved Differential Evolution</i>	
Ming Li (Anhui University, P.R. China), Jiwen Zhao (HeFei University of Technology, P.R. China), Lijun Wang (Anhui University, P.R. China), Yuepeng Hu (Anhui University, P.R. China), Zhen Wang (Anhui University, P.R. China), Juncai Song (Anhui University, unknown)	707
<i>Thrust Performance Improvement in Permanent Magnet Synchronous Linear Motor Based on Double-layer Skewed Coil</i>	
Weitao Wang (Anhui University, P.R. China), Jiwen Zhao (HeFei University of Technology, P.R. China), Juncai Song (Anhui University, unknown), Fei Dong (Anhui University, P.R. China), Zhongyan He (Anhui University, P.R. China), Yang Yang (Anhui University, P.R. China)	712
<i>Analytical Calculation of Braking Force of Super-high Speed Maglev Eddy Current Braking System</i>	
Chuntao Chen (Qingdao University, P.R. China), Jie Xu (Naval University of Engineering, P.R. China), Xinzhen Wu (Qingdao University, P.R. China)	717
<i>Optimization of Fuzzy Sliding Mode Controller with Improved Genetic Algorithm</i>	
Liang Guo (Zhejiang Sci-Tech University, P.R. China), Chao Zheng (Zhejiang Sci-Tech University, P.R. China)	722
<i>Modelling of a Dual-side Excited Transverse Flux Permanent Magnet Linear Motor</i>	
Jun Luo (Harbin Institute of Technology, P.R. China), Baoquan Kou (School of Electrical Engineering and Automation, Harbin Institute of Technology, P.R. China), Xiaobao Yang (Harbin Institute of Technology, P.R. China), Lu Zhang (Harbin Institute of Technology, P.R. China)	727
<i>Analysis and Optimization on Armature Reaction of a Rotary-Linear Voice Coil Motor</i>	
Meizhu Luo (Central South University, P.R. China), Zijiao Zhang (Hunan University, P.R. China), Chaoqun Luo (PetroChina Qinghai Oilfield Company, P.R. China)	732
<i>Magnetic-Thermal Coupled Analysis of Eletromagnets for Medium-speed Maglev Train</i>	
Jiuding Zhang (Zhejiang University, P.R. China), Qinfen Lu (Zhejiang University, P.R. China)	736
<i>Investigation of Electromagnetic Coupling Field of Traction and Levitation Systems in High Speed Maglev Train</i>	
Longxiang Li (Zhejiang University, P.R. China), Jiuding Zhang (Zhejiang University, P.R. China), Qinfen Lu (Zhejiang University, P.R. China)	741
<i>A Novel Linear Hybrid-Excited Slot Permanent Magnet Machine with DC-Biased Sinusoidal Current</i>	
Qinfen Lu (Zhejiang University, P.R. China), Yiming Shen (Zhejiang University, P.R. China)	747
<i>A Novel Differential Estimation Method of Rotor Displacement for Active Magnetic Bearings</i>	
Jie Yu (Qingdao University, P.R. China), Xinzhen Wu (Qingdao University, P.R. China), Yuhao Zhang (State Grid Shandong Maintenance Company, P.R. China), Jiankun Li (Qingdao University, P.R. China), Ronggang Ni (Qingdao University, P.R. China)	752
<i>Design and Analysis of a Novel Linear Vernier Motor with Split Tooth Structure</i>	
Yi Shao (Harbin Institute of Technology, P.R. China), Baoquan Kou (Harbin Institute of Technology, P.R. China), He Zhang (Harbin Institute of Technology, P.R. China), Xiaobao Yang (Harbin Institute of Technology, P.R. China)	757

## SS: Design, Control and Applications of Dual-Port Electrical Machines and Systems (TA)

<i>Application of Brushless Doubly-Fed Machine system in Hydropower Generation</i>	
Jing Chen (Huazhong University of Science and Technology, P.R. China), Xuefan Wang (Huazhong University of Science and Technology, P.R. China), Tantan Zhao (Huazhong University of Science and Technology, P.R. China), Zhenping Li (Huazhong University of Science and Technology, unknown), Ming Kong (EAST Group Co., Ltd., P.R. China), Pengcheng Nie (Huazhong University of Science and Technology, P.R. China)	761
<i>Research on Brushless Doubly-Fed Motor for Direct-drive Screw Pump</i>	
Tantan Zhao (Huazhong University of Science and Technology, P.R. China), Xuefan Wang (Huazhong University of Science and Technology, P.R. China), Jinfei Yao (Huazhong University of Science and Technology, P.R. China), Zhenping Li (Huazhong University of Science and Technology, unknown), Ming Kong (EAST Group Co., Ltd., P.R. China), Pengcheng Nie (Huazhong University of Science and Technology, P.R. China)	765
<i>Modulation and Control of a 3L-ANPC/H-Bridge Hybrid Inverter for Ship Electric Propulsion</i>	
Xu Xiaohui (National Key Lab. of Science and Technology on Vessel Integrated Power System, P.R. China, P.R. China), Nianzhou Liu (National Key Lab. of Science and Technology on Vessel Integrated Power System, P.R. China), Kui Wang (Tsinghua University, P.R. China), Zedong Zheng (Tsinghua University, P.R. China), Yongdong Li (Tsinghua University, P.R. China)	769

<i>Fault-Tolerant Control for Open-Circuit Fault of Power Switch in Dual-Winding Permanent-Magnet Motor Drive System</i> Xuefeng Jiang (Nanjing University of Science and Technology, P.R. China), Yunzhi Li (Nanjing University of Science and Technology, P.R. China), Shaoshuai Wang (Nanjing University of Science and Technology, P.R. China), Yufei Gao (Nanjing University of Science and Technology, P.R. China), Ran Tang (Nanjing University of Science and Technology, P.R. China) .....	774
<i>A Robust Grid Synchronization Method for Cascaded Brushless Doubly Fed Induction Generator</i> Xiaoming Yan (Southeast University, P.R. China), Ming Cheng (Southeast University, P.R. China) .....	779
<i>Design and Research of A New Soft-Starting Brushless Doubly-Fed Motor</i> Chaohao Kan (Hefei University of Technology, P.R. China), Xiao Li (Hefei University of Technology, P.R. China), Ke Jin (Hefei University of Technology, P.R. China), Xichang Bao (Hefei University of Technology, P.R. China), Jie Zheng (Hefei University of Technology, P.R. China) .....	785
<i>The Soft-Starting Method for Brushless Doubly-Fed Motor</i> Chaohao Kan (Hefei University of Technology, P.R. China), Ke Jin (Hefei University of Technology, P.R. China), Xiao Li (Hefei University of Technology, P.R. China), Xichang Bao (Hefei University of Technology, P.R. China), Jie Zheng (Hefei University of Technology, P.R. China) .....	790
<i>Research on the Control Strategy Based on Peak-Prediction for the Pulse Power Supply</i> Xiao Zhang (Naval University of Engineering, P.R. China), Junyong Lu (Naval University of Engineering, P.R. China), Yufeng Dai (National Key Laboratory of Science and Technology on Vessel Integrated Power System, P.R. China), Wenxuan Wu (Naval University of Engineering, P.R. China), Xin Wang (Naval University of Engineering, P.R. China), Tao Ma (Naval University of Engineering, P.R. China) .....	795
<i>Research on Direct Power Control for Open-Winding Brushless Doubly-Fed Reluctance Wind Power Generator with Fault-Tolerant Strategy</i> Liancheng Zhu (University of Science and Technology Liaoning, P.R. China), Yin Li (University of Science and Technology Liaoning, P.R. China), Anran Chen (University of Science and Technology Liaoning, P.R. China), Wansheng Cheng (University of Science and Technology Liaoning, P.R. China), Yuxin Wang (Shenyang Open University, P.R. China), Sul Ademi (University of Warwick, United Kingdom (Great Britain)) .....	799
<i>A Direct Control for Stand-Alone Operation Brushless Doubly Fed Induction Generator Using Sliding-Mode Control Approach</i> Kai Ji (Wuhan Institute of Marine Electric Propulsion, P.R. China), Wenfeng Long (Wuhan Institute of Marine Electric Propulsion, P.R. China), Jinping He (Science and Technology on Ship Integrated Power System Technology Laboratory, Wuhan, P.R. China) .....	804

## SS: Emerging Electric Machines and Drives for Electrified Applications (TA)

<i>Fault-Tolerant Control for Short-Circuit Fault of Power Switch in Dual-Winding Permanent-Magnet Motor Drive System</i> Xuefeng Jiang (Nanjing University of Science and Technology, P.R. China), Yufei Gao (Nanjing University of Science and Technology, P.R. China), Shaoshuai Wang (Nanjing University of Science and Technology, P.R. China), Yunzhi Li (Nanjing University of Science and Technology, P.R. China) .....	810
<i>An Integrated Drive Power Converter Topology for Plug-in Hybrid Electric Vehicle with G2V, V2G and V2H Functions</i> He Cheng (China University of Mining and Technology, P.R. China), Hao Chen (China University of Mining and Technology, P.R. China), Qing Wang (NANCHANG University, P.R. China) .....	815
<i>Design and Analysis of a New Consequent-pole Permanent-magnet Servo Motor based on Field Modulation</i> Yeyi Mei (Southeast University, P.R. China), Ying Fan (Southeast University, P.R. China), Qiushi Zhang (Southeast University, P.R. China), Guangyu Qu (Southeast University, P.R. China), Chenyang Mao (Southeast University, P.R. China) .....	821
<i>Optimization Design of a Dual-Rotor Axial-Flux permanent Magnet Vernier Machine Based on Genetic Algorithm</i> Kuang Yang (Harbin Institute of Technology (Shenzhen), P.R. China), Fei Zhao (Harbin Institute of Technology (Shenzhen), P.R. China), Quanlin Wang (Harbin Institute of Technology (Shenzhen), P.R. China), Hai Lin (Chang'an University, P.R. China) .....	826
<i>Comparative Study of Linear Primary Permanent-Magnet Vernier Machine and Conventional Linear Permanent-Magnet Machine</i> Huan Zhong (Jiangsu University, P.R. China), Guohai Liu (Jiangsu University, P.R. China), Liang Xu (Jiangsu University, P.R. China) .....	831
<i>A Novel Dual-Rotor Permanent Magnet Synchronous Reluctance Machine with High Electromagnetic Performance</i> Zhiyuan Zhang (School of Electrical Engineering, Shandong University, P.R. China), Yan Liu (School of Electrical Engineering, Shandong University, P.R. China), Wenliang Zhao (Shandong University, P.R. China), Xiuhe Wang (Shandong University, P.R. China), Byung-il Kwon (Hanyang University, Korea) .....	836

## SS: Emerging Flux Modulation Multi-Port Systems (TB)

<i>A Novel DC Bias Excited Machine with Integrated Winding</i>	
Shuangxia Niu (The Hong Kong Polytechnic University, Hong Kong), Qingsong Wang (University of British Columbia, Canada), Xing Zhao (The Hong Kong Polytechnic University, Hong Kong) .....	841
<i>Investigation of a Partitioned-stator Hybrid-excited Flux-switching Permanent Magnet Machine with Consequent Poles</i>	
Lei Xu (Jiangsu University, P.R. China), Wenjie Fan (Jiangsu University, P.R. China), Shiyue Zheng (Jiangsu University, P.R. China), Jiqi Wu (Jiangsu University & School of Electrical and Information Engineering, P.R. China), Yifeng Hua (Jiangsu University, P.R. China), Shanshan Zhou (Jiangsu University, P.R. China) .....	846
<i>Novel Hybrid-excited Permanent Magnet Machine Based on the Flux Modulation Effect</i>	
Yulong Liu (Huaqiao University, P.R. China), Xiaodong Zhang (Shenzhen In Drive Amperex Co. Ltd, P.R. China), Shuangxia Niu (The Hong Kong Polytechnic University, Hong Kong), Wai-lok Chan (The Hong Kong Polytechnic University, Hong Kong), Weinong Fu (The Hong Kong Polytechnic University, P.R. China) .....	851

## SS: Emerging Flux Modulation Multi-Port Systems (TC)

<i>Performance Comparison of Dual-Sided Permanent Magnet Machines with Different Stator Magnet Arrangements</i>	
Ya Li (School of Electrical Engineering, Southeast University, P.R. China), Hui Yang (Southeast University, P.R. China), Heyun Lin (Southeast University, P.R. China) .....	856
<i>A Novel Stator PM Dual-mechanical-port Dual-electrical-port Machine</i>	
Xiang Ren (Huazhong University of Science and Technology, P.R. China), Dawei Li (Huazhong University of Science & Technology, P.R. China), Ronghai Qu (Huazhong University of Science and Technology, P.R. China), Yuanzhi Zhang (Huazhong University of Science and Technology, P.R. China), Haiyang Fang (Huazhong University of Science and Technology, P.R. China), Ziyi Liang (Huazhong University of Science and Technology, P.R. China) .....	862

## SS: High Speed Permanent Magnet Machine for Electrified Vehicles (TD)

<i>Rotor Design of High Power High Speed Permanent Magnet Machine Considering Multiphysics Constraints</i>	
Guanghui Du (Huazhong University of Science & Technology, P.R. China), Wei Xu (Huazhong University of Science and Technology, Wuhan, P.R. China), Na Huang (CRRC Yongji Electric CO. LTD, P.R. China), Xin Cheng (Shanghai University of Engineering Science, P.R. China) .....	868
<i>Reduction of Iron Loss in a V-Shaped IPM Machine for Traction Applications</i>	
Zhiyong Ma (The Fourth Representative Office of the Navy in Nanjing, P.R. China), Yaohua Hu (Nanjing Engineering Institute of Aircraft Systems & Aviation Key Laboratory of Science and Technology on Aero Electromechanical System Integration, P.R. China), Chen Can (The Fourth Representative Office of the Navy in Nanjing, P.R. China) .....	873
<i>Multi-Physical Field Optimization Analysis of High-Speed Permanent Magnet Synchronous Motor Based on NSGA-II Algorithm</i>	
Shaopeng Wu (Harbin Institute of Technology & Institute of Electromagnetic and Electronic Technology, P.R. China), Xiaojian Huang (Harbin Institute of Technology, P.R. China), Chenchen Tian (Harbin Institute of Technology, P.R. China), Pinjia Zhang (Tsinghua University, P.R. China) .....	879
<i>Thermal design and optimization of a water-cooling permanent magnet synchronous in-wheel motor</i>	
Peixin Liang (Northwestern Polytechnical University, P.R. China), Feng Chai (Harbin Institute of Technology, P.R. China), Ke Shen (Northwestern Polytechnical University, P.R. China), Weiguo Liu (Northwestern Polytechnic University, P.R. China) .....	885
<i>Electrically Excited Synchronous Machine with Additional Permanent Magnets for Traction Application</i>	
Hongfei Lu (Karlsruhe Institute of Technology, Germany), Martin Doppelbauer (Karlsruhe Institute of Technology, Germany) .....	891
<i>Accurate Modeling and Performance Analysis of Synchronous Reluctance Motor Considering Amorphous Alloy Properties</i>	
Zongyang Li (Harbin Institute of Technology, P.R. China), Yulong Pei (Harbin Institute of Technology (HIT), P.R. China), Feng Chai (Harbin Institute of Technology, P.R. China), Huiying Hu (CRRC Changchun Railway Vehicles Co., Ltd, P.R. China), Yuehong Wu (Harbin Institute of Technology, P.R. China), Yanlei Yu (Harbin Institute of Technology, P.R. China) .....	897



<i>Novel Partitioned Stator Dual-PM Flux-Switching Permanent Magnet Machine with Mechanically Continuously Flux Adjusting Capability</i>	
Liang Li (Huazhong University of Science and Technology, P.R. China), Dawei Li (Huazhong University of Science & Technology, P.R. China), Ronghai Qu (Huazhong University of Science and Technology, P.R. China)	903

## SS: Linear Motors and Drives (TC)

<i>A Hall Sensor-Based Position Estimation Method for PMLSM with an Improved Phase Locked Loop</i>	
Mingyi Wang (Harbin Institute of Technology, P.R. China), Yujie Niu (Harbin Institute of Technology, P.R. China), Yongbin Tang (China Aerospace Science and Industry Corporation, P.R. China), Rui Yang (Harbin Institute of Technology, unknown), Chengbao Zhong (State Key Laboratory of Air-conditioning Equipment and System Energy Conservation, P.R. China), Liyi Li (Harbin Institute of Technology (HIT), P.R. China)	907
<i>Super Twisting-Based Position Control of PMLSM with Load Force Observer</i>	
Jialin Jiang (Harbin Institute of Technology, unknown), Mingyi Wang (Harbin Institute of Technology, P.R. China), Yongbin Tang (China Aerospace Science and Industry Corporation, P.R. China), Chengbao Zhong (State Key Laboratory of Air-conditioning Equipment and System Energy Conservation, P.R. China), Liyi Li (Harbin Institute of Technology (HIT), P.R. China)	912
<i>Optimization Design of the Secondary Plate Slot Structure of Single-sided Linear Induction Motor</i>	
Zheng Li (Hebei University of Science and Technology, P.R. China), Yu Xiao (Hebei University of Science and Technology, P.R. China), Shuo Zhou (Hebei University of Science and Technology, P.R. China), Leiyong Wang (Hebei University of Science and Technology, P.R. China)	916
<i>Improved.Relative.Coupling.Control.with.Second-Order.Consensus.Compensation.for.Multi-PMSMs</i>	
Can Li (Shenzhen University, P.R. China), Can Wang (Shenzhen University, P.R. China), Jianfei Pan (Shenzhen University, P.R. China), Shuangxia Niu (The Hong Kong Polytechnic University, Hong Kong), Pengfei Fu (Shenzhen University, P.R. China), Lun He (Shenzhen University, P.R. China)	921
<i>Characteristics and Optimization of a Bilateral Linear Permanent-Magnet-Assisted Synchronous Reluctance Motor with Compact Secondary Structure</i>	
Yu Hanchuan (Nanjing University of Aeronautics and Astronautics Jiangsu Province, P.R. China), Xuzhen Huang (Nanjing University of Aeronautics and Astronautics, P.R. China), Zhuoran Zhang (Nanjing University of Aeronautics and Astronautics, P.R. China), Jin Liang (Nanjing University of Aeronautics and Astronautics, P.R. China)	927
<i>Thrust Optimization of Double Primary Tubular Linear Synchronous Motor Based on Neural Network Surrogate Model</i>	
Tianpeng Ji (Nanjing University of Aeronautics and Astronautics, P.R. China), Xuzhen Huang (Nanjing University of Aeronautics and Astronautics, P.R. China), Wenshuai Zhou (Nanjing University of Aeronautics and Astronautics, P.R. China)	932
<i>High Precision Six-Degree-of-Freedom Planar Motor Control Method Based on Sliding Mode Control Theory</i>	
Junchi Li (Harbin Institute of Technology, P.R. China), Mingyi Wang (Harbin Institute of Technology, P.R. China), Yongbin Tang (China Aerospace Science and Industry Corporation, P.R. China), Rui Yang (Harbin Institute of Technology, unknown), Chengbao Zhong (State Key Laboratory of Air-conditioning Equipment and System Energy Conservation, P.R. China), Liyi Li (Harbin Institute of Technology (HIT), P.R. China)	938
<i>Detent Force Suppression of Double-Sided PM Linear Synchronous Motor with V-Shaped Magnets Arrangement</i>	
Libing Jing (China Three Gorges University, P.R. China), Mingna Ma (HeFei University of Technology, P.R. China), Wei Tao (Hefei University of Technology, P.R. China), Zhengyang Xu (Hefei University of Technology, P.R. China), Xu Zhang (Hefei University of Technology, P.R. China)	943
<i>Analytical Calculation of Detent Force in Long-stator PM Linear Motor with Modified Carter Coefficients</i>	
Mingna Ma (HeFei University of Technology, P.R. China), Xu Zhang (Hefei University of Technology, P.R. China), Zhengyang Xu (Hefei University of Technology, P.R. China), Wei Tao (Hefei University of Technology, P.R. China)	947
<i>Environmental Leakage Magnetic Field Analysis of High-powered PM Linear Motor with Inverted U Structure</i>	
Mingna Ma (HeFei University of Technology, P.R. China), Zhengyang Xu (Hefei University of Technology, P.R. China), Xu Zhang (Hefei University of Technology, P.R. China), Wei Tao (Hefei University of Technology, P.R. China)	952
<i>Research on Thrust Fluctuation and Thermal Field of Tubular Permanent Magnet Linear Machine</i>	
Ying You (Harbin Institute of Technology, P.R. China), Jingang Bai (Harbin Institute of Technology, P.R. China), Jiaqi Liu (Harbin Institute of Technology, P.R. China), Shijie Yang (Harbin Institute of Technology, P.R. China), Ping Zheng (Harbin Institute of Technology, P.R. China)	956
<i>Design and Analysis of a High-Performance Dual-Stator Spoke-Type Linear Machine Using Phase-Group Concentrated-Coil Windings</i>	
Xiaodong Wang (School of Electrical Engineering, Shandong University, P.R. China), Wenliang Zhao (Shandong University, P.R. China), Xiuhe Wang (Shandong University, P.R. China), Byung-il Kwon (Hanyang University, Korea)	961

<i>Analysis and Optimization of a Tubular Permanent-Magnet Linear Generator</i>	
Bo Liu (Harbin Institute of Technology, P.R. China), Bin Yu (Beijing Institute of Aerospace Control Devices, P.R. China), Jingang Bai (Harbin Institute of Technology, P.R. China), Guopeng Liu (Harbin Institute of Technology, P.R. China), Ping Zheng (Harbin Institute of Technology, P.R. China), Yong Liu (Harbin Institute of Technology, P.R. China)	966
<i>Reducing the Detent Force of Permanent Magnet Linear Synchronous Motor Based on Single Auxiliary Pole</i>	
YuSheng Hu (State Key Laboratory of Air-conditioning Equipment and System Energy Conservation, P.R. China), Chengbao Zhong (State Key Laboratory of Air-conditioning Equipment and System Energy Conservation, P.R. China), Fang Xie (GREE Electric Appliances Inc. of Zhuhai, P.R. China), Lei Jiao (GREE Electric Appliances Inc. of Zhuhai, P.R. China), Lizhang Zheng (GREE Electric Appliances Inc. of Zhuhai, P.R. China)	970

## SS: Sensorless Control for AC Motor Drives (TD)

<i>A Smooth Switchover Method for Hybrid Sensorless Control of IPMSM</i>	
Shuying Yang (Hefei University of Technology, P.R. China), Shanhong Liu (Hefei University of Technology, P.R. China), Zhen Xie (Hefei University of Technology, P.R. China), Haoyuan Li (Hefei University of Technology, P.R. China), Xing Zhang (Hefei University of Technology, P.R. China)	976
<i>A new demodulation strategy for rotating HF signal injection based IPMSM position observer</i>	
Shuying Yang (Hefei University of Technology, P.R. China), Shanhong Liu (Hefei University of Technology, P.R. China), Haoyuan Li (Hefei University of Technology, P.R. China), Shiyuan Liu (Hefei University of Technology, P.R. China), Yanliang Ma (Hefei University of Technology, P.R. China)	982
<i>The Analysis of Initial Alignment Process in Position Sensorless Doubly Salient Electromagnetic Machine System</i>	
Xingwei Zhou (Hohai University, P.R. China), Bo Zhou (Nanjing University of Aeronautics and Astronautics, P.R. China), Feng Wu (Hohai University, P.R. China), Li Zhang (Hohai University, P.R. China), Kaimiao Wang (Nanjing University of Aeronautics and Astronautics, P.R. China)	987
<i>An Optimized Start-up Switching Strategy of Sensorless Control of PMSM</i>	
Bingjun Li (Harbin Institute of Technology, P.R. China), Yongxiang Xu (Harbin Institute of Technology (HIT), P.R. China), Lin Ji (Harbin Institute of Technology, P.R. China), Jibin Zou (Harbin Institute of Technology, P.R. China)	992
<i>Hybrid Sensorless Control Based on IF and Sliding Mode Observer Using Current Nonlinear Regulation for PMSM Drives</i>	
Haoyuan Li (Hefei University of Technology, P.R. China), Xing Zhang (Hefei University of Technology, P.R. China), Shanhong Liu (Hefei University of Technology, P.R. China), Chengjun Xu (Hefei University of Technology, P.R. China)	997
<i>A Study of RLS Adaptive Filter Algorithm in Current Loop Noise Suppression of PMSM Vector Control System</i>	
Ping Sun (Qingdao University, P.R. China), Xinzhen Wu (Qingdao University, P.R. China), Ronggang Ni (Qingdao University, P.R. China), Shuxin Nie (Qingdao University, P.R. China)	1002
<i>Position Sensorless Control of Hybrid Excitation Axial Field Flux-Switching Permanent Magnet Machine Based on Model Reference Adaptive System</i>	
Zexian Yang (Nantong University, P.R. China), Wei Zhang (Nantong University, P.R. China), Xingyan Liang (Nantong University, P.R. China), Jiale Wang (Nantong University, P.R. China), Liangguan Zhai (Nantong University, P.R. China), Yufei Zhu (Nantong University, P.R. China)	1006
<i>Barrier-Lyapunov-Function-Based Backstepping Control for PMSM Servo System with Full State Constraints</i>	
Zhonggang Yin (Xi'an University of Technology, P.R. China), Lintao Li (Xi'an University of Technology, P.R. China), Chao Du (Xi'an University of Technology, P.R. China), Yanqing Zhang (Xi'an University of Technology, P.R. China)	1011
<i>Observability Analysis of Q-MRAS Drive of Induction Motor With and Without Virtual Voltage Injection</i>	
Zhenyu Wang (Huazhong University of Science and Technology, P.R. China), Sun Wei (Huazhong University of Science and Technology, P.R. China), Dong Jiang (Huazhong University of Science and Technology, P.R. China), Ronghai Qu (Huazhong University of Science and Technology, P.R. China)	1016
<i>Speed Compensation for Sensorless Induction Motor Based on AFO With Virtual Voltage Injection In Low Speed</i>	
Zhi peng Peng (Huazhong University of Science and Technology & CAEMD, P.R. China), Wei Sun (Huazhong University of Science and Technology, P.R. China), Dong Jiang (Huazhong University of Science and Technology, P.R. China), Ronghai Qu (Huazhong University of Science and Technology, P.R. China)	1022

## SS: WBG Semiconductor Power Devices and its Applications (UA)

<i>Design and Parasitic Parameters Analysis of A LCC Resonant Inverter Using SiC MOSFET</i>	
Guoming Chuai (Harbin Institute of Technology, P.R. China), Jinxin Wang (Harbin Institute of Technology, P.R. China), Xue Yuan (Harbin Institute of Technology, P.R. China), Boxuan Lai (Harbin Institute of Technology, P.R. China), Qianfan Zhang (Harbin Institute of Technology (HIT), P.R. China)	1027

<i>A Prospect of Hybrid Planar Power Module</i>	
Yuan Tianshu (University of Chinese Academy of Sciences, P.R. China), Puqi Ning (Institute of Electrical Engineering Chinese Academy of Sciences, P.R. China), Hui Xu Wen (Institute of Electrical Engineering Chinese Academy of Sciences & Key Laboratory of Power Electronics and Electric Drive, P.R. China), Han Cao (University of Chinese Academy of Sciences, P.R. China) .....	1033
<i>A High Frequency Low Profile OLED Driver Based on GaN HEMTs</i>	
Yueshi Guan (Harbin Institute of Technology, P.R. China), Chang Liu (Harbin Institute of Technology, P.R. China), Shanshan Gao (Harbin Institute of Technology, P.R. China), Yousu Yao (Harbin Institute of Technology, P.R. China), Yijie Wang (Harbin Institute of Technology, P.R. China), Wei Wang (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China) .....	1038
<i>Efficiency Evaluation of Si-based and GaN-based Interleaved Buck/Boost Converters for Energy Storage Systems</i>	
Hongsheng Chong (Tsinghua University, P.R. China), Huan Chen (Tsinghua University, P.R. China), Kai Sun (Tsinghua University, P.R. China), Jin Lin (Tsinghua University, P.R. China), Shujun Mu (Tsinghua University, P.R. China), You Zhou (Tsinghua University, P.R. China) .....	1043
<i>System Design of Dual Active Bridge (DAB) Converter Based on GaN HEMT Device</i>	
Minglin Zhu (State Grid Shanghai, P.R. China), Chi Shao (Hangzhou Dianzi University, P.R. China), Shitao Wang (State Grid of China Technology College, P.R. China), Lijun Hang (Hangzhou Dianzi University, P.R. China), Yuanbin He (Hangzhou Dianzi University, P.R. China), Songli Fan (State Grid Shanghai, P.R. China) .....	1048

## SS: Wireless Power Transfer (UA)

<i>Review and Research Status of Dynamic Bidirectional-Energy-Interaction-Based Wireless Power Transfer technology</i>	
Xuan Zhao (Lanzhou Jiaotong University, P.R. China), Ruoqiong Li (Lanzhou Jiaotong University, P.R. China), Xin Li (Lanzhou Jiaotong University, P.R. China) .....	1054
<i>A Novel Switching Control Method for Segmented Dynamic Wireless Power Supply of Electric Vehicles</i>	
De'an Wang (Harbin Institute of Technology, P.R. China), Chunbo Zhu (Harbin Institute of Technology, P.R. China), Rengui Lu (Harbin Institute of Technology, P.R. China), Kai Song (Harbin Institute of Technology, P.R. China), Shuai Dong (Harbin Institute of Technology, P.R. China), Guo Wei (Harbin Institute of Technology, P.R. China) .....	1060
<i>A Novel Wireless Power Transfer System with Two Transmitting Coils for Three Resonant Frequencies and Four Receivers</i>	
Yang Xiao (City University of Hong Kong, Hong Kong), Chunhua Liu (City University of Hong Kong, Hong Kong), Yongcan Huang (School of Energy and Environment, City University of Hong Kong, Hong Kong) .....	1066
<i>A Novel Current and Power Equalization Method of Parallel Pick-up Modules in ICPT System</i>	
Xuerui Sheng (Key Laboratory of Power Electronics and Electric Drive, Institute of Electrical Engineering & University of Chinese Academy of Sciences, P.R. China), Liming Shi (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Lu Zhao (Chinese Academy of Sciences, unknown) .....	1070
<i>A New Type of Curved Coupling Coil for Wireless Power Transmission</i>	
Rui Hou (Harbin Institute of Technology at Weihai, P.R. China), Yuan Zhou (Harbin Institute of Technology at Weihai, P.R. China), Jian Wu (Harbin Institute of Technology, P.R. China), Huihui Song (Harbin Institute of Technology at Weihai, P.R. China), Yanbin Qu (Harbin Institute of Technology at Weihai, P.R. China) .....	1075
<i>Research and Application of Dual-Load wireless power Transmission System</i>	
Rui Hou (Harbin Institute of Technology at Weihai, P.R. China), Xuning Wang (Harbin Institute of Technology at Weihai, P.R. China), Jian Wu (Harbin Institute of Technology, P.R. China), Huihui Song (Harbin Institute of Technology at Weihai, P.R. China), Yanbin Qu (Harbin Institute of Technology at Weihai, P.R. China) .....	1079
<i>Suppression of Resonant Frequency Drifting of Transmitter for One-to-Multiple Wireless Power Transfer System by Utilizing Hybrid Compensation Topologies in Receivers</i>	
Yongcan Huang (City University of Hong Kong, SEE and SRI, Hong Kong, Hong Kong), Chunhua Liu (City University of Hong Kong, SEE and SRI, Hong Kong, Hong Kong), Yang Xiao (City University of Hong Kong, SEE and SRI, Hong Kong, Hong Kong), Senyi Liu (City University of Hong Kong, SEE and SRI, Hong Kong, Hong Kong), Zaixin Song (City University of Hong Kong, SEE and SRI, Hong Kong, Hong Kong) .....	1084
<i>Design and Optimization for Circular Planar Spiral Coils in Wireless Power Transfer System</i>	
Yao Wang (Northwestern Polytechnical University, P.R. China), Weiguo Liu (Northwestern Polytechnic University, P.R. China), Yufeng Xie (Northwestern Polytechnical University, P.R. China) .....	1089
<i>Study on Two-phase Interleaved ZCT-PWM Buck Converter for Wireless Charging System</i>	
Chengxuan Tao (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Lifang Wang (IEE of CAS, P.R. China), Zhimeng Liu (University of Chinese Academy of Sciences, P.R. China), Qiang Bo (University of Chinese Academy of Sciences, P.R. China) .....	1093

# SS: Wireless Power Transfer (UB)

<i>Thermal Simulation and Optimization Study for Magnetic Coupler of Static Electric Vehicle Wireless Power Transfer Systems</i>	
Chunbo Zhu (Harbin Institute of Technology, P.R. China), Chaoye Fu (Harbin Institute of Technology, P.R. China), De'an Wang (Harbin Institute of Technology, P.R. China), Xiaohua Huang (China Electric Power Research Institute, P.R. China), Hailong Zhang (State Grid Hebei Electric Power Supply Co., Ltd, P.R. China), Shuai Dong (Harbin Institute of Technology, P.R. China), Guo Wei (Harbin Institute of Technology, P.R. China), Kai Song (Harbin Institute of Technology, P.R. China)	1097
<i>Optimization of Asymmetrical Coil Structures for Magnetic Coupled Wireless Power Transfer Systems</i>	
Feng Wen (Nanjing University of Science and Technology & Jiangsu Provincial Key Laboratory of Smart Grid Technology and Equipment, P.R. China), Rui Li (Nanjing University of Science and Technology, P.R. China), Qiang Li (Nanjing University of Science and Technology, P.R. China), Li Liu (Nanjing University of Science and Technology, P.R. China), Yuxiao Li (Nanjing University of Science and Technology, P.R. China)	1101
<i>Magnetizer Optimization of DD Type Coils for EV Wireless Charging System</i>	
Xiangxiu Chen (Jiangnan University, P.R. China), Wenzhou Lu (Jiangnan University, P.R. China), Yifan Dong (Jiangnan University, P.R. China), Hongjie Jiang (Jiangnan University, P.R. China)	1106
<i>A Novel Dual-transmitted Wireless Power Transfer with High Lateral Misalignment Tolerance</i>	
Yufeng Xie (Northwestern Polytechnical University, P.R. China), Jun Ding (Northwestern Polytechnical University, P.R. China), Yao Wang (Northwestern Polytechnical University, P.R. China), Lin Song (Northwestern Polytechnical University, P.R. China)	1110
<i>Basic Principles of Point-to-Point Omni-directional Wireless Power Transfer System</i>	
Pengzhi Yao (Chongqing University, P.R. China), Jing Zhou (Zhejiang University, P.R. China), Li Han (Chongqing University, P.R. China), Kan Guo (Zhejiang University, P.R. China)	1115
<i>Design Considerations for a Position-Adaptive Contactless Underwater Power Deliver System</i>	
Kan Guo (Zhejiang University, P.R. China), Jing Zhou (Zhejiang University, P.R. China), Hui Sun (Zhejiang University, P.R. China), Pengzhi Yao (Chongqing University, P.R. China)	1120
<i>Bidirectional Communication in the Inductive WPT System with Injected Information Transmission</i>	
Zhifeng Dou (Zhengzhou University of Light Industry, P.R. China), Shuaibiao He (Zhengzhou University of Light Industry, P.R. China), Jie Wu (Zhengzhou University of Light Industry, P.R. China), Nan Jin (Zhengzhou University of Light Industry, P.R. China), Yuegong Li (Zhengzhou University of Light Industry, P.R. China), Dianguang Ma (Shanghai Jiao Tong University, P.R. China)	1126
<i>Wireless Power and Information Transfer System with Full Bridges Based on Multi-frequency Programmed PWM</i>	
Jie Wu (Zhengzhou University of Light Industry, P.R. China), Yuegong Li (Zhengzhou University of Light Industry, P.R. China), Nan Jin (Zhengzhou University of Light Industry, P.R. China), Wei Deng (Zhengzhou University of Light Industry, P.R. China), Lizhong Bie (Zhengzhou University of Light Industry, P.R. China), Shuaibiao He (Zhengzhou University of Light Industry, P.R. China), Hengyi Zhang (Zhengzhou University of Light Industry, P.R. China), Zhiwei Zhang (The Ohio State University, USA)	1131
<i>A Novel Wireless Energy Transmission System with Multiple Resonant Coils</i>	
Jie Wu (Zhengzhou University of Light Industry, P.R. China), Yuegong Li (Zhengzhou University of Light Industry, P.R. China), Zhifeng Dou (Zhengzhou University of Light Industry, P.R. China), Nan Jin (Zhengzhou University of Light Industry, P.R. China), Wei Deng (Zhengzhou University of Light Industry, P.R. China), Lizhong Bie (Zhengzhou University of Light Industry, P.R. China), Hengyi Zhang (Zhengzhou University of Light Industry, P.R. China)	1136
<i>Research on wireless power Transfer System of Automated Guided Vehicle Based on Magnetic Coupling Resonance</i>	
Yanbiao Hao (Beijing Jiaotong University, P.R. China), Wang Jianqiang (Beijing Jiaotong University, P.R. China), Yue Liu (Beijing Jiaotong University, P.R. China)	1140
<i>Derivation Method for Reliable Initial Design in Design Optimization Using Dot Sensitivity</i>	
Seung Geon Hong (Sungkyunkwan University, Korea), Jun Seong Lee (Sungkyunkwan University, Korea), Jun Hyeong Wang (Sungkyunkwan University, Korea), IL Han Park (Sungkyunkwan University, Korea)	1144
<i>A FDM-based Simultaneous Wireless Power and Data Transfer (SWPDT) System Functioning with High-rate Full-duplex Communication</i>	
Haisong Cheng (Harbin Institute of Technology, P.R. China), Yijie Wang (Harbin Institute of Technology, P.R. China), Longlong Zhang (Shandong Institute of Space Electronic Technology, P.R. China), Lei Wang (Shandong Institute of Space Electronic Technology, P.R. China), Yousu Yao (Harbin Institute of Technology, P.R. China), Mai Jianwei (Harbin Institute of Technology, P.R. China), Kaixing Lu (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China)	1148
<i>The state of Human Bodies in the electromagnetic field based on wireless power transfer technology</i>	
Jiantao Zhang (Harbin Institute of Technology, P.R. China), Ying Liu (Harbin Institute of Technology, P.R. China)	1153
<i>Research on the transmission characteristics of various coupling structures based on Various Wireless Power Transfer Technology</i>	
Jiantao Zhang (Harbin Institute of Technology, P.R. China), Ying Liu (Harbin Institute of Technology, P.R. China)	1158

# Magnetics and Field Analysis (JA)

<i>Measurement of eddy current loss in permanent magnets with high-frequency effects of electrical machines for hazardous locations</i>	
Nijan Yogal (Physikalisch-Technischen Bundesanstalt (PTB), Germany), Christian Lehrmann (Physikalisch-Technische Bundesanstalt, Germany), Markus Henke (TU Braunschweig, Germany) .....	1164
<i>Flux linkage and Inductance Analysis of Long-Stroke TPMSLM</i>	
Chunlei Zhang (Tsinghua University, P.R. China), Peiqing Ye (Tsinghua University, P.R. China), Hui Zhang (Tsinghua Uni, P.R. China) .....	1169
<i>A nonlinear electromagnetic-mechanical-thermal multi-field coupled model for Galfenol rods</i>	
Yafang Li (State Key Laboratory of Reliability and Intelligence of Electrical Equipment, P.R. China) .....	1174
<i>Thermal Network Modeling of a Novel Hybrid Axial Field Flux-Switching Permanent Magnet Machine</i>	
Yixiang Tu (Nanjing University of Science and Technology, P.R. China), Da Xu (Nanjing University of Science and Technology, unknown), Qiang Li (Nanjing University of Science and Technology, P.R. China) .....	1178
<i>Hysteretic and Loss Modeling of Silicon Steel Sheet under the DC Biased Magnetization Based on the Preisach Model</i>	
Xiaojun Zhao (North China Electric Power University, P.R. China), Xiaona Liu (Yonghuabei Street, Baoding City, Hebei Province & North China Electric Power University, P.R. China), Lin Li (North China Electric Power University, P.R. China) .....	1184
<i>Analysis of static magnetic flux density and electromagnetic force distribution of a dry-type air-core reactor under different operating current</i>	
Fanwu Chu (China Electric Power Research Institute & China, P.R. China), Ying Fu (State Grid Corporation of China, P.R. China), Qi Wang (China Electric Power Research Institute, P.R. China), Xiong Wu (China Electric Power Research Institute, P.R. China), Zongxi Liu (China Electric Power Research Institute, P.R. China), Xiaoyan Lei (China Electric Power Research Institute, P.R. China) .....	1190
<i>Study on magnetic field distribution of 10 kV switchgear and shielding efficiency of enclosure</i>	
Bo Liu (NARI GROUP Liability Corporation, P.R. China), Ziqing Ouyang (State Grid Wuhan Electric Power Supply Company, P.R. China), Peng Li (China Three Gorges University, P.R. China), Yingying Qu (China Three Gorges University, P.R. China), Tian Wu (China Three Gorges University, P.R. China), Zhen Wei (NARI GROUP Liability Corporation, P.R. China) .....	1194
<i>Analysis of Thermal Performance in FSPM Motor Considering Multi-driving Mode</i>	
Wenru Chen (Jiangsu University, P.R. China), Lei Xu (Jiangsu University, P.R. China), Zixuan Xiang (Jiangsu University, P.R. China), Min Jianq (Jiangsu University, P.R. China), Weiling Pu (Jiangsu University, P.R. China), Xiaoyong Zhu (Jiangsu University & School of Electrical and Information Engineering, P.R. China) .....	1199
<i>A Novel Two Degrees-of-Freedom Rotary-linear Flux-Switching Permanent Magnet Machine</i>	
Peixin Wang (Southeast University, P.R. China), Wei Hua (Southeast University, P.R. China), Wenfei Yu (Southeast University, P.R. China), Chenxin Tang (Southeast University, P.R. China), Zhang Gan (Southeast University, P.R. China), Ruiwu Cao (Nanjing University of Aeronautics and Astronautics & College of Automation Engineering, P.R. China) .....	1204
<i>The Analysis and Calculation of Load Radial Electromagnetic Force of the Interior Permanent Magnet Synchronous Machine</i>	
Zhang Xin (Shandong University, P.R. China), Xiuhe Wang (Shandong University, P.R. China), Wenliang Zhao (Shandong University, P.R. China), Xiaopan Liu (ShanDong University, P.R. China), Zhaofeng Zhang (State Grid Taian power Supply Company, P.R. China) .....	1209
<i>Measurement and Modelling of the Rotational Core Losses in an Induction Machine at Different Load Conditions</i>	
Yongjian Li (Hebei University of Technology, P.R. China), Xinghan Li (Hebei University of Technology, P.R. China), Changgeng Zhang (Hebei University of Technology, P.R. China), Zhiwei Zhang (The Ohio State University, USA), Qingxin Yang (Tianjin University of Technology, P.R. China) .....	1214
<i>Modeling and Measurement of Air Gap Magnetic Characteristics of Anode Saturable Reactors under Impulse Current Excitation</i>	
Jiajun Wang (Hebei University of Technology, P.R. China), Changgeng Zhang (Hebei University of Technology, P.R. China), Yongjian Li (Hebei University of Technology, P.R. China), Qingxin Yang (Tianjin University of Technology, P.R. China) .....	1219
<i>Multiphysics Analysis of the Busbar in MMC Submodule Under DC Pole-to-Pole Fault</i>	
Chen Yang (South China University of Technology, P.R. China), Fan Xie (South China University of Technology, P.R. China), Bo Zhang (South China University of Technology, P.R. China), Dong Yuan Qiu (South China University of Technology, P.R. China), Yanfeng Chen (South China University of Technology, P.R. China) .....	1224
<i>Magneto-Mechanical Coupling Analysis of Asynchronous Motor Considering Stator Vibration</i>	
Chenguang Feng (College of Electrical Engineering & Zhejiang University, P.R. China), Changsheng Zhu (Zhejiang University, P.R. China) .....	1230

*Harmonic Analysis of Linear-Rotor Axial Reluctance Resolver*

Jing Shang (Harbin Institute of Technology, P.R. China), Xiaohe Ran (Harbin Institute of Technology, P.R. China),  
Meng Zhao (Harbin Institute of Technology, P.R. China) ..... 1235

## Permanent Magnet Generator Systems (KA)

*Subsynchronous Interaction Analysis of PMSG Based Wind Farm With AC Networks*

Guoqing Tao (Shenzhen University & College of Mechanical and Control Engineering, P.R. China) ..... 1241

*A New Control Method for Microturbine-generation based Series Hybrid Power System*

Jialin Wei (Institute of Electrical Engineering of CAS & University of Chinese Academy of Sciences, P.R. China),  
Youlong Wang (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Hui Xu Wen (Institute  
of Electrical Engineering Chinese Academy of Sciences & Key Laboratory of Power Electronics and Electric Drive,  
P.R. China), Hongyang Li (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Ying Zhang  
(Institute of Electrical Engineering of CAS&University of Chinese Academy of Sciences, P.R. China), Ke Li (University  
of Chinese Academy of Sciences, unknown) ..... 1246

*Supply Voltage Regulation for PMSM-Based ISG System with a Shunt Voltage Source Inverter*

Yuanhao Xie (Huazhong University of Science and Technology, P.R. China), Lei Zhu (Huazhong University of Science  
and Technology, P.R. China), Dong Jiang (Huazhong University of Science and Technology, P.R. China), Shichao Liu  
(Shanghai Institute of Space Power-Sources, P.R. China), Yang Li (Shanghai Institute of Space Power-Sources, P.R.  
China) ..... 1251

*Design of Magnetic Gear Integrated Generator with Mixed Magnetization and Eccentric Pole Method for Wave Energy  
Conversion*

Hongwei Fang (Tianjin University, P.R. China), Yu Wang (Tianjin University, P.R. China), Xiaoshi Cai (Beijing Institute  
of Aerospace Control Instruments, P.R. China) ..... 1255

*Study on Performance of Permanent Magnet Synchronous Generator Based on Winding Structure*

Guohui Li (University of Chinese Academy of Sciences, P.R. China), Xiong Bin (Chinese Academy of Sciences,  
unknown), Yun Feng (University of Chinese Academy of Sciences, P.R. China), Hualin Shi (Institute of Electrical  
Engineering, Chinese Academy of Sciences, P.R. China) ..... 1261

*Design of Superconducting Synchronous Generator for Wave Power Generation*

Hongwei Fang (Tianjin University, P.R. China), Jiabao Zhang (School of Electrical and Information Engineering  
Tianjin University, P.R. China), Xiangdong Huang (Tianjin University, P.R. China), Wei Gao (Jishui Power Supply  
Company State Grid Jiangxi Electric Power Company, P.R. China) ..... 1265

*Thermal Analysis of Internal Short-Circuit Faults in Stator Windings of Multiphase Permanent Magnet Synchronous  
Generator with Rectifier-load System*

Daizong Tian (Tsinghua University, P.R. China), Yuguang Sun (Tsinghua University, P.R. China), Wei Du (Tsinghua  
University, P.R. China), Lin Gui (Tsinghua University, P.R. China) ..... 1271

*Simulation Study on Permanent Magnet Doubly Fed Induction Generators under Grid Voltage Dip*

Tongshan Diao (Qilu University of Technology, P.R. China), Zhiguo Yan (Qilu University of Technology(Shandong  
Academy of Sciences), P.R. China), Lianfei Wang (Jinan Engineering Vocational Technical College, P.R. China), Jiahe  
Liu (Qilu University of Technology, P.R. China), Dongdong Hou (Qilu University of Technology(Shandong Academy  
of Sciences), P.R. China), Ningran Song (Qilu University of Technology(Shandong Academy of Sciences), P.R. China) ..... 1277

*Flux Weakening Control Technology of Multi-phase PMSG for Aeronautical High Voltage DC Power Supply System*

Yan Li (Naval Aviation University, P.R. China, P.R. China), Chengfei Dong (Naval Aviation University, P.R. China) ..... 1282

*Influence of Power Factor on High Temperature Demagnetization of High-Speed Permanent Magnet Generator*

Hongbo Qiu (Zhengzhou University of Light Industry, P.R. China), Xifang Zhao (Zhengzhou University of Light  
Industry, P.R. China), Yanqi Wei (Zhengzhou University of Light Industry, P.R. China), Ran Yi (Zhengzhou University  
of Light Industry, P.R. China), Cunxiang Yang (Zhengzhou University of Light Industry, P.R. China) ..... 1287

*Design and Research of Tubular Frequency Multiplication Permanent Magnet Linear Oscillation Generator*

Bing Peng (Shenyang University of Technology, P.R. China), Rao Dou (Shenyang University of Technology, P.R.  
China), Shi Jin (Shenyang University of Technology, P.R. China) ..... 1293

*The current close-loop charging control strategy with input feed-forward compensation for lithium-ion batteries*

Peng Meng (Chinese Academy of Sciences & Institute of Electrical Engineering, P.R. China) ..... 1298

*Research on Starting/Generating System Based on Permanent Magnet Machine for Vehicle Application*

Zhangyang Sun (Nanjing University of Science and Technology, P.R. China), Yin Dejun (Nanjing University of  
Science and Technology, P.R. China) ..... 1302

<i>Performance Analysis on a Surface-mounted Permanent Magnet Synchronous Generator with Hybrid Excitation based on Equivalent Magnetic Circuit</i>	
Changqing Zhu (Shandong University, P.R. China), Xiuhe Wang (Shandong University, P.R. China), Wenliang Zhao (Shandong University, P.R. China), Yubo Yang (Shandong University, P.R. China), Peijing Yu (Shandong University, P.R. China)	1306
<i>Control Strategy for Islanding Generation of Micro Gas Turbine System</i>	
Limin Wang (ENN Energy Power Technology (Shanghai) Co. Ltd, P.R. China), Qilei Bao (ENN Energy Power Technology (Shanghai) Co. Ltd, P.R. China), Mingji Liu (North China Electric Power University, P.R. China)	1311

## Motion Control and Servo Systems (LA)

<i>Neural Networked PID Hydraulic Servo Controlling with the Algorithm of Recursive LM</i>	
Xin Chen (Wuhan Business University, P.R. China)	1315
<i>Modelling and robust <math>H_{\infty}</math> control of teleoperation system with partitioned time-varying delay</i>	
Xin Chen (Wuhan Business University, P.R. China)	1320
<i>A Study on Brake Control Strategy for the UAV All-Electric Brake System</i>	
Yiyun Zhao (Northwestern Polytechnical University, P.R. China), Hui Lin (Northwestern Polytechnical University, P.R. China)	1325
<i>Adaptive Robust Motion Control of an Ironless Permanent Magnet Linear Synchronous Motor with Dead-zone Compensation</i>	
Peng Sun (Hefei Institutes of Physical Science, CAS, P.R. China)	1330
<i>Following Response Analysis of Adhesion Control for Electric Vehicle Based on Regulator Engineering Design</i>	
Ying Yang (Shanghai University, P.R. China), Jindao Zhang (Shanghai University, P.R. China), Yuanyuan Luo (Shanghai University, P.R. China), Guoqing Xu (Shenzhen Institute of Advanced Technology Chinese Academy of Science, P.R. China), Fei Wang (Shanghai University, P.R. China)	1335
<i>Contour Control of H-type Platform Based on Complementary Sliding Mode Cross-coupling Control</i>	
Su Puchun (Shenyang University of Technology, P.R. China), Wang Limei (Shenyang, P.R. China)	1340
<i>Switching Control with Time Optimal Sliding Mode Control Strategy for Electric Load Simulator with Backlash</i>	
Mingguang Dai (Northwestern Polytechnical University, P.R. China), Rong Qi (Northwestern Polytechnical University, P.R. China), Yang Li (Northwestern Polytechnical University, P.R. China)	1346
<i>Sliding Mode Control Method of Photoelectric Turntable Based on LuGre Friction Model</i>	
Ning Hao Cui (Anhui University, P.R. China), Qian Zhang (National Engineering Laboratory of Energy-Saving Motor & Control Technology, P.R. China), Qunjing Wang (Anhui University, P.R. China), Zhenglei Ma (Shanghai Yingjue Technology Co., Ltd., P.R. China), Jianjun Chen (Nanjing EXSCIN Information, P.R. China), Deyin Lin (Shanghai Yingjue Technology Co., Ltd., P.R. China)	1352
<i>Torque Ripple Suppression in Flux Switching Permanent Magnet Machines Using Disturbance Observer</i>	
Jiawei Zhou (Southeast University, P.R. China), Ming Cheng (Southeast University, P.R. China)	1356
<i>Design of Low Speed Controller for Traveling Wave Ultrasonic Motor</i>	
Jingwen Leng (Southeast University, P.R. China), Peng Pan (Southeast University, unknown), Zhike Xu (Southeast University, P.R. China), Tao Wang (Southeast University, P.R. China), Long Jin (Southeast University, P.R. China)	1361
<i>Time-Delay Compensation Method for Predictive Current Control in PMSM Servo Systems with Sensitivity Analysis</i>	
Jingzhe Gao (Harbin Institute of Technology, P.R. China), Shaobin Li (Harbin Institute of Technology, P.R. China), Yongxiang Xu (Harbin Institute of Technology (HIT), P.R. China), Jibin Zou (Harbin Institute of Technology, P.R. China)	1366
<i>Research on Coordinated Control of Multi-PMSLM Based on Sliding Mode Variable Structure Deviation Coupling Algorithm</i>	
Pengfei Fu (Shenzhen University, P.R. China), Jianfei Pan (Shenzhen University, P.R. China), Can Wang (Shenzhen University, P.R. China), Ren Huang (Shenzhen University, P.R. China)	1372
<i>A Simple Inverter Nonlinearity Compensation Method Using On-Line Voltage Error Observer</i>	
Shanfeng Zhu (Nanjing University of Aeronautics and Astronautics, P.R. China), Wenxin Huang (Nanjing University of Aeronautics and Astronautics, P.R. China), Yong Yan (Nanjing University of Aeronautics and Astronautics, P.R. China)	1377
<i>Adaptive Robust Position Control of Uncertain PMSM Servo System Using Extended State Observer</i>	
Li Fangjun (Beijing Mechanical Equipment Institute, Beijing, P.R. China)	1383
<i>Vibration Suppression in Position Servo Systems via Active Disturbance Rejection Control</i>	
Chunli Wang (Harbin Institute of Technology, P.R. China), Jiayi Liu (Harbin Institute of Technology (HIT), P.R. China), Le Pei (Harbin Institute of Technology, P.R. China), Liyi Li (Harbin Institute of Technology, P.R. China), Qingbo Guo (Harbin Institute of Technology, P.R. China), Fenghua Peng (State Grid Hunan Electric Power Company, P.R. China)	1387

<i>Explicit Model Predictive Control of Permanent Magnet Synchronous Motor with Kalman Filter</i>	
Mengle Wang (Harbin Institute of Technology, P.R. China), Jianyong Su (Harbin Institute of Technology (HIT), P.R. China), Ke Zhao (Harbin Institute of Technology (HIT), P.R. China)	1392
<i>Sinusoidal Commutation of a Micro Coreless BLDC Motor with Delta-Sigma ADC Current Sensing</i>	
Chengde Tong (Harbin Institute of Technology, P.R. China), Jiwen Lang (Harbin Institute of Technology, P.R. China), Guangyuan Qiao (Harbin Institute of Technology, P.R. China), Mingqiao Wang (Harbin Institute of Technology, P.R. China), Zuosheng Yin (Harbin Institute of Technology, P.R. China), Ping Zheng (Harbin Institute of Technology, P.R. China)	1398
<i>Research on Setting Method of Control Parameters for Excitation system on New-generation Synchronous Condensers</i>	
Fan Xiao (Hubei Electric Power Research Institute, P.R. China), Youbin Zhou (Hubei Electric Power Research Institute, P.R. China)	1402
<i>Robust Composite Nonlinear Feedback Control of Voice Coil Motor for High Precision Point-to-Point Positioning System</i>	
Qiming Chen (Harbin Institute of Technology, P.R. China), Le Pei (Harbin Institute of Technology, P.R. China), Liyi Li (Harbin Institute of Technology (HIT), P.R. China), Pengcheng Du (Harbin Institute of Technology, P.R. China)	1407

## Sensorless Control (SA)

<i>Improved-Reduced Order Generalized Integrator Based Sliding-Mode Observer for Interior Permanent Magnet Synchronous Motor Sensorless Control</i>	
Ting Chen (Hunan University, P.R. China), Shoudao Huang (Hunan University, P.R. China), Xuan WU (Hunan University, P.R. China), Ting Wu (Hunan University, P.R. China)	1412
<i>EEMF-based Sensorless control for IPMSM Drives with an Optimized Asymmetric Space Vector Modulation</i>	
Zhe Chen (Northwestern Polytechnical University, P.R. China), Hang Zhang (Shaanxi Key Laboratory of Small & Special Electrical Machine and Drive Technology, P.R. China), Zhenbin Zhang (School of Electrical Engineering Shandong University, P.R. China)	1418
<i>Comparison Between High Frequency Sinusoidal Pulsating Voltage and Minimum-Voltage Vector Injection for Sensorless Control of PMSM Drives</i>	
Hui Wang (Hunan University, P.R. China), Guofa Deng (Hunan University, P.R. China), Xuan WU (Hunan University, P.R. China), Shoudao Huang (Hunan University, P.R. China)	1423
<i>Speed Sensorless Control in Direct-drive Permanent Magnet Synchronous Generator System</i>	
Bo Xia (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Jian Zhang (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Peng Meng (Chinese Academy of Sciences & Institute of Electrical Engineering, P.R. China), Li Wenshan (Institute of Electrical Engineering, P.R. China), Hui Xu Wen (Institute of Electrical Engineering Chinese Academy of Sciences & Key Laboratory of Power Electronics and Electric Drive, P.R. China)	1429
<i>Hybrid Sensorless Full Speed Range Control for Six-phase PMSM</i>	
Guohong Zeng (Beijing Jiaotong University, P.R. China), Yukun Dong (Beijing Jiaotong University, P.R. China)	1434
<i>An Improved Sensorless Control Method for Long Stator Linear Synchronous Motor</i>	
Pengkun Sun (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Qiongquan Ge (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Zhang Bo (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Zhan Gao (Key Laboratory of Power Electronics and Electric Drive, Institute of Electrical Engineering & University of Chinese Academy of Sciences, P.R. China)	1440
<i>Comparison of MRAS and SMO method for sensorless PMSM drives</i>	
Li Wenshan (Institute of Electrical Engineering, P.R. China)	1444
<i>Sensorless Control Based on Slide Mode Observer for Stirling Linear Generator</i>	
Hailin Zhang (Chongqing University, P.R. China), Baoquan Kou (School of Electrical Engineering and Automation, Harbin Institute of Technology, P.R. China), Jun Yao (Chongqing University, P.R. China)	1448
<i>A Novel Initial Rotor Position Estimation Strategy for Doubly Salient Electromagnetic Machine with Two Test Pulses Injection</i>	
Xingwei Zhou (Hohai University, P.R. China), Kaimiao Wang (Nanjing University of Aeronautics and Astronautics, P.R. China), Li Zhang (Hohai University, P.R. China)	1452
<i>Position Sensorless Control of IPMSM Based on Quasi-Newton Methods</i>	
Zhiyu Wang (Southeast University, P.R. China), Bingruo Xie (State Key Laboratory for Traction and Control System of EMU and Locomotive, P.R. China), Lidong Bu (State Key Laboratory for Traction and Control System of EMU and Locomotive, P.R. China), Weizhi Liu (State Key Laboratory for Traction and Control System of EMU and Locomotive, P.R. China), Fei Peng (Southeast University, P.R. China), Yunkai Huang (Southeast University, P.R. China)	1457
<i>Interpolated Position Control for Permanent Magnet Synchronous Machines at Low Speed Region</i>	
Kan Liu (Hunan University, P.R. China), Yanwei Liang (Hunan University, P.R. China), Weibin Wang (Hunan University, P.R. China)	1463



<i>Low-speed Sensorless MTPA Control of Interior Permanent Magnet Synchronous Motor Based on Parameter Self-learning</i>	
Keyuan Huang (Hunan University, P.R. China), Jiaxin Zhou (Hunan University, P.R. China), Shoudao Huang (Hunan University, P.R. China), Mingbao Shen (Hunan University, P.R. China), Zhang Duanni (Hunan University, P.R. China), Luhan Chen (Changsha, Hunan, P.R. China)	1469
<i>Speed Sensorless Control of Axial Field Flux-Switching Permanent Magnet Machine Based on Improved Adaptive Sliding Mode Observer</i>	
Liangguan Zhai (Nantong University, P.R. China), Wei Zhang (Nantong University, P.R. China), Xingyan Liang (Nantong University, P.R. China), Zexian Yang (Nantong University, P.R. China), Jiale Wang (Nantong University, P.R. China), Yufei Zhu (Nantong University, P.R. China)	1475
<i>Position Estimation Method Based on Frequency Self-optimization High-Frequency Signal Injection</i>	
Xu Tongxing (Nanjing University Of Aeronautics And Astronautics, P.R. China)	1480
<i>A Rotor Position Detection Method at High Speed for Electrically Excited Synchronous Motor</i>	
Jiabao Kou (Harbin Institute of Technology, P.R. China), Qiang Gao (Harbin Institute of Technology (HIT), P.R. China), Yongxiao Teng (Harbin Institute of Technology, P.R. China), Zhinan Sha (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China)	1484
<i>A sensorless control method combined I-F startup with improved full-order sliding mode observer for flywheel energy storage system</i>	
Yang Liang (Xi'an Jiao Tong University, P.R. China), Deliang Liang (Xi'an Jiaotong University, P.R. China), Shaofeng Jia (Xi'an Jiaotong University, P.R. China), Shuaijun Chu (Xi'an Jiaotong University, P.R. China)	1489
<i>Back-EMF based Sensorless Control of PMSM with an Improved PLL for Eliminating the Position Estimation Fluctuation</i>	
Feng Jiang (Huazhong University of Science and Technology, P.R. China), Kai Yang (Huazhong University of Science and Technology, P.R. China), Songjun Sun (Huazhong University of Science and Technology, P.R. China), Yunliu Xu (Huazhong University of Science and Technology, P.R. China), Anming Liu (Huazhong University of Science and Technology, P.R. China, unknown)	1494
<i>Study of self-sensing actuation strategies for quasi-static piezoelectric actuators</i>	
Louis A. Masson (Ecole Polytechnique Federale de Lausanne, Switzerland), Yves Perriard (Laboratory director, Switzerland)	1498

## Machines System Modeling (MA)

<i>Power Hardware-in-the-loop Emulation System for Permanent Magnet Synchronous Machines</i>	
Lei Zhang (Beihang University, P.R. China), Hong Guo (Beihang University, P.R. China)	1503
<i>Effect of Magnetization Curve Model and Winding Connection Mode on Magnetically Saturated Controllable Reactor Based on ANSYS</i>	
Huiying Zhang (Lanzhou Jiaotong University, P.R. China), Mingxing Tian (Lanzhou Jiaotong University, P.R. China), Pei Jing (Lanzhou Jiaotong University, P.R. China)	1509
<i>Transient Characteristic Modeling of DFIG Considering Control Loop under Grid Voltage Fault</i>	
Xiao Jin (Zhejiang University, P.R. China), Heng Nian (Zhejiang University, P.R. China), Bo Pang (Zhejiang University & College of Electrical Engineering, P.R. China)	1514
<i>Harmonic analysis of three-phase fractional-slot concentrated windings based on number theory</i>	
Xingui Hou (Nanjing Institute of Technology, P.R. China)	1519
<i>The Implementation and Test for HIL Real-time Simulation of Doubly-fed Induction Generator Based on FPGA</i>	
Jin Gao (Shanghai University, P.R. China), Ning Wang (Shanghai University, P.R. China), Jing Wang (Shanghai University, P.R. China), Siyu Wang (Shanghai University, P.R. China), Pengfei Zhan (Shanghai University, P.R. China)	1525
<i>Modeling Method for Simulating Operation Conditions of Gas Turbine Generator Set</i>	
Yunliu Xu (Huazhong University of Science and Technology, P.R. China), Tianle Li (Huazhong University of Science and Technology, P.R. China), Songjun Sun (Huazhong University of Science and Technology, P.R. China), Kai Yang (Huazhong University of Science and Technology, P.R. China), Xing Wang (Huazhong University of Science and Technology, P.R. China)	1530
<i>Design and Comparison of Three Different Types of IE4 Efficiency Machines</i>	
Shaofeng Jia (Xi'an Jiaotong University, P.R. China), Ping Zhang (Xi'an Jiaotong University, P.R. China), Deliang Liang (Xi'an Jiaotong University, P.R. China), Maocun Dai (Yangzhou Huasheng Motors Manufacturing co., Ltd, P.R. China), Jinjun Liu (Xi'an Jiaotong University, P.R. China)	1535

<i>Accurate Modeling Method for DC Biased Vernier Reluctance Motor System Based on Finite Element Parameter Scanning</i>	
Ruiqing Gao (Huazhong University of Science and Technology, P.R. China), Zhiyue Yu (Huazhong University of Science and Technology, P.R. China), Yu Chen (Huazhong University of Science and Technology, P.R. China), Chun Gan (Huazhong University of Science and Technology, P.R. China), Ronghai Qu (Huazhong University of Science and Technology, P.R. China)	1539
<i>Real-time Simulation Analysis of the Impacts of New-generation Synchronous Condensers on AC/DC Parallel System</i>	
Fan Xiao (Hubei Electric Power Research Institute, P.R. China), Youbin Zhou (Hubei Electric Power Research Institute, P.R. China)	1546
<i>Transient Characteristic Analysis of Induction Motor at Bus Transfer by Power Failure</i>	
Jong-gyeum Kim (Gangneungwonju University, Korea), Cherl-Jin Kim (Korea Polytechnic University, Korea), Il-Jung Kim (Hoseo University, Korea), Heung-Kyo Shin (Gyeongsang National University, unknown)	1552

## Renewable Energy Systems (NA)

<i>Compound Current Control of the H6 Topology Single-phase Grid-connected</i>	
Yanping Wu (ShenZhen University & College of Mechanical and Control Engineering, P.R. China)	1556
<i>Seamless Transfer Scheme Based on Unified Control Structure for Single-Stage Photovoltaic Inverter</i>	
Minsheng Zhou (Electrical Engineering & Harbin Institute of Technology, P.R. China), Hongpeng Liu (Harbin Institute of Technology, P.R. China), Wang Wei (Harbin Institute of Technology, P.R. China), Frede Blaabjerg (Aalborg University, Denmark)	1560
<i>Model Predictive Control in Power Grid Simulator for Impedance Measurement</i>	
Meng Li (Zhejiang University, P.R. China)	1565
<i>Review of Research on Power Accommodation of Power Systems with High Proportion Renewable Power Sources</i>	
Yue Chen (Harbin Institute of Technology, P.R. China), Zhizhong Guo (Harbin Institute of Technology, P.R. China), Hongbo Li (Harbin Institute of Technology at Zhangjiakou, P.R. China), Guizhong Wang (Harbin Institute of Technology at Zhangjiakou, P.R. China), Yingwei Hou (Harbin Institute of Technology at Zhangjiakou, P.R. China), Abebe Tilahun Tadie (Harbin Institute of Technology, P.R. China)	1571
<i>Stability Analysis for SSR of DFIG-Based Wind Farm Considering STATCOM Capacity Constraint</i>	
Ning Li (Beijing Institute of Technology, P.R. China), Liang Wang (Beijing Institute of Technology, P.R. China), Hongtai Yang (Beijing Institute of Technology, P.R. China), Hongwei Ma (Beijing Institute of Technology, P.R. China)	1576
<i>A Control Strategy for Double Fed Induction Wind Generator Participating in System Frequency Regulation</i>	
Hongtai Yang (Beijing Institute of Technology, P.R. China), Liang Wang (Beijing Institute of Technology, P.R. China), Ning Li (Beijing Institute of Technology, P.R. China), Hongwei Ma (Beijing Institute of Technology, P.R. China)	1582
<i>Modeling Wind Turbine Power Curve in Complex Terrain: An Efficient Approach Using Big Data and Machine Learning</i>	
Yongxin Su (Xiangtan University, P.R. China), Zhe Xiao (Xiangtan University, P.R. China), Mao Tan (Xiangtan University, P.R. China), Zexuan Wu (Xiangtan University, P.R. China), Jing Yu (Xiangtan University, P.R. China), Jianghui Hu (Xiangtan University, P.R. China)	1588
<i>A Collaborative Control Strategy of DFIG System with Energy Storage in Weak Grid</i>	
Xiaohe Wang (Zhejiang University, P.R. China, unknown), Dan Sun (Zhejiang University, P.R. China), Chen Zhao (Zhejiang University, P.R. China), Heng Nian (Zhejiang University, P.R. China), Yue Fan (State Grid Qinghai Electric Power Company, P.R. China)	1594
<i>Fundamental Characteristics of Engine Generator Fueled by Hydrogen Generated from NaBH4</i>	
Koki Ishizuka (Tokyo University of Science, Japan), Nobukazu Hoshi (Tokyo University of Science & Faculty of Science & Technology, Japan), Kazuhito Fukuda (DAYTONA, Japan)	1600
<i>Impedance Modeling and Stability Analysis of DFIG System based on Direct Power Control without PLL</i>	
Bin Hu (Zhejiang University, P.R. China), Heng Nian (Zhejiang University, P.R. China), Liang Chen (Zhejiang University, P.R. China), Yunyang Xu (Zhejiang University, P.R. China), Maowei Zhu (Zhejiang University, unknown)	1606
<i>A New Thyristor DC Solid-state Circuit Breaker Capable of Performing Operating Duty</i>	
Jin-Yeol Yu (Pukyong National University, Korea), Jin-Young Kim (Pukyong National University, Korea), Seung-Min Song (Pukyong National University, Korea), Moo-Seok Goh (Pukyong National University, Korea), In-Dong Kim (Pukyong National University, Korea)	1612
<i>A Calculation Method of Asymmetric Faults Current in Three-Phase Four-Wire Synchronverter</i>	
Yuxiang Wu (Hunan University & National Electric Power Conversion and Control Engineering Technology Research Center, P.R. China), Zhikang Shuai (Hunan University, P.R. China), Jingyan Xie (Hunan University & School of Electrical and Information Engineering, P.R. China)	1616

<i>A Self-Adaptive Control Strategy to Suppress Fluctuation of Distributed Photovoltaic Energy in Microgrids with Combined Heat and Power System</i>	
Jiayong Zhao (Zhejiang University, P.R. China), Heng Nian (Zhejiang University, P.R. China), Zhen Zhang (Qinghai Electric Power Company State Grid, P.R. China), Baomin Fang (Qinghai Electric Power Company State Grid, P.R. China), Yanhe Li (Qinghai Electric Power Company State Grid, P.R. China)	1621
<i>Advance Coordinative Control for the PCC Voltage Fluctuation of the Asynchronous Wind Generator Based on the STATCOM with TSC</i>	
Minglei Wang (Harbin Institute of Technology, P.R. China), Xiangyu Wang (Northeast Petroleum University, P.R. China), Ligu Wang (Harbin Institute of Technology, P.R. China), Jinxin Qiao (Harbin Institute of Technology, P.R. China), Dongxin Jin (Harbin Institute of Technology, P.R. China)	1626
<i>Individual Blade Pitch Control for Floating Wind Turbines Bearing the Coupling of Aerodynamic - Hydrodynamic - Mooring Loads</i>	
Feilong Li (Changsha University of Science and Technology, P.R. China), Lawu Zhou (Changsha University of Science and Technology, P.R. China), Ling Li (Changsha University of Science and Technology, P.R. China), Hui Wang (Changsha University of Science and Technology, P.R. China), Hao Guo (Changsha University of Science and Technology, P.R. China), Yu Liang (Changsha University of Science and Technology, P.R. China)	1632
<i>Analysis of Synchronous Frequency Resonance in VSG Based on the Sequence Impedance Models</i>	
Yanxue Yu (Harbin Institute of Technology, P.R. China), Mengxiang Zhang (Harbin Institute of Technology, P.R. China), Musengimana Antoine (Harbin Institute of Technology, P.R. China), Haoyu Li (Harbin Institute of Technology, P.R. China)	1638
<i>Multiple Lyapunov Function-Based Large Signal Stability Analysis of DC Microgrid with Coordinated Control</i>	
Sucheng Liu (Anhui University of Technology, P.R. China), Jiazhu Zheng (Anhui University of Technology, P.R. China), Run Li (Anhui University of Technology, P.R. China), Xiang Li (Anhui University of Technology, P.R. China), Wei Fang (Anhui University of Technology, P.R. China), Xiaodong Liu (Anhui University of Technology, P.R. China)	1644

## Renewable Energy Systems (NB)

<i>Research on Spatio-temporal Characteristics and Aggregation Algorithm of Wind Power Uncertainty Function</i>	
Likun Wang (Harbin Institute of Technology, P.R. China), Zhizhong Guo (Harbin Institute of Technology, P.R. China), Yue Chen (Harbin Institute of Technology, P.R. China), Hongbo Li (Harbin Institute of Technology at Zhangjiakou, P.R. China), Guizhong Wang (Harbin Institute of Technology at Zhangjiakou, P.R. China), Yingwei Hou (Harbin Institute of Technology at Zhangjiakou, P.R. China)	1650
<i>Kinetic Energy based Rotor Speed Control for the PMSG-WECS Considering the losses</i>	
Ying Zhu (Hohai University, unknown), Sheng Liu (Hohai University, P.R. China), Jun Hang (Anhui University, unknown)	1655
<i>Power Definition for Three-Phase Unbalanced Power System Based on Tan-Sun Coordinate Transformation System</i>	
Guangjun Tan (Yanshan University, P.R. China), Xiaofeng Sun (Yanshan University, P.R. China), Weidong Xu (Shijiazhuang Tonhe Electronics Technologies Co., Ltd, P.R. China), Hongpo Wang (Shijiazhuang Tonhe Electronics Technologies Co., Ltd, P.R. China), Song Li (Shijiazhuang Tonhe Electronics Technologies Co., Ltd, P.R. China)	1660
<i>Distributed Hour-Ahead Demand Response in Microgrid with Wind Power Generation by Considering Power Flow Constraints</i>	
Kuo Feng (City University of Hong Kong, Hong Kong), Chunhua Liu (City University of Hong Kong, Hong Kong)	1666
<i>Research On High Rate Lithium-ion Batteries For Electromagnetic Launcher</i>	
Xinlin Long (National Key Laboratory of Science and Technology on Vessel Integrated Power System, P.R. China), Junyong Lu (Naval University of Engineering, P.R. China)	1671
<i>A Distributed Fixed-Time Secondary Controller for DC Microgrids</i>	
Rui Huang (Harbin Institute of Technology, P.R. China), Panbao Wang (Harbin Institute of Technology, P.R. China), Mohamed Zaery (Harbin Institute of Technology & Aswan University, P.R. China), Wang Wei (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China)	1676
<i>The Simulink of a stacked Large-Scale Photovoltaic Power Generation System</i>	
Wang Hailin (Xi'an Jiaotong University, P.R. China), Tianhua Zhu (Xi'an Jiaotong University, P.R. China), Feng Wang (Xi'an Jiaotong University, P.R. China), Ziqian Zhang (Graz University of Technology, P.R. China), Zhuo Fang (Xi'an Jiaotong University, P.R. China)	1682
<i>A MPPT Algorithm based on PSO for PV Array Under Partially Shaded Condition</i>	
Guihua Liu (Harbin Institute of Technology, P.R. China), Jianing Zhu (Harbin Institute of Technology, P.R. China), Hailiang Tao (Harbin Institute of Technology, P.R. China), Wang Wei (Harbin Institute of Technology, P.R. China), Frede Blaabjerg (Aalborg University, Denmark)	1687

<i>Research on simulation technology of megawatt wind turbine based on three-phase asynchronous motor</i>	
Fengqin Huang (Hunan University, P.R. China), Shoudao Huang (Hunan University, P.R. China), Jinping Xie (Hunan University, P.R. China), Yuxing Dai (Wenzhou University, P.R. China), Xuan WU (Hunan University, P.R. China) .....	1692
<i>Dual-Loop Compensation Voltage Control for Linear Switched Reluctance Generators</i>	
Peng Xiao (Shenzhen University, P.R. China), Jianfei Pan (Shenzhen University, P.R. China), Can Wang (Shenzhen University, P.R. China), Ren Huang (Shenzhen University, P.R. China), Pengfei Fu (Shenzhen University, P.R. China) .....	1697
<i>Experimental Studies on Dynamic Performances of Wind Power Plants Composed of Series-connected Wind Generators and Synchronous-compensator-commutated Thyristor Inverter</i>	
Fujio Tatsuta (Tokyo Denki University, Japan), Shoji Nishikata (Tokyo Denki University, Japan) .....	1702
<i>A Novel Variable step sized MPPT Control based on P&amp;O Method for Photovoltaic System</i>	
Jichan Kim (Chungnam National University & Daejeon Metropolitan Rapid Transit Corporation, Korea), Hanju Cha (Chungnam National University, Korea) .....	1708
<i>Bi-level optimized operation strategy for interconnected microgrids</i>	
Dehong Liu (Tianjin University, P.R. China), Xiangyu Kong (Tianjin University, P.R. China), Deqian Kong (Tianjin University, P.R. China), Shuping Quan (Tianjin University, P.R. China), Chengsi Yong (State Grid Jiangsu Power Co., Ltd., P.R. China), Delong Dong (State Grid Tianjin Electric Power Company, P.R. China) .....	1713
<i>Distributed collaborative control strategy for integrated energy microgrid based on multi-agent system</i>	
Changbin Hu (North China University of Technology & Inverter Technologies Engineering Research Center of Beijing, P.R. China), Shiwei Li (North China University of Technology, P.R. China), Shanna Luo (North China University of Technology, P.R. China) .....	1719
<i>Study on Coordinated Control Strategy of Multi-type Power generators Joint Operation to Meet Large-scale Clean Energy Integration</i>	
Ruihao Jiao (North China Electric Power University, P.R. China), Pu Feng (Huadian United (Beijing) Power Engineering Co., Ltd., P.R. China), Gaoqiang Qu (State Grid Ningxia Electric Power Company, P.R. China), Xinyuan Shen (State Grid Ningxia Electric Power Company, P.R. China), Jianwen Ren (North China Electric Power University, P.R. China), Yang Liu (Northeast Branch of State Grid Corporation of China, P.R. China) .....	1725
<i>Model Predictive Control-based Coordinated Control Strategy in a VSC-MTDC System</i>	
Guanyu Zhou (China University of Petroleum (East China), P.R. China), Wenzhong Ma (China University of Petroleum (East China), P.R. China) .....	1730
<i>Short-Term Wind Power Forecasting Method Based on Mode Decomposition and Feature Extraction</i>	
Chuang Li (Tianjin University, P.R. China), Xiangyu Kong (Tianjin University, P.R. China) .....	1735

## Renewable Energy Systems (NC)

<i>Multi-time Scale Energy-Management Strategy Based on Rule Reasoning for Stand-alone Microgrid</i>	
Wu Meina (Wuhan New Energy Access Equipment and Technology Research Institute Co. Ltd., P.R. China), Liang Zhou (National Key Laboratory for Vessel Integrated Power System Technology, P.R. China), An Hu (Wuhan New Energy Access Equipment and Technology Research Institute Co. Ltd., P.R. China) .....	1740
<i>Consensus Based State of Charge Balancing Control for Multiple DESUs in Islanded Microgrid</i>	
Lei Qi (Yanshan University, P.R. China), Xiaofeng Sun (Yanshan University, P.R. China), Huxiang Zhang (Shi Jiazhuang Kelin Electric Co., Ltd., P.R. China), Zhiguo Zhao (Shi Jiazhuang Kelin Electric Co., Ltd., P.R. China), Huidong Li (Shi Jiazhuang Kelin Electric Co., Ltd., P.R. China) .....	1745
<i>A Novel Predictive Direct Power Control of Doubly Fed Induction Generator based on ADRC method</i>	
Di Zhang (Yanshan University, P.R. China), Yanjun Wei (Yanshan University, P.R. China), Jinlong Zhang (Electrical Engineering College, Yanshan University, P.R. China), Hanhong Qi (Yanshan University, P.R. China) .....	1749
<i>Passivity Based Impedance Shaping Method for LCL Filtered Voltage Source Converter</i>	
Huaiyuan Liu (Harbin Institute of Technology, P.R. China), Jian Wu (Harbin Institute of Technology, P.R. China), Lei Li (Harbin Institute of Technology, P.R. China), Yuchao Liu (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China), Qiang Gao (Harbin Institute of Technology (HIT), P.R. China) .....	1753
<i>Dual active bridge converter based battery charger in stand-alone wind power generation system with high-inertia wind turbine</i>	
Hiroaki Yamada (Yamaguchi University, Japan), Yuto Takayama (Yamaguchi University, Japan) .....	1759
<i>A Grid Impedance Identification Method Based on Complex Coefficient Filter Considering DC Offset Effects</i>	
Leilei Guo (Zhengzhou University of Light Industry, P.R. China), Congcong Zhu (Zhengzhou University of Light Industry, P.R. China), Nan Jin (Zhengzhou University of Light Industry, P.R. China), Linwang Dai (China Electric Power Research Institute, P.R. China), Yanyan Li (Zhengzhou University of Light Industry, P.R. China), Yishu Sun (Zhengzhou University of Light Industry, P.R. China) .....	1764

<i>Bi-level Programming Model for Distribution Generation in Active Distribution Network Considering Static Island Power Supply Restoration Strategy</i>	
Ying Chen (South China University of Technology, P.R. China), Ping Yang (South China University of Technology, P.R. China) .....	1770
<i>Research on A Forecasting Model of Wind Power based on Recurrent Neural Network with Long Short-term Memory</i>	
Anying Li (Northwestern Polytechnical University, P.R. China), Lei Cheng (Beijing Chengshi Weilai Technology Co. Ltd, P.R. China) .....	1776
<i>Active Support Control Strategy of Permanent Magnet Synchronous Wind Turbine and Its Adaptability Analysis under Weak Grid</i>	
Yanfeng Ge (Liaoning Province Electricity Power Company Ltd, P.R. China), Ying Sun (Northeast Electric Power University, P.R. China), Chuang Liu (Northeast Electric Power University, P.R. China), Xiaoyu Yang (Northeast Electric Power University, P.R. China), Tong Sun (Northeast Electric Power University, P.R. China) .....	1780
<i>Wind Power Forecasting by Using Artificial Neural Networks and Grubbs Criterion</i>	
Jianli Zhao (Inner Mongolia electric power science and research institute, P.R. China), Jiguang Wu (Inner Mongolia Electric Power (Group) Co., Ltd., Hohhot, P.R. China), Geping Bai (Inner Mongolia Electric Power (Group) Co., Ltd., Hohhot, P.R. China), Yingjun Li (Ulaanchab Electric Power Bureau, P.R. China) .....	1786
<i>Fault Characteristic Analysis of a Permanent Magnet Synchronous Generator-based Wind Farm</i>	
Wei Chen (Zhejiang University, P.R. China), Taiying Zheng (Zhejiang University, P.R. China), Junfei Han (Inner Mongolia Electric Power Research Institute, P.R. China) .....	1791
<i>Planning of Distributed Generation in the Hybrid AC/DC distribution network considering the Solid State Transformer</i>	
Jiyong Shi (Tianjin University, P.R. China), Wen Qiao (Tianjin University, P.R. China), Fei Xue (Ningxia Electric Power Limited Company, P.R. China), Li Ma (State Grid Tianjin Electric Power Company, P.R. China), Wenjing Yang (Tianjin University, P.R. China), Ting Yang (Tianjin University, P.R. China) .....	1798
<i>An improved reactive power control strategy for the parallel inverter system based on VSG</i>	
Yixiang Jing (Harbin Institute of Technology, P.R. China) .....	1804
<i>Multi-objective Reactive Power Optimization for Distribution System With Distributed Generators</i>	
Pei Luo (Xiangtan University, P.R. China), Jihao Sun (Xiangtan University, P.R. China), Yuting Wang (Xiangtan University & School of Information Engineering, P.R. China) .....	1810
<i>Optimized Operation of Multi-energy System in the Industrial Park Based on Integrated Demand Response Strategy</i>	
Jintao Chen (South China University of Technology, P.R. China), Ping Yang (South China University of Technology, P.R. China) .....	1816
<i>A Flexible Harmonic Voltage and Current Compensation Method for A Single-Phase Multi-Bus System</i>	
Junfei Han (Inner Mongolia Power Group Corporation, P.R. China), Yifan Zhang (Inner Mongolia Power Group Corporation, P.R. China), Yu Liu (University of Tianjin, P.R. China) .....	1822
<i>Research on the accuracy of Large Inertia Wind Turbine Emulator</i>	
Honghao Guo (Nanjing University of Posts and Telecommunications, P.R. China), Huajie Zeng (Nanjing University of Posts and Telecommunications, P.R. China), Qiangang Guo (Nanjing University of Posts and Telecommunications, P.R. China) .....	1826

## Renewable Energy Systems (ND)

<i>An adaptive Virtual Impedance Control Method to Enhance PCC Voltage Quality of Islanded Microgrid</i>	
Yifan Zhang (Inner Mongolia Power Group Corporation, P.R. China), Junfei Han (Inner Mongolia Power Group Corporation, P.R. China), Shibo Wang (Shandong Electric Power Research Institute, P.R. China), Zhe Dong (University of Tianjin, P.R. China) .....	1831
<i>Research on Parallel Energy Management of Multi-DC Microgrid with Hybrid Energy Storage System</i>	
Chunxue Wen (North China University of Technology, P.R. China), Wei Dai (North China University of Technology, P.R. China), YuHang Li (North China University of Technology, P.R. China) .....	1836
<i>Power Forecasting of Photovoltaic Generation Based on Multiple Linear Regression Method with Real-time Correction Term</i>	
Zhiwei Xu (Tsinghua University, P.R. China), Geng Yang (Tsinghua University, P.R. China), Hua Geng (Tsinghua University, P.R. China) .....	1842
<i>Dynamic pricing of demand response based on elasticity transfer and reinforcement learning</i>	
Deqian Kong (Tianjin University, P.R. China), Xiangyu Kong (Tianjin University, P.R. China), Jie Xiao (Tianjin University, P.R. China), Jian Zhang (State Grid Tianjin Electric Power Company, P.R. China), Siwei Li (Beijing Fibrlink Corporation Company, P.R. China), Liang Yue (Beijing Fibrlink Corporation Company, P.R. China) .....	1846

<i>A LSTM Based Wind Power Forecasting Method Considering Wind Frequency Components and Wind Turbine States</i> Yongxin Su (Xiangtan University, P.R. China), Jing Yu (Xiangtan University, P.R. China), Mao Tan (Xiangtan University, P.R. China), Zexuan Wu (Xiangtan University, P.R. China), Zhe Xiao (Xiangtan University, P.R. China), Jianghui Hu (Xiangtan University, P.R. China) .....	1851
<i>Background Voltage Harmonic Suppression Strategy of a Distribution Network</i> Xiaofeng Sun (Yanshan University, P.R. China), Min Zhang (Yanshan University, P.R. China), Hua Wang (State Grid North Hebei Zunhua Power Supply Branch, P.R. China), Xiaofeng Ma (Shijiazhuang Tonhe Electronics Technologies Co. Ltd, P.R. China), Ping Wang (Shandong Huayu University of Technology, P.R. China) .....	1857
<i>Hybrid Power System using PV and Piezoelectric Modules</i> Dong-Hee Lee (Kyungsoong University, Korea), JunHwi Park (Kyungsoong University, Korea) .....	1862
<i>Voltage Segment Coordinated Control Strategy for Isolated DC Microgrid with Multiple Energy Storage Units</i> Lirong Zhang (Beijing Polytechnic, P.R. China), Yunli Zhu (Beijing Polytechnic, P.R. China), Ying Xiao (Beijing Polytechnic, P.R. China) .....	1868
<i>Virtual Synchronous Generator Design Based Modular Multilevel Converter for Microgrid Frequency Regulation</i> Hossam Ali (School of Electrical Engineering and Automation, Harbin Institute of Technology, P.R. China), Binbin Li (School of Electrical Engineering and Automation, Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China), Zigao Xu (Harbin Institute of Technology, P.R. China), Huaiyuan Liu (Harbin Institute of Technology, P.R. China) .....	1873
<i>Adaptive Maximum Power Point Tracking Control Strategy for Variable-Speed Wind Energy Conversion Systems with Constant Tracking Speed</i> Kuncheng Cai (Chongqing University, P.R. China), Jiawei Chen (Chongqing University, P.R. China) .....	1879
<i>Virtual Impedance Adaptive Study of Parallel Virtual Synchronous Generators</i> YaoZhi Huang (North China University of Technology, P.R. China), Chunxue Wen (North China University of Technology, P.R. China), Qi Xiong (North China University of Technology, P.R. China) .....	1884
<i>Power Control of Distributed Energy Storage System in Bipolar DC Microgrid</i> Chunjiang Zhang (Yanshan University, P.R. China), Meng Jiao (Yanshan University, P.R. China), Mengna Liang (Yanshan University, P.R. China), Ming Liu (Yanshan University, P.R. China), Zhizhong Kan (Yanshan University, P.R. China) .....	1890
<i>VSG Current Balance Control Strategy Under Unbalanced Grid Voltage</i> Wu Jian (Harbin HIT, P.R. China) .....	1896

## Energy Efficiency Systems (RA)

<i>Multi-user power optimization based on multi-objective grey wolf Optimizer</i> Bo Zhou (Xiangtan University, P.R. China), Jiangyong Liu (Xiangtan University, P.R. China), Lingzhi Yi (Xiangtan University, P.R. China) .....	1902
<i>Online Monitor Model of Induction Motor Efficiency Based on Data Analysis</i> Xin Zhao (Tianjin University, P.R. China), Xiangyu Kong (Tianjin University, P.R. China), Ying Chen (Nanyang Technology University, Singapore), Yuying Ma (Tianjin University, P.R. China) .....	1908
<i>Multi-objective optimization scheduling method for integrated energy system considering uncertainty</i> Jie Xiao (Tianjin University, P.R. China), Xiangyu Kong (Tianjin University, P.R. China), Dehong Liu (Tianjin University, P.R. China), Ye Li (State Grid Tianjin Electric Power Company, P.R. China), Delong Dong (State Grid Tianjin Electric Power Company, P.R. China), Yanan Qiao (State Grid Tianjin Electric Power Company, P.R. China) .....	1913
<i>Statistics and Analysis of Power Consumption Data Based on Big Data</i> Qingzhu Wan (North China University of Technology, P.R. China), Yi Yu (North China University of Technology, P.R. China), Kaicong Wu (North China University of Technology, P.R. China), Jiayao Li (North China University of Technology, P.R. China), Weina Liu (North China University of Technology, P.R. China) .....	1918

## Reliability and Diagnostics (OA)

<i>Fault Detection and Compensation Strategy of Brushless DC Motor with Fault in Hall Sensors</i> Xi Zhang (Northwestern Polytechnical University, P.R. China), Hui Lin (Northwestern Polytechnical University, P.R. China), Yiyun Zhao (Northwestern Polytechnical University, P.R. China) .....	1923
<i>Detection and Localization of Partial Discharge Based on Flexible Piezoelectric Thin Film Material</i> Zhiwei Wen (Institute of Electrical Engineering, P.R. China), Xiong Bin (Chinese Academy of Sciences, unknown), Gu Guobiao (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China) .....	1929

<i>Summary of Fault Characteristics of Thyristor in HVDC Converter Valve Under Over-voltage Condition</i>	
Jiachen Tian (Xi'an Jiaotong University, P.R. China), Gou Yating (Xi'an Jiaotong University, P.R. China), Liu Cuicui (Xi'an Jiaotong University, P.R. China), Ziqian Zhang (Graz University of Technology, P.R. China), Gao Chong (Global Energy Interconnection, P.R. China), Zhou Jianhui (Global Energy Interconnection, P.R. China), Zhang Jing (Global Energy Interconnection, P.R. China), Zhuo Fang (Xi'an Jiaotong University, P.R. China), Feng Wang (Xi'an Jiaotong University, P.R. China)	1933
<i>Open-circuit Fault Diagnosis Strategy for Dual-winding Permanent Magnet Motor Based on High Frequency Current Signal Injection Method</i>	
Shaoshuai Wang (Nanjing University of Science and Technology, P.R. China), Qiang Li (Nanjing University of Science and Technology, P.R. China), Xuefeng Jiang (Nanjing University of Science and Technology, P.R. China), Da Xu (Nanjing University of Science and Technology, unknown), Yunzhi Li (Nanjing University of Science and Technology, P.R. China), Yufei Gao (Nanjing University of Science and Technology, P.R. China)	1937
<i>Reliability Evaluation Method for Robot Servo System Based on Accelerated Degradation Test</i>	
Han Wang (Harbin Institute of Technology, P.R. China), Zeyu Zhang (Harbin Institute of Technology, P.R. China), Jiang Long (Harbin Institute of Technology, P.R. China), Lu Wang (Harbin Institute of Technology, P.R. China), Xuerong Ye (Harbin Institute of Technology, P.R. China)	1942
<i>Testability Study of Medium Voltage DC Switchboard Based on Testability Index</i>	
Weichao Wang (Naval University of Engineering, P.R. China), Weiqiang Zhan (Naval University of Engineering, P.R. China)	1948
<i>Online detection method for internal fault of permanent magnet synchronous generator based on new type of search coil</i>	
Daizong Tian (Tsinghua University, P.R. China), Yuguang Sun (Tsinghua University, P.R. China), Wei Du (Tsinghua University, P.R. China), Lin Gui (Tsinghua University, P.R. China)	1953
<i>Assessing the Impacts of Weather Conditions on the Reliability of UHVDC Converter Valve</i>	
Jiangnan Chen (Xi'an Jiaotong University, P.R. China), Gao Chong (Global Energy Interconnection, P.R. China), Zhou Jianhui (Global Energy Interconnection, P.R. China), Zhang Jing (Global Energy Interconnection, P.R. China), Fang Zhuo (Xi'an Jiaotong University, P.R. China), Feng Wang (Xi'an Jiaotong University, P.R. China)	1959
<i>Reliability Evaluation of a Modified Y-source Inverter in Photo-voltaic Application</i>	
Jiabao Jiang (Harbin Institute of Technology, P.R. China)	1965
<i>Analysis and Design of Fault-Tolerant Control of ANPC Inverter for Traction System</i>	
Dong Yang (Key Laboratory of Power Electronics and Electric Drive, Institute of Electrical Engineering & University of Chinese Academy of Sciences, P.R. China), Rong Wei (Institute of Electrical Engineering, P.R. China), Pengkun Sun (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Zhan Gao (Key Laboratory of Power Electronics and Electric Drive, Institute of Electrical Engineering & University of Chinese Academy of Sciences, P.R. China), Yaohua Li (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Xiaoxin Wang (Institute of Electrical Engineering, P.R. China)	1971
<i>A Novel Method for Monitoring the Junction Temperature of SiC MOSFET On-line Based on On-state Resistance</i>	
Qinghao Zhang (Tsinghua University, P.R. China), Yanyong Yang (Tsinghua University, P.R. China), Pinjia Zhang (Tsinghua University, P.R. China)	1975
<i>Research on Interturn Short Circuit Fault Identification Method of PMSM based on Deep Learning</i>	
Sen Wang (Shenyang Institute of Engineering, P.R. China), Jieqiu Bao (Shenyang Institute of Engineering, P.R. China), Siyang Li (China Electric Power Equipment, P.R. China), Hongkui Yan (Shenyang Institute Of Engineering, P.R. China), Tianyao Tang (Shenyang Institute of Engineering, P.R. China), Di Tang (Shenyang Institute of Engineering, P.R. China)	1980
<i>Influence of Over-voltage Condition Brought by HEMP, Lightning Over-voltage and Operating Over-voltage during Commutation Period on Reliability of HVDC Converter Valve</i>	
Jiachen Tian (Xi'an Jiaotong University, P.R. China), Ma Chunyan (China Electric Power Research Institute, P.R. China), Duan Qing (China Electric Power Research Institute, P.R. China), Ziqian Zhang (McGill University, Canada), Feng Wang (Xi'an Jiaotong University, P.R. China), Zhuo Fang (Xi'an Jiaotong University, P.R. China), Hao Yi (School of Electrical Engineering of Xi'an Jiaotong University, P.R. China)	1984
<i>A Method of Open Circuit Fault Diagnosis for Five-phase Permanent Magnet Synchronous Motor Based on Wavelet Analysis</i>	
Meng Shao (Harbin Institute of Technology, P.R. China), Guijie Yang (Harbin Institute of Technology (HIT), P.R. China), Guodong Sun (Harbin Institute of Technology, P.R. China), Jianyong Su (Harbin Institute of Technology (HIT), P.R. China)	1988
<i>Reliability Tolerance Analysis of WPT System Based on Series-Parallel Compensation</i>	
Xiuping Su (Hebei University of Technology, P.R. China), Siye Mu (Hebei University of Technology, P.R. China), Luqi Wang (Hebei University of Technology, P.R. China), Xiaoyue Wang (Hebei University of Technology, P.R. China), Haofeng Cheng (Hebei University of Technology, P.R. China), Shiqiang Yuan (Hebei University of Technology, P.R. China)	1994

## Reliability and Diagnostics (OB)

<i>Online Rotor Fault Diagnosis of Permanent Magnet Synchronous Motors Based on Stator Tooth Flux</i> Jiayin Lei (Chongqing University, P.R. China), Song Huang (Chongqing University, P.R. China), Chong Zeng (Chongqing University, P.R. China), Yongming Yang (Chongqing University, P.R. China) .....	1998
<i>Fault-Tolerant Control of Position Sensor for Wound-Rotor Synchronous Starter/Generator</i> Rui Wang (Northwestern Polytechnical University, P.R. China), Weiguo Liu (Northwestern Polytechnic University, P.R. China), Tao Meng (Northwestern Polytechnical University, P.R. China), Chenghao Sun (Northwestern Polytechnical University, P.R. China) .....	2003
<i>Research on Overvoltage Suppression of the Battery Discharging in Electromagnetic Launch</i> Ren Zhou (Naval University of Engineering, P.R. China), Junyong Lu (Naval University of Engineering, P.R. China), Xinlin Long (Naval University of Engineering, P.R. China), Lang Liu (Naval University of Engineering, P.R. China), Yingquan Liu (Naval University of Engineering, P.R. China), Yiting Wu (Naval University of Engineering, P.R. China) .....	2009
<i>Transformer Winding Deformation Diagnosis Based on Signal Distance</i> Shengmin Li (Xi'an University of Technology, P.R. China), Dan Zhao (Xi'an University of Technology, P.R. China), Yuanyuan He (Xi'an University of Technology, P.R. China) .....	2015
<i>Identification of Transformer Winding Deformation Fault Type Based on Signal Distance and SVM</i> Shengmin Li (Xi'an University of Technology, P.R. China), Dan Zhao (Xi'an University of Technology, P.R. China), Xiaofan Wang (Xi'an University of Technology, P.R. China) .....	2021
<i>Survey of Life Prediction and Failure Analysis of IGBT Modules Based on Accelerated Aging Test</i> Yangjie Bao (University of Shanghai for Science and Technology, P.R. China), Quan Jiang (University of Shanghai for Science and Technology, P.R. China) .....	2027
<i>Design of Intelligent Fault Diagnosis And Remote Supporting System</i> Zhi Qiang Zhang (Tianjin University, P.R. China) .....	2032
<i>The optimized lifetime model of DC-link capacitor considering power module faults in Traction drive system</i> Bo Yao (Southwest Jiaotong University, P.R. China), Dong Xie (Southwest Jiaotong University, P.R. China), Yichi Zhang (Southwest Jiaotong University, P.R. China), Xing-Lai Ge (Southwest Jiaotong University, P.R. China), Bin Gou (Nanyang Technological University, Singapore) .....	2038
<i>Detection of Bearing Outer Race Fault in Induction Motors using Motor Current Signature Analysis</i> Xiangjin Song (Jiangsu University, P.R. China), Zhaowei Wang (School of Electrical and Information Engineering, Jiangsu University, P.R. China), Jingtao Hu (Shenyang Institute of Automation, Chinese Academy of Sciences, P.R. China) .....	2042
<i>Reliable spatial configuration strategy of fault current limiters in multi-terminal HVDC system</i> Song Tang (Zhe Jiang University, P.R. China), Guanlong Jia (Zhe Jiang University, P.R. China), Chenghao Zhang (Zhe Jiang University, P.R. China), Min Chen (Zhejiang University, P.R. China) .....	2047
<i>Research on Fault Characteristics of Direct-drive Permanent Synchronous Motor with Stator Winding Inter-turn Short Circuit Fault</i> Caixia Gao (Henan Polytechnic University, P.R. China), Ke Lv (Henan Polytechnic University, P.R. China), Jikai Si (Zhengzhou University, P.R. China), Feng Haichao (Henan Polytechnic University, P.R. China), Xiaozhuo Xu (Henan Polytechnic University, P.R. China) .....	2051
<i>Rotor Bar Fault Diagnosis of Squirrel Cage Asynchronous Motors based on Adaptive Notch Filters</i> Zhi Li (China University of Petroleum (East China), P.R. China), Hailiang Xu (China University of Petroleum (East China), P.R. China), Yansong Wang (China University of Petroleum (East China), P.R. China) .....	2056

## Noise, Vibration, EMI and EMC (PA)

<i>Analysis for the vibration characteristics of the induction machine in different operating status</i> Depeng Zeng (Harbin Engineering University, P.R. China), Jibin Zou (Harbin Institute of Technology, P.R. China), Yongxiang Xu (Harbin Institute of Technology (HIT), P.R. China) .....	2060
<i>PWM Frequency Noise Reduction in Dual-Segment Three-Phase PMSM with Magnetically Coupled Inductors and Parallel Interleaved Inverters</i> Huidong Huang (Harbin Institute of Technology, P.R. China), Wentao Zhang (Harbin Institute of Technology, P.R. China), Yongxiang Xu (Harbin Institute of Technology (HIT), P.R. China), Jibin Zou (Harbin Institute of Technology, P.R. China) .....	2065
<i>Convex Combination Recursive Even Mirror Fourier Nonlinear filter for Nonlinear Active Noise Control</i> Xinnian Guo (Huaiyin Institute of Technology, P.R. China), Jean Jiang (Purdue University Northwest, USA), Jungan Chen (Zhejiang Wanli University, P.R. China), Li Tan (Purdue University Northwest, USA), Sidan Du (Nanjing University, P.R. China) .....	2070



<i>Research on Vibration and Noise Characteristic of Converter Transformer Under DC Bias</i> Jiazhu Xu (Hunan University, P.R. China), Jie Zhou (Hunan University, P.R. China), Yaqian Yang (Hunan University, P.R. China) .....	2076
<i>A Hybrid Calculation Method of Radial Electromagnetic Force Based on Finite Element Method and Analytic Method in A Permanent Magnet Synchronous Machine</i> Taiyang Dai (Chongqing University, P.R. China), Hui Li (Chongqing University, P.R. China), Jianfu Li (Chongqing University & Dongfang Electric Machinery Co., Ltd, P.R. China), Bin Yuan (Chongqing University, P.R. China), Xiaoyu Liu (Chongqing University, P.R. China) .....	2081
<i>Application of Chaotic Pulse Width Modulation in Suppressing Characteristic Frequency Vibration of Magnetic Bearing</i> Jianshan Wang (Naval University of Engineering, P.R. China), Junquan Chen (Naval University of Engineering, unknown), Jinghua Hu (Naval University of Engineering, P.R. China), Zhenzhong Su (Naval University of Engineering, P.R. China), Chao Wu (Naval University of Engineering, P.R. China), Dong Wang (Institute of Power Electronics Technology, NUE, P.R. China) .....	2085
<i>Analysis and Experimental Validation of Rotor Optimal Design on the Noise Reduction of Permanent Magnet Synchronous Motor for Electric Vehicle</i> Yang Liu (Wuhan Institute of Marine Electric Propulsion, P.R. China), Xu Xiaohui (Wuhan Institute of Marine Electric Propulsion, P.R. China), Gao Yang (Wuhan Institute of Marine Electric Propulsion, P.R. China), Changpeng Lv (Wuhan Institute of Marine Electric Propulsion, P.R. China) .....	2091
<i>Eccentricity Fault Modeling in Excitation Synchronous Machine</i> Yunliu Xu (Huazhong University of Science and Technology, P.R. China), Tianle Li (Huazhong University of Science and Technology, P.R. China), Xing Wang (Huazhong University of Science and Technology, P.R. China), Kai Yang (Huazhong University of Science and Technology, P.R. China), Linwei Hu (Huazhong University of Science and Technology, unknown) .....	2097
<i>Study of Vibration on Permanent Magnet Synchronous Motor Base on Static Eccentricity Model</i> Zhao Suzhen (Gree Electric Appliances, Inc. of Zhuhai, P.R. China) .....	2101
<i>Analysis and Reduction of Conducted Interference of a Full SiC Inverter</i> Dong Zhang (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Tao Fan (Chinese Academy of Sciences, P.R. China) .....	2106
<i>Research on Multi-objective Optimization for The Key Parameters of Modal Analysis on Induction Motor</i> YuSheng Hu (State Key Laboratory of Air-conditioning Equipment and System Energy Conservation, P.R. China), Bin Chen (State Key Laboratory of Air-conditioning Equipment and System Energy Conservation, unknown), Suhua Lu (GREE, P.R. China), Siyuan Liu (GREE, P.R. China), Liyi Li (Harbin Institute of Technology (HIT), P.R. China) .....	2110
<i>Dynamic modelling and vibration analysis of dual-rotor system with inter-shaft sprag clutch and bearings</i> Chuang Huang (Harbin Institute of Technology, P.R. China), Yongqiang Zhao (Harbin Institute of Technology, P.R. China), Ming Liu (Harbin Institute of Technology, P.R. China), Zhen Fu (China FAW Group Corporation, P.R. China) .....	2116

## Cooling Technologies (PA)

<i>Investigating the Influence of Rotation Speed on Ventilation System of Traction Motors to Driving High-speed EMUs</i> Yun Feng (University of Chinese Academy of Sciences, P.R. China), Xiong Bin (Chinese Academy of Sciences, unknown) .....	2121
<i>The Experimental Study on Self-driven Evaporative Cooling System In Large Capacity Permanent Magnet Machine</i> Xiong Bin (Chinese Academy of Sciences, unknown), Yun Feng (University of Chinese Academy of Sciences, P.R. China) .....	2126
<i>Thermal Analysis and Cooling Structure Design of Axial Flux Permanent Magnet Synchronous Motor for Electrical Vehicle</i> Wanqiu Liu (Shanghai University, P.R. China), Ying Dai (Shanghai University, P.R. China), Jianfei Zhao (Shanghai University, P.R. China), Xiaofei Wang (Shanghai University, P.R. China) .....	2131

## Cooling Technologies (PB)

<i>Thermal Barrier for High-voltage Permanent Magnet Synchronous Motor with Air-cooling Hybrid Ventilation Systems</i> Xiaochen Zhang (Beijing Jiaotong University, P.R. China & The University of Nottingham, United Kingdom (Great Britain)), He Zhang (University of Nottingham Ningbo China, P.R. China), Weili Li (Beijing Jiaotong University, P.R. China), Chris Gerada (University of Nottingham, United Kingdom (Great Britain)), David Gerada (University of Nottingham, United Kingdom (Great Britain)), Jing Li (University of Nottingham Ningbo China, P.R. China) .....	2137
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------

<i>Thermal Analysis of Metallized Film Capacitors Used in Motor Drive Controller</i>	
Ye Li (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Tao Fan (Chinese Academy of Sciences, P.R. China), Qi Li (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Hui Xu Wen (Institute of Electrical Engineering Chinese Academy of Sciences & Key Laboratory of Power Electronics and Electric Drive, P.R. China), Dong Zhang (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China)	2141
<i>Design and Optimization Analysis of Composite Water Cooling System Based on High Power Density Motor</i>	
Shaopeng Wu (Harbin Institute of Technology & Institute of Electromagnetic and Electronic Technology, P.R. China), Chenchen Tian (Harbin Institute of Technology, P.R. China), Pinjia Zhang (Tsinghua University, P.R. China), Xiaojian Huang (Harbin Institute of Technology, P.R. China), Xinyue Shan (Harbin Institute of Technology, P.R. China)	2145
<i>Thermal Investigation and Cooling Enhancement of Axial Flux Permanent Magnet Motors for Vehicle Applications</i>	
Feng Chai (Harbin Institute of Technology, P.R. China), Yunlong Bi (Harbin Institute of Technology, P.R. China), Lei Chen (Harbin Institute of Technology, P.R. China)	2151
<i>Cooling Analysis of Vehicle Hub Motor Temperature Field</i>	
Bo Pan (Harbin University of Science and Technology, P.R. China)	2156
<i>Design and Analysis of Cooling System for 3.2MW Split-type Permanent Magnet Direct-driven Wind Turbine Generator</i>	
Jinpeng Fan (Shenyang University of Technology, P.R. China), Yanfeng Tian (Shenyang University of Technology, P.R. China), Xing Zuoxia (Shenyang University of Technology, P.R. China)	2162

## Permanent Magnet Motors and Drives (AA)

<i>Research on High Power Density SiC Mosfet Driver Circuit</i>	
Shaokun Zhang (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Guolin He (Institute of Electrical Engineering, CHINESE ACADEMY OF SCIENCES, P.R. China)	2167
<i>Harmonic current minimization in PMSM drive system using feedforward compensation based on torque ripple estimation</i>	
Li Wenshan (Institute of Electrical Engineering, P.R. China), Hui Xu Wen (Institute of Electrical Engineering Chinese Academy of Sciences & Key Laboratory of Power Electronics and Electric Drive, P.R. China), Jian Zhang (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China)	2173
<i>FEA-Based Mathematical Modeling and Simulation for IPMSM Drive with Consideration of Saturation and Cross-Coupling Influence</i>	
Bowen Chen (Zhejiang University, P.R. China), Jianhua Wu (Zhejiang University, P.R. China), Qingguo Sun (Zhejiang University, P.R. China), Hang Wu (Zhejiang University, P.R. China), Le Zhang (Zhejiang Founder Motor Limited Company, P.R. China)	2178
<i>A State Feedback Controller for PMSMs Based on Penalty Term Augmented Seeker Optimization Algorithm</i>	
Changchang Hu (Jiangsu University, P.R. China), Xiaodong Sun (Jiangsu University & Automotive Engineering Research Institute, P.R. China), Zebin Yang (Jiangsu University, P.R. China), Gang Lei (University of Technology Sydney, Australia), Youguang Guo (University of Technology Sydney, Australia), Jianguo Zhu (University of Technology Sydney, Australia)	2183
<i>Discrete adaptive HCC based FS-MPC with constant Switching frequency for PMSM Drives</i>	
Ravi Nath Tripathi (Kyushu Institute of Technology, Japan), Vijay Singh (Kyushu Institute of Technology, Japan), Ipsita Mishra (Kyushu Institute of Technology, Japan), Tsuyoshi Hanamoto (Kyushu Institute of Technology, Japan)	2187
<i>A Robust Commutation Error Correction Method for Brushless DC Motor of Reaction Flywheel</i>	
Haifeng Zhang (Beihang University, P.R. China), Gang Liu (Beihang University, P.R. China), Jinjin Xie (Shanghai Institute of Satellite Engineering, P.R. China)	2193
<i>DC-link Voltage Sliding Mode Control of Z-source Inverter for High Speed Permanent Magnet Motors</i>	
Haokun Wu (Hunan University, P.R. China), Keyuan Huang (Hunan University, P.R. China), Wei Lv (Hunan University, P.R. China), Xiaoling Mo (Hunan University, P.R. China), Shoudao Huang (Hunan University, P.R. China), Jiaxin Zhou (Hunan University, P.R. China)	2199
<i>A Dynamic Compensation Method for Time Delay Effects of High-Speed PMSM Sensorless Digital Drive System</i>	
Wei Lv (Hunan University, P.R. China), Keyuan Huang (Hunan University, P.R. China), Haokun Wu (Hunan University, P.R. China), Xiaoling Mo (Hunan University, P.R. China), Mingbao Shen (Hunan University, P.R. China)	2205
<i>D-q axis inductance characteristics of the consequent-pole motor</i>	
Hui Ma (Nanjing Normal University, P.R. China), Xin Qiu (Nanjing Normal University, P.R. China), Jianfei Yang (Nanjing Normal University, P.R. China), Wenjuan Zhao (Nanjing Normal University, P.R. China), Jiquan Yang (Nanjing Normal University, P.R. China), Dongtao Yuan (Huai'an city, P.R. China)	2210

<i>Inductance Parameter Identification Method of Permanent Magnet Synchronous Motor Based on the HF Rotating Square Wave Voltage Injection</i>	2214
Jiaxin Zhou (Hunan University, P.R. China), Keyuan Huang (Hunan University, P.R. China), Shoudao Huang (Hunan University, P.R. China), Simei Liu (Hunan University, P.R. China), He Zhao (Hunan University, P.R. China), Mingbao Shen (Hunan University, P.R. China)	
<i>Filterless Pseudo-Random High Frequency Square-Wave Voltage Injection for Sensorless IPMSM Drives</i>	2218
Guofeng Yuan (North China University of Technology, unknown), Baoli Zhang (North China University of Technology, P.R. China)	
<i>A Novel Control Method of Improved Flux-Weakening Trajectory for IPMSM</i>	2223
Zhiyong Lan (Xiangtan University, P.R. China), Fanxiang Shen (Xiangtan University, P.R. China), Gang Zhu (Jiangsu Machinery Electronics Group Co., Ltd, P.R. China), Cai Chen (Xiangtan University, P.R. China), Li Li (Xiangtan University, P.R. China), Chuntang Cao (Xiangtan University, P.R. China)	
<i>Sensorless Control for PMSM with Novel Back EMF Observer Based on Quasi-PR Controller</i>	2229
Lin Ji (Harbin Institute of Technology, P.R. China), Yongxiang Xu (Harbin Institute of Technology (HIT), P.R. China), Jibin Zou (Harbin Institute of Technology, P.R. China), Minghui Wang (Harbin Institute of Technology, P.R. China)	
<i>Fault-Tolerant Control of Six-Phase Permanent-Magnet Synchronous Machine Drives Under Open-Phase Faults</i>	2234
Yixiao Feng (Chongqing University, P.R. China), Yong Liao (Chongqing University, P.R. China), Hao Lin (Chongqing University, P.R. China), Luo Cheng Yan (Chongqing University, P.R. China)	
<i>Voltage-Sensorless Model Predictive Current Control for Permanent-Magnet Synchronous Motor Drives</i>	2239
Zhixiang Lu (Southeast University in Nanjing, Jiangsu Province, P.R. China), Wei Wang (Southeast University, P.R. China), Ming Cheng (Southeast University, P.R. China), Wei Hua (Southeast University, P.R. China), Chenxin Tang (Southeast University, P.R. China)	
<i>Analysis of Natural Frequency of the Stator of Interior Permanent Magnet Synchronous Motor</i>	2244
Guanqun Ma (Shandong University, P.R. China), Xiuhe Wang (Shandong University, P.R. China), Daohan Wang (Shandong University, P.R. China), Chao Zhang (Shandong University, P.R. China), Dongwei Qiao (State Grid Taian Power Supply Company, P.R. China)	
<i>Improved PMSM speed control based on a novel sliding-mode load disturbance observer</i>	2249
Guofeng Yuan (North China University of Technology, unknown), Mengying Zuo (North China University of Technology, P.R. China)	

## Permanent Magnet Motors and Drives (AB)

<i>A Novel Fault-Tolerant Topology and Control Method for Open-Winding PMSM System with a Three-Leg Inverter</i>	2254
Xiaoguang Zhang (North China University of Technology, P.R. China), Chi Xu (North China University of Technology, P.R. China), Zhihao Zhao (North China University of Technology, P.R. China)	
<i>Model predictive full-torque control for the dual controlled open winding PMSM</i>	2259
Xiaoguang Zhang (North China University of Technology, P.R. China), Wenhan Zhang (North China University of Technology, P.R. China)	
<i>Direct Torque Control of an Axial Field Flux-Switching Permanent Magnet Machine</i>	2266
Jilong Zhao (Xi'an University of Technology, P.R. China), Xiaowei Quan (Xi'an University of Technology, P.R. China), Shixian Xu (Xi'an University of Technology, P.R. China)	
<i>A Genetic-Taguchi Global Design Optimization Strategy for Surface-Mounted PM Machine</i>	2271
Litao Dai (Hunan University, P.R. China), Jian Gao (Hunan University, P.R. China), Wenjuan Zhang (Changsha University, P.R. China), Shoudao Huang (Hunan University, P.R. China)	
<i>A Genetic-Taguchi Global Design Optimization Strategy for Interior PM Machine</i>	2277
Litao Dai (Hunan University, P.R. China), Jian Gao (Hunan University, P.R. China), Wenjuan Zhang (Changsha University, P.R. China), Shoudao Huang (Hunan University, P.R. China)	
<i>Research on hybrid rotor PMSM with the mechanical flux-adjusting device</i>	2283
Hui Xu (Jiangxi University of Science and Technology, P.R. China), Xiping Liu (Jiangxi University of Science and Technology, P.R. China), JuanJuan Xiao (Jiangxi University of Science and Technology, P.R. China)	
<i>Low Carrier-wave Frequency Ratio Drive Control for SPMSM</i>	2287
Xing Zhang (Hefei University of Technology, P.R. China), Chengjun Xu (Hefei University of Technology, P.R. China), Haoyuan Li (Hefei University of Technology, P.R. China), Shanhong Liu (Hefei University of Technology, P.R. China), Siwei Yang (Hefei University of Technology, P.R. China)	
<i>Magnetic Equivalent Circuit Framework for an Axial Flux Permanent Magnet Synchronous Machine</i>	2293
Lun Jia (Southeast University, P.R. China), Mingyao Lin (Southeast University, P.R. China), Nian Li (Southeast University, P.R. China), Wei Le (Southeast University, P.R. China), Xikun Wu (Southeast University, P.R. China), Zehua Chen (Southeast University, P.R. China)	

<i>A Virtual Signal Injection Based MTPV Control for IPMSM</i> Xiahe Zhang (Zhejiang University, P.R. China), Jun Wang (Zhejiang University, P.R. China), Xiaoyan Huang (Zhejiang University, P.R. China) .....	2298
<i>Synchronous Filter Based Harmonic Suppression for PMSM in Overmodulation Region</i> Kan Liu (Hunan University, P.R. China), Bowen Wang (Hunan University, P.R. China), Yashan Hu (Hunan University, P.R. China) .....	2305
<i>Design and Performance Analysis of Cryogenic High-Speed Permanent Magnet Synchronous Motor</i> Lv Xinyuan (Harbin Institute of Technology, P.R. China), Lizhi Sun (Harbin Institute of Technology, P.R. China), Dongyang Sun (Harbin Institute of Technology, P.R. China) .....	2311
<i>Four-phase transverse flux permanent magnet motor control system with AC current control based on PR regulator</i> Jiaxin Chen (Nanjing University of Aeronautics and Astronautics, P.R. China), Zhihui Chen (Nanjing University of Aeronautics & Astronautics, P.R. China), Jinjin Duan (Nanjing University of Aeronautics and Astronautics, P.R. China), Changjin Zhang (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	2317
<i>Dual Model Predictive Torque Control (Dual-MPC) of PMSM Based on Generalized Double Vectors</i> Qixiang Wang (Shanghai Jiao Tong University, P.R. China), Li Zhu (Shanghai Jiao Tong University, P.R. China), Xiang Luo (Shanghai Jiao Tong University, P.R. China), Lingling Yuan (PDStars Electric Co., Ltd, P.R. China) .....	2323
<i>Design Optimizations of Advanced Interior Permanent-magnet Motors for Small-horsepower Refrigerant Compressor Applications</i> Cheng-Tsung Liu (National Sun Yat-Sen University, Taiwan), Kuan Yang (National Sun Yat-Sen University, Taiwan), Yu-Hsien Chen (National Sun Yat-Sen University, Taiwan), Ming-Tsung Chiu (NEW WIDETECH, Taiwan), Jui-An Chiang (NEW WIDETECH, Taiwan), Chung-Ming Lin (NEW WIDETECH, Taiwan) .....	2327
<i>Analytical Methods for Optimal Rotor Step-Skewing To Minimize Cogging Torque in Permanent Magnet Motors</i> Shao Nian (Shanghai Jiao Tong University, P.R. China), Li Zhu (Shanghai Jiao Tong University, P.R. China), Xiang Luo (Shanghai Jiao Tong University, P.R. China), Zhifang Huang (PDStars Electric Co., Ltd, P.R. China) .....	2333
<i>Derivative Speed Feedback Scheme for Improved Speed Control of Interior Permanent Magnet Synchronous Machine at overmodulation Region</i> Fang Sheng (Zhejiang University, P.R. China), Jun Wang (Zhejiang University, P.R. China), Xiaoyan Huang (Zhejiang University, P.R. China), Youtong Fang (Zhejiang University, P.R. China), Jian Zhang (Zhejiang University, P.R. China) .....	2338
<i>Optimal Efficiency Current Trajectory Control of Permanent Magnet Synchronous Motor Considering Cross Coupling and Magnetic Saturation</i> Ruzhao Mo (Hunan University, P.R. China), Jian Gao (Hunan University, P.R. China), Wenjuan Zhang (Changsha University, P.R. China), Shoudao Huang (Hunan University, P.R. China), Huimin Li (Hunan University, P.R. China) .....	2343

## Permanent Magnet Motors and Drives (AC)

<i>IPMSM with Rotor Using Two Different Cores</i> Yuji Kuroiwa (Meiji University, Japan) .....	2349
<i>Research on method for reducing eddy current loss of magnet in high-speed permanent magnet synchronous motor</i> Chen Chen (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Youlong Wang (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Hui Xu Wen (Institute of Electrical Engineering Chinese Academy of Sciences & Key Laboratory of Power Electronics and Electric Drive, P.R. China), Jialin Wei (Institute of Electrical Engineering of CAS & University of Chinese Academy of Sciences, P.R. China) .....	2353
<i>Analytical Method-Based Optimization Design of Wide High-Efficiency Area about Automotive Permanent Magnet Hub Motor</i> Xisheng Zeng (Shanghai University, P.R. China), Qi Zhang (Shanghai University, P.R. China), Surong Huang (Shanghai University, P.R. China), Tianao Yuan (Shanghai University, P.R. China), Ying Hongliang (School of Mechatronics Engineering and Automation, Shanghai University & Shanghai Edrive Co., Ltd, P.R. China) .....	2357
<i>Torque feedforward control based on sudden load change of dual PWM permanent magnet electric drive system</i> Wang Zhou (Hunan University, P.R. China), Jian Gao (Hunan University, P.R. China), Wenjuan Zhang (Changsha University, P.R. China), Shoudao Huang (Hunan University, P.R. China), Rui Li (Hunan University, P.R. China) .....	2363
<i>Analysis of Temperature Field For Special Vehicle Drive Motor</i> Chengxu Li (Hunna University, P.R. China), Jian Gao (Hunan University, P.R. China), Wenjuan Zhang (Changsha University, P.R. China), Shoudao Huang (Hunan University, P.R. China), Jiajie Zhang (Hunna University, P.R. China) .....	2369
<i>Active Disturbances Rejection Controller for Position Servo Control of PMSM</i> Yongsheng Huang (Harbin Institute of Technology, P.R. China), Jiming Zhou (Harbin Institute of Technology (HIT), P.R. China), Minghui Wang (Harbin Institute of Technology, P.R. China), Yongxiang Xu (Harbin Institute of Technology (HIT), P.R. China), Jibin Zou (Harbin Institute of Technology, P.R. China) .....	2374

<i>Multi-objective shape optimization of Permanent Magnet Synchronous Motor based on Kriging surrogate model and design domain reduction</i>	
Jianwen Bao (Dalian University of Technology, P.R. China), Jian Xing (Dalian University of Technology, P.R. China), Yangjun Luo (Dalian University of Technology, P.R. China), Ping Zheng (Harbin Institute of Technology, P.R. China)	2378
<i>Carrier Frequency Harmonic Suppression in Dual Three-Phase Permanent Magnet Synchronous Motor System Based on Periodic Frequency Modulation</i>	
Boyuan Zheng (Harbin Institute of Technology, P.R. China), Yongxiang Xu (Harbin Institute of Technology (HIT), P.R. China), Guan Wang (Harbin Institute of Technology, P.R. China), Jibin Zou (Harbin Institute of Technology, P.R. China), Minghui Wang (Harbin Institute of Technology, P.R. China), Lijun Xiao (Harbin Institute of Technology, P.R. China)	2382
<i>Multi-objective optimization of the Permanent Magnet Synchronous Motor with special magnet pole</i>	
Dandan Wan (Hunan University, P.R. China), Qifeng Bian (State Grid Zhejiang Electric Power Co., LTD., P.R. China), Huali Xia (State Grid Zhejiang Electric Power Co., LTD., P.R. China), Xiao Liu (Hunan University, P.R. China), Shoudao Huang (Hunan University, P.R. China)	2387
<i>Research on the Combinations of Pole and Slot for Twelve-Phase Fractional-Slot Concentrated-Winding Permanent Magnet Motor</i>	
Bingnan Zhang (Harbin Institute of Technology, P.R. China), Bochao Du (Harbin Institute of Technology, P.R. China), Tianxu Zhao (Harbin Institute of Technology, P.R. China), Shumei Cui (Harbin Institute of Technology, P.R. China)	2393
<i>New method to suppress torque ripple of BLDCM based on Tapped-Inductor Quasi-Z-Source net</i>	
Hui Wang (Changsha University of Science and Technology, P.R. China), Lawu Zhou (Changsha University of Science and Technology, P.R. China), Feilong Li (Changsha University of Science and Technology, P.R. China), Hao Guo (Changsha University of Science and Technology, P.R. China), Ling Li (Changsha University of Science and Technology, P.R. China), Yu Liang (Changsha University of Science and Technology, P.R. China)	2399
<i>Determination of Iron Loss Coefficients of Ferromagnetic Materials Used in Cryogenic Motors</i>	
Lv Xinyuan (Harbin Institute of Technology, P.R. China), Lizhi Sun (Harbin Institute of Technology, P.R. China), Dongyang Sun (Harbin Institute of Technology, P.R. China)	2405
<i>A Dual-plane SVPWM Strategy for Dual Three-phase PMSM</i>	
Changpan Zhou (Xi'an University of Technology, P.R. China), Tan Liu (Xi'an University of Technology, P.R. China), Xiangdong Sun (Xi'an University of Technology, P.R. China), Guijie Yang (Harbin Institute of Technology (HIT), P.R. China), Jianyong Su (Harbin Institute of Technology (HIT), P.R. China)	2410
<i>Multi-Objective Optimization of an Air-Cored Axial Flux Permanent Magnet Synchronous Machine with Segmented PMs based on Support Vector Machine and Genetic Algorithm</i>	
Wei Le (Southeast University, P.R. China), Mingyao Lin (Southeast University, P.R. China), Lun Jia (Southeast University, P.R. China), Jian Ai (Southeast University, P.R. China), Xinghe Fu (Southeast University, P.R. China), Zehua Chen (Southeast University, P.R. China)	2416
<i>Research on Demagnetization Mechanism and Test Method of Ferrite Permanent Magnet Assisted Synchronous Reluctance Motor</i>	
Zhu Xiaoguang (State Key Laboratory of Air-conditioning Equipment and System Energy Conservation, P.R. China)	2420
<i>The Research on Temperature Effect for Dynamic Performance of High-Speed Permanent-Magnet Synchronous Machines Rotors</i>	
Xiaoyuan Wang (Tianjin University, unknown), Yuxi Gu (School of Electrical and Information Engineering, Tianjin University, P.R. China), Peng Gao (Tianjin University, P.R. China), Xiaoning Li (Tianjin University, unknown)	2424
<i>Direct Torque Control for Three-Phase Open-End Winding Permanent Magnet Synchronous Motor Based on Zero-Sequence Current Suppression</i>	
Xiaogang Lin (Nanjing University of Aeronautics and Astronautics, P.R. China), Wenxin Huang (Nanjing University of Aeronautics and Astronautics, P.R. China), Wen Jiang (Nanjing University of Aeronautics and Astronautics, P.R. China)	2430

## Permanent Magnet Motors and Drives (AD)

<i>Fuzzy Sliding Mode Control of Permanent Magnet Synchronous Motor Based on the Integral Sliding Mode Surface</i>	
Longfei Jia (Beijing Research Institute of Precise Mechatronics and Controls, P.R. China), Yuping Huang (Beijing Research Institute of Precise Mechatronic Controls, P.R. China), Jigui Zheng (Beijing Research Institute of Precise Mechatronic Controls, P.R. China), Jing Chen (Beijing Research Institute of Precise Mechatronic Controls, P.R. China), Yunfei Tao (Beijing Research Institute of Precise Mechatronics and Controls, P.R. China), Pengfei Li (Beijing Research Institute of Precise Mechatronics and Controls, P.R. China)	2436

<i>Design and Optimization of an Outer-Rotor SPMSM with Permanent Magnets of Reverse Step Shape</i>	
Jiaxin Zhao (South China University of Technology, P.R. China), Shiwei Zhao (South China University Of Technology, P.R. China), Huajie Yin (South China University of Technology, P.R. China), Xiangyu Yang (South China University of Technology, P.R. China), Jianghua Cao (South China University of Technology, P.R. China), Guanbao Zeng (South China University of Technology & School of Electric Power, P.R. China)	2442
<i>Current Boundary Based Model Predictive torque control of PMSM</i>	
Chenwei Ma (Harbin Engineering University & Ghent University, Belgium), Xuliang Yao (Harbin Engineering University, P.R. China), Huayu Li (Ghent University, unknown), Frederik De Belie (Ghent University, Belgium)	2447
<i>A Novel Preliminary Design Method of PMSM Drive System for Minimizing Acceleration Time of High-Speed and Large-Inertia Flywheel Rotor Load</i>	
Jiakang Yao (Huazhong University of Science and Technology & State Key Laboratory of Advanced Electromagnetic Engineering and Technology, P.R. China), Yu Kexun (Huazhong University of Science and Technology, P.R. China), Xianfei Xie (Huazhong University of Science and Technology, P.R. China), Lizheng Li (Huazhong University of Science and Technology, P.R. China)	2453
<i>Analysis and Suppression of Electromagnetic Ripple Torque of Surface-Mounted Permanent Magnet Synchronous Motor with Similar Number of Poles and Slots</i>	
Xiangdong Liu (Beijing Institute of Technology, P.R. China), Yuan He (Beijing Institute of Technology, P.R. China), Quansong Mou (Beijing Institute Of Technology, P.R. China), Jing Zhao (Beijing Institute Of Technology, P.R. China)	2461
<i>Thermal Analysis of Asymmetric Winding Multiphase Motor</i>	
Tianxu Zhao (Harbin Institute of Technology, P.R. China), Bochao Du (Harbin Institute of Technology, P.R. China), Kuang Zhi (Harbin Institute of Technology, P.R. China), Shumei Cui (Harbin Institute of Technology, P.R. China)	2468
<i>A Motor Controller Development Framework Based on Switch Model Simulation and All Code Automatic Generation</i>	
Kang Liu (Huazhong University of Science and Technology, P.R. China), Dong Jiang (Huazhong University of Science and Technology, P.R. China), Sun Wei (Huazhong University of Science and Technology, P.R. China), Zicheng Liu (Huazhong University of Science and Technology, P.R. China)	2474
<i>Stability Analysis of Explicit Model Prediction Method under Vector Control of Permanent Magnet Synchronous Motor</i>	
Han Wang (Harbin Institute of Technology, P.R. China), Jianyong Su (Harbin Institute of Technology (HIT), P.R. China), Guijie Yang (Harbin Institute of Technology (HIT), P.R. China)	2479
<i>Analysis and Suppression of Vibration in Modular Fault-Tolerant PMSM Under Single-Phase Short-Circuit Faults</i>	
Shibo Li (Harbin Insititute of Technology, P.R. China), Lei Chen (Harbin Institute of Technology, P.R. China), Zaixin Song (City University of Hong Kong, Hong Kong), Feng Chai (Harbin Institute of Technology, P.R. China), Yue Tang (Harbin Institute of Technology, P.R. China), Guangxian Han (Shanghai AMP MOONS' Automation CO., LTD, P.R. China)	2485
<i>Design and Comparison of Two Hybrid Less-Rare-Earth Permanent Magnet Machines with Different Rotor Topologies</i>	
Yifeng Hua (Jiangsu University, P.R. China), Li Quan (Jiangsu University, P.R. China), Xiaoyong Zhu (Jiangsu University & School of Electrical and Information Engineering, P.R. China), Lei Xu (Jiangsu University, P.R. China), Zixuan Xiang (Jiangsu University, P.R. China), Weiling Pu (Jiangsu University, P.R. China)	2491
<i>Online Identification of Flux Linkage Based on FPGA for Permanent Magnet Synchronous Motor Current Decouple Control</i>	
Jin Gao (Shanghai University, P.R. China), Jing Wang (Shanghai University, P.R. China), Ning Wang (Shanghai University, P.R. China), Pengfei Zhan (Shanghai University, P.R. China), Siyu Wang (Shanghai University, P.R. China)	2496
<i>Iron Loss and Thermal Analysis of High Speed PM motor Using Soft Magnetic Composite Material</i>	
X. Wang (Hubei University of Technology, P.R. China), S. Zhou (Hubei University of Technology, P.R. China), L. Wu (Hubei University of Technology, P.R. China), C. Hu (Hubei University of Technology, P.R. China), M. Zhao (Hubei University of Technology, P.R. China)	2501
<i>Design of multi-layer PCB coreless axial permanent magnet synchronous motor</i>	
X. Wang (Hubei University of Technology, P.R. China), C. Hu (Hubei University of Technology, P.R. China), M. Zhao (Hubei University of Technology, P.R. China), L. Wu (Hubei University of Technology, P.R. China), S. Zhou (Hubei University of Technology, P.R. China)	2505
<i>Optimization Design of In-wheel Motor Based on Halbach (Ce,Nd)FeB Magnet</i>	
X. Wang (Hubei University of Technology, P.R. China), L. Wu (Hubei University of Technology, P.R. China), S. Zhou (Hubei University of Technology, P.R. China), C. Hu (Hubei University of Technology, P.R. China), M. Zhao (Hubei University of Technology, P.R. China)	2509
<i>Comparative Study of Interior Permanent Magnet Machine with Conventional and Consequent Pole Rotor</i>	
Lin Zhang (Nanjing University of Aeronautics and Astronautics, P.R. China), Kai Wang (Nanjing University of Aeronautics and Astronautics, P.R. China)	2513

<i>Torque Optimization of a Seven-Phase Bi-harmonic PMSM in Healthy and Degraded Mode</i>	
Hao Zhang (Shandong University, School of Electrical Engineering, P.R. China), Benteng Zhao (Shandong University, School of Electrical Engineering, P.R. China), Jinlin Gong (Shandong University, School of Electrical Engineering, P.R. China), Yanliang Xu (Shandong University, P.R. China), Duc Tan Vu (Arts et Metiers ParisTech, France), Ngac Ky Nguyen (Laboratory of Electrical Engineering and Power Electronics of Lille (L2EP), France), Eric Semail (Laboratory of Electrical Engineering and Power Electronics of Lille (L2EP), France), Tiago Jose dos Santos Moraes (Laboratory of Electrical Engineering and Power Electronics of Lille (L2EP), France)	2518
<i>Electromagnetic Performance Prediction of a Double-Rotor Flux-Switching Motor Based on General Air-Gap Equivalent Algorithms Model</i>	
Jiqi Wu (Jiangsu University & School of Electrical and Information Engineering, P.R. China), Xiaoyong Zhu (Jiangsu University & School of Electrical and Information Engineering, P.R. China), Zixuan Xiang (Jiangsu University, P.R. China), Lei Xu (Jiangsu University, P.R. China), Min Jiang (Jiangsu University, P.R. China), Weiling Pu (Jiangsu University, P.R. China)	2524

## Permanent Magnet Motors and Drives (AE)

<i>Online Parameter Identification Based on MTPA Operation for IPMSM</i>	
Yunliu Xu (Huazhong University of Science and Technology, P.R. China), Xing Wang (Huazhong University of Science and Technology, P.R. China), Kai Yang (Huazhong University of Science and Technology, P.R. China), Feng Jiang (Huazhong University of Science and Technology, P.R. China), Anming Liu (Huazhong University of Science and Technology, unknown)	2530
<i>Mechanical Parameter Identification of Permanent Magnet Synchronous Motor Based on High-Order Fast Terminal Sliding Mode Disturbance Observer</i>	
Ge Liang (Hunan University, P.R. China), Shoudao Huang (Hunan University, P.R. China), Mengdi Li (Hunan University & College of Electrical and Information Engineering, P.R. China)	2534
<i>Analysis and Suppression of DC Bus Voltage Ripple of Cascade Brushless DC Motor Drive System</i>	
Z Hang (Nanjing University of Aeronautics and Astronautics, P.R. China)	2540
<i>Comparative Analysis of Electromagnetic Force Inverter Fed PMSM Drive Using Field Oriented Control (FOC) and Direct Torque Control (DTC)</i>	
Chao Zhang (Shandong University, P.R. China), Xiuhe Wang (Shandong University, P.R. China), Daohan Wang (Shandong University, P.R. China), Qingsen Sun (Shandong Taian Power Supply Company, P.R. China), Guanqun Ma (Shandong University, P.R. China)	2545
<i>Current Harmonics of PMSMs Fed by Three-level NPC H-bridge Inverters: Characteristics Analysis and Influence on Machine Internal Magnetic Fields</i>	
Zhongkun Ji (National Key Laboratory of Science and Technology on Vessel Integrated Power System, P.R. China), Siwei Cheng (National Key Laboratory of Science and Technology on Vessel IPS, P.R. China), Dong Wang (Institute of Power Electronics Technology, NUE, P.R. China)	2549
<i>A Disturbance-Observer-Based Current Control Scheme for Five-Phase PMSM Drives with Multiple Sources of Disturbance</i>	
Cong Xiong (University of Chinese Academy of Sciences & Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Yihong Qin (University of Chinese Academy of Sciences, P.R. China), Peng Zhou (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Haiping Xu (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China)	2555
<i>Optimization of Cogging Torque in A Hybrid Axial and Radial Flux Permanent Magnet Machine</i>	
Songjun Sun (Huazhong University of Science and Technology, P.R. China), Feng Jiang (Huazhong University of Science and Technology, P.R. China), Tianle Li (Huazhong University of Science and Technology, P.R. China), Kai Yang (Huazhong University of Science and Technology, P.R. China)	2561
<i>Proportional Resonant-Based Active Disturbance Rejection Control for Speed Fluctuation Suppression of PMSM Drives</i>	
Minghe Tian (Harbin Institute of Technology, P.R. China), Bo Wang (Harbin Institute of Technology, P.R. China), Yong Yu (Harbin Institute of Technology (HIT), P.R. China), Xing Ma (Harbin Institute of Technology, P.R. China), Qinghua Dong (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China)	2566
<i>Maximum Efficiency Per Nm Control for Permanent Magnet Synchronous Motor Drives Based on Geometric Tangent Method</i>	
Lizheng Li (Huazhong University of Science and Technology, P.R. China), Yu Kexun (Huazhong University of Science and Technology, P.R. China), Xianfei Xie (Huazhong University of Science and Technology, P.R. China)	2572
<i>Analysis of a Novel Transverse-flux Machine with Dual-tooth-slot Core Configuration for Direct-drive Applications</i>	
Xiaobao Yang (Harbin Institute of Technology, P.R. China), Baoquan Kou (Harbin Institute of Technology, P.R. China), Jun Luo (Harbin Institute of Technology, P.R. China), He Zhang (Harbin Institute of Technology, P.R. China), Yi Shao (Harbin Institute of Technology, P.R. China)	2578

<i>ADRC-Based Speed Control for Permanent Magnet Synchronous Machine Drives Using Sliding-Mode Extended State Observer</i>	
Chengwei Kang (CRRC CHANGCHUN RAILWAY VEHICLES CO. LTD., P.R. China), Cong Peicheng (CRRC CHANGCHUN RAILWAY VEHICLES CO. LTD., P.R. China), Yanzhen Shao (Harbin Institute of Technology, P.R. China), Bo Wang (Harbin Institute of Technology, P.R. China)	2582
<i>On-line Estimation of Permanent-magnet Flux and Temperature Rise in Stator Winding for PMSM</i>	
Yifan Min (Nanjing University of Aeronautics and Astronautics, P.R. China), Wenxin Huang (Nanjing University of Aeronautics and Astronautics, P.R. China), Jufeng Yang (Jiangsu University, P.R. China), Yong Zhao (Nanjing University of Aeronautics and Astronautics, P.R. China)	2586
<i>Magnetic Circuit Model and Performance Analysis of a V-Type Hybrid Permanent-Magnet Variable-Flux Machine</i>	
Shukuan Zhang (Harbin Institute of Technology, P.R. China), Mingqiao Wang (Harbin Institute of Technology, P.R. China), Faliang Liu (Harbin Institute of Technology, P.R. China), Guangyuan Qiao (Harbin Institute of Technology, P.R. China), Xiaoning Ma (State Grid Liaoning Electric Power co. LTD, P.R. China), Ping Zheng (Harbin Institute of Technology, P.R. China)	2591
<i>Comparisons of Concentrated Fractional Winding and Distributed Winding of Permanent Magnet Synchronous Motors for Biped Robot</i>	
Yuting Xu (Zhejiang University, P.R. China), Xiaoyan Huang (Zhejiang University, P.R. China), Zhuo Chen (Zhejiang University, P.R. China), Jian Zhang (Zhejiang University, P.R. China)	2596
<i>Key Technology of High Overload High Speed Permanent-Magnet Synchronous Motor</i>	
Guangwei Xu (Harbin Institute of Technology, P.R. China), Jiwei Cao (Harbin Institute of Technology, P.R. China), Yuchen Song (Harbin Institute of Technology, P.R. China), Yuqing Liu (Harbin Institute of Technology, P.R. China), Liyi Li (Harbin Institute of Technology, P.R. China)	2600
<i>Evaluation of the Harmonics in Permanent-Magnet Synchronous Traction Motor with Low Switching Frequency Power Supply</i>	
Zhuo Chen (Zhejiang University, P.R. China), Xiaoyan Huang (Zhejiang University, P.R. China), Yuting Xu (Zhejiang University, P.R. China), Jian Zhang (Zhejiang University, P.R. China)	2605
<i>Design and Research of Modular Multiphase Permanent Magnet Direct Drive Generator</i>	
Junqiang Xing (Shenyang Institute Of Engineering, P.R. China)	2609

## Permanent Magnet Motors and Drives (AF)

<i>Stator Flux Trajectory control combined with Optimized Pulse Patterns for Interior Permanent Magnet Machines</i>	
Nina Hartgenbusch (Rheinisch Westfälische Technische Hochschule Aachen, Germany), Iliya Ralev (Rheinisch Westfälische Technische Hochschule Aachen, Germany), Tetsuya Kojima (Mitsubishi Electric Corporation, Germany), Rik De Doncker (RWTH Aachen University & Institute for Power Generation and Storage Systems, Germany)	2613
<i>A Current Optimization Strategy for Torque Ripple Reduction of Brushless DC Motor with Nonideal Back Electromotive Force</i>	
Guidan Li (Tianjin University, P.R. China), Jiaqi Wang (Tianjin University, P.R. China), Bin Li (Tianjin University, P.R. China), Tianqi Zhang (Tianjin University, P.R. China)	2619
<i>Quantitative Comparison of Two Typical Field-Modulated Permanent Magnet Machines: Unidirectional Field Modulation Effect versus Bi-directional Field Modulation Effect</i>	
Linni Jian (Southern University of Science and Technology, P.R. China), Yujun Shi (Southern University of Science and Technology, P.R. China), Tze Wood Ching (University of Macau, Macao & University of Hong Kong, Hong Kong)	2625
<i>Research on Bearing Current Detection Method of High-speed Motor Driven by PWM Inverter</i>	
Yuqing Liu (Harbin Institute of Technology, P.R. China), Jiwei Cao (Harbin Institute of Technology, P.R. China), Yuchen Song (Harbin Institute of Technology, P.R. China), Guangwei Xu (Harbin Institute of Technology, P.R. China), Liyi Li (Harbin Institute of Technology, P.R. China)	2631
<i>Analysis of Influence of Frequency on Torque Ripple Based on High-Speed BLDC Drive System with SiC-MOSFET</i>	
Yiting HU (Shanghai Dianji University, P.R. China)	2637
<i>Research on the Method of Reducing Cogging Force of Vernier Motor</i>	
Ying Xie (Harbin University of Science and Technology, P.R. China), Cheng Pi (Harbin University of Science and Technology, P.R. China), Zhaoyang Ning (Harbin University of Science and Technology, P.R. China)	2643
<i>Design and Research of a Novel Five-Phase Fault-Tolerant Vernier Motor with Permanent Magnets on Both Side of Rotor</i>	
Ying Xie (Harbin University of Science and Technology, P.R. China), Yu Xia (Harbin University of Science and Technology, P.R. China), Pan Mao (Harbin University of Science and Technology, P.R. China)	2648



<i>Design and Research of Low-Speed High-Torque Permanent Magnet Synchronous Motor With Outer Rotor</i> Ying Xie (Harbin University of Science and Technology, P.R. China), Lin Fu (Harbin University of Science and Technology & College of Electrical and Electronic Engineering, P.R. China), Zexin Ma (Harbin University of Science and Technology, P.R. China) .....	2653
<i>A Permanent Magnet Flux Linkage Estimation Method Based on Luenberger Observer for Permanent Magnet Synchronous Motor</i> Jidong Lai (Hefei University of Technology, P.R. China), Chenguang Zhou (Hefei University of Technology, P.R. China), JianHui Su (Hefei University of Technology, P.R. China), Mingrui Xie (Hefei University of Technology, P.R. China), JiaLiang Liu (Hefei University of Technology, P.R. China), Tianyue Xie (Hefei University of Technology, P.R. China) .....	2658
<i>A Novel Sliding Mode Observer-based Sensorless PMSM Control</i> Hang Wu (Zhejiang University, P.R. China), Jianhua Wu (Zhejiang University, P.R. China), Qingguo Sun (Zhejiang University, P.R. China), Hongyu Wang (Zhejiang University, P.R. China), Le Zhang (Zhejiang Founder Motor Limited Company, P.R. China) .....	2664
<i>Optimization of IPMSM Barrier Shape Based on Neural Network</i> JuKyung Cha (Sungkyunkwan university, Korea), Sung-Bae Jun (Sungkunkwan University, unknown), Yong-Jae Kim (Chosun University, Korea), Sang-Yong Jung (Sungkyunkwan University, Korea) .....	2669
<i>Research on the accuracy of measuring the permanent magnet servo motor performance by power factor</i> Cunxiang Yang (Zhengzhou University of Light Industry, P.R. China), Hangyu Shen (Zhengzhou University of Light Industry & School of Electrical and Information Engineering, P.R. China), Hongbo Qiu (Zhengzhou University of Light Industry, P.R. China), Ran Yi (Zhengzhou University of Light Industry, P.R. China) .....	2673
<i>Research on electromagnetic force for a self-adaptive passive flux-weakening PMSM</i> Yu Wang (Heilongjiang University, P.R. China), Chunyan Li (Mechanical and Electrical Engineering, Heilongjiang University, P.R. China), Tao Meng (Mechanical and Electrical Engineering, Heilongjiang University, P.R. China) .....	2679
<i>Analysis on Harmonic Shaping Pole of Surface Mounted Permanent Magnet Machine</i> Chengtong Hu (Qingdao University, P.R. China), Xinzhen Wu (Qingdao University, P.R. China) .....	2684
<i>Electromagnetic-Thermal Timesaving Coupling Analysis of a Water Cooling IPM Machine for Accurate Prediction Performance</i> Chengsi Liu (Harbin Institute of Technology, P.R. China), Guodong Yu (Harbin Institute of Technology, unknown), Yongxiang Xu (Harbin Institute of Technology (HIT), P.R. China), Jibin Zou (Harbin Institute of Technology, P.R. China), Lijun Xiao (Harbin Institute of Technology, P.R. China) .....	2688
<i>Adaptive Observer Enhanced with Low-Frequency Signal Injection for Sensorless Control of PMSM</i> Tianxiao He (Nanjing University of Aeronautics & Astronautics, P.R. China), Jianbo Chu (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	2693
<i>Sensorless Control of Permanent Magnet Synchronous Motor with Optimized Performance at Low Speed</i> Yueming Zhang (Nanjing University of Aeronautics & Astronautics, P.R. China), Jianbo Chu (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	2698

## Permanent Magnet Motors and Drives (AG)

<i>Improvement of ferromagnetic bridge structure for axial-radial flux type fully superconducting synchronous motor</i> Hongbo Qiu (Zhengzhou University of Light Industry, P.R. China), Shubo Zhang (Zhengzhou University of Light Industry, P.R. China), Weili Li (Beijing Jiaotong University, P.R. China), Cunxiang Yang (Zhengzhou University of Light Industry, P.R. China) .....	2703
<i>Door Control System of Brushless DC Motor for Rail Transit Vehicle Using an Improved Flexible Motion Curve</i> Chuanhu Li (Nanjing University of Aeronautics and Astronautics, P.R. China), Dongqing Jiang (Nanjing University of Aeronautics and Astronautics, P.R. China), Junyue Yu (Nanjing University of Aeronautics and Astronautics, P.R. China), Chuang Liu (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	2709
<i>Design of Electromagnetic Anti-galloping Device for application of High Voltage Transmission Lines</i> Chengyan Zhang (Harbin Institute of Technology, P.R. China), MengYao Wang (Harbin Institute of Technology, P.R. China), Xu Jian (Harbin Electric Power Design Institute, P.R. China), Hang Zhao (Department of Operation and Maintenance & State Grid Harbin Electric Power Supply Company, P.R. China), Meng Xu (CPEE Power Supply Company, P.R. China) .....	2714

<i>Comparison of Control Performances by Using Different Waveform Generators for Electrolytic Capacitor-less Motor Drives</i>	
Junya Huo (Harbin Institute of Technology & Guangdong Midea Air-Conditioning Equipment CO., LTD, P.R. China), Hanlin Zhan (Guangdong Midea Air-Conditioning Equipment CO., LTD, P.R. China), Gaolin Wang (Harbin Institute of Technology (HIT) & School of Electrical Engineering and Automation, P.R. China), Nannan Zhao (Harbin Institute of Technology, P.R. China), Lianghong Zhu (Harbin Institute of Technology & Guangdong Midea Air-Conditioning Equipment CO., LTD, P.R. China, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China)	2719
<i>Presentation of a Double-Stator Axial-Flux Permanent-Magnet Disk Motor With Soft Magnetic Composite Cores and Its Cogging Torque Reduction</i>	
Shunhang Wei (Shandong University, P.R. China), Yanliang Xu (Shandong University, P.R. China)	2725
<i>Performance Improvement for PMSM Drives with Internal Model Based State Feedback Control Strategy</i>	
Lianghong Zhu (Harbin Institute of Technology & Guangdong Midea Air-Conditioning Equipment CO., LTD, P.R. China, P.R. China), Bin Hu (Guangdong Midea Air-Conditioning Equipment CO., LTD, P.R. China), Gaolin Wang (Harbin Institute of Technology (HIT) & School of Electrical Engineering and Automation, P.R. China), Nannan Zhao (Harbin Institute of Technology, P.R. China), Junya Huo (Harbin Institute of Technology & Guangdong Midea Air-Conditioning Equipment CO., LTD, P.R. China), Zhaoqiang Fu (Guangdong Midea Air-Conditioning Equipment CO., LTD, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China)	2729
<i>Electromagnetic Performances Analysis of a Hybrid-permanent-magnet Motor Capable of High Torque</i>	
Jiahong Zhuang (Yangzhou University, P.R. China), Yunyun Chen (Yangzhou University, P.R. China), Qianlong Wang (Yangzhou University, P.R. China), Weiling Pu (Jiangsu University, P.R. China)	2734
<i>Negative Sequence Current Suppression of Dual Three-Phase Permanent Magnet Synchronous Machines Considering Inductance Asymmetry</i>	
Liang Zhu (Zhejiang University, P.R. China), Lijian Wu (Zhejiang University, P.R. China), Jiaming Liu (Zhejiang University, P.R. China), Yuliang Guo (Zhejiang University, P.R. China)	2738
<i>A Novel PWM Modulation Based on Model Predictive Control for PMSM</i>	
YuSheng Hu (State Key Laboratory of Air-conditioning Equipment and System Energy Conservation, P.R. China), Weilin Guo (State Key Laboratory of Air-conditioning Equipment and System Energy Conservation, P.R. China), Anbo Yu (GREE, P.R. China), Li Yan (GreeElectric Appliances, Inc.of Zhuhai, unknown), Tongshi Zhang (GREE, P.R. China), Liyi Li (Harbin Institute of Technology (HIT), P.R. China)	2744
<i>Fast Search Theory based Online Model Predictive Control of Permanent Magnet Synchronous Motor</i>	
Bo Guan (Chongqing University, P.R. China), Xiong Du (Chongqing University, P.R. China)	2750
<i>Topology Optimization of an Interior PM Motor for Applying to Refrigerant Compressor</i>	
YuSheng Hu (State Key Laboratory of Air-conditioning Equipment and System Energy Conservation, P.R. China), Bin Chen (State Key Laboratory of Air-conditioning Equipment and System Energy Conservation, unknown), Yong Xiao (Electric Motor System Institute of GREE, P.R. China), Quanfeng Li (GREE, P.R. China), Liyi Li (Harbin Institute of Technology (HIT), P.R. China)	2756
<i>Integrated Starting/Generating System for UAVs Based on Outer Rotor Permanent Magnet Synchronous Machine</i>	
Shoujun Song (Northwestern Polytechnical University, P.R. China), Zhihui Zhang (Xi'an University, P.R. China), Wei Zhang (Xi'an University, P.R. China), Guozhu Li (Xi'an University, P.R. China), Di Li (Northwestern Polytechnical University, P.R. China)	2761
<i>Performance Analysis between Grain-oriented and Non-oriented Material on Yokeless And Segmented Armature Machine</i>	
YanJun Yu (Harbin Institute of Technology, P.R. China), Zichao Hao (Harbin Institute of Technology, P.R. China), Yunlong Bi (Harbin Institute of Technology, P.R. China), Yulong Pei (Harbin Institute of Technology (HIT), P.R. China)	2765
<i>Cogging Torque Reduction by Stepped Slot-Opening Shift for Interior Permanent Magnet Motors</i>	
Junchen Zhao (Huazhong University of Science and Technology, P.R. China), Jin Wang (Huazhong University of Science and Technology, P.R. China), Zhou Libing (Huazhong University of Science and Technology, P.R. China), Yiming Ma (Huazhong University of Science and Technology, P.R. China), Zhiwei Zhang (The Ohio State University, USA)	2770
<i>Design and Analysis of a Novel Line-Start Permanent-Magnet Synchronous Motor</i>	
Meng Si (State Grid Chongqing Electric Power Company Electric Power Research Institute, P.R. China), Xia Yu (State Grid Chongqing Electric Power Company Electric Power Research Institute, P.R. China), Bin Wu (State Grid Chongqing Electric Power Company, P.R. China)	2774
<i>Comparative Analysis of AC losses with round magnet wire and Litz Wire winding of a High - Speed PM Machine</i>	
Anuvav Bardalai (Key Laboratory of More Electric Aircraft Technology of Zhejiang Province, UNNC, United Kingdom (Great Britain) & University of Nottingham Ningbo China, P.R. China), Xiaochen Zhang (University of Nottingham, United Kingdom (Great Britain)), David Gerada (University of Nottingham, United Kingdom (Great Britain)), Chris Gerada (University of Nottingham, United Kingdom (Great Britain)), Tianjie Zou (University of Nottingham, United Kingdom (Great Britain)), Jing Li (University of Nottingham Ningbo China, P.R. China)	2778

<i>A New Rotor Cage Dedicated to the Starting Operation of the Flux Modulation Motors</i> Vincent Fedida (CAEMD Huazhong University of Science and Technology, P.R. China), Ronghai Qu (Huazhong University of Science and Technology, P.R. China) .....	2783
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------

## Permanent Magnet Motors and Drives (AH)

<i>On the Design of a Near-zero-speed Direct-driven Permanent Magnet Synchronous Torque Motor</i> Xueqiang Wang (Aerospace System EngineeringShanghai, SAST, P.R. China), Guiru Jing (Aerospace System EngineeringShanghai, SAST, P.R. China), Shiqiang Xu (Aerospace System EngineeringShanghai, SAST, P.R. China), Lizhi Sun (Harbin Institute of Technology, P.R. China), Lv Xinyuan (Harbin Institute of Technology, P.R. China) .....	2787
<i>Field Excitation Optimization in Hybrid Excited Switched Flux Permanent Magnet Machine for Maximum Output Power</i> Xu Liu (Hebei University of Technology, P.R. China), Ziwei Yuan (Hebei University of Technology, P.R. China), Shanhu Li (Hebei University of Technology, P.R. China), Zi Qiang Zhu (University of Sheffield, United Kingdom (Great Britain)) .....	2791
<i>A Novel Axial Flux Interior Permanent Magnet Motor with High Torque Density</i> Yunlong Bi (Harbin Institute of Technology, P.R. China), Yulong Pei (Harbin Institute of Technology (HIT), P.R. China), Feng Chai (Harbin Institute of Technology, P.R. China) .....	2797
<i>Split Ratio Optimization of Short-Time Duty PM Brushless DC Motors Considering Stator Winding Local Thermal Limitations</i> Quanwu Li (Northwest A&F University, P.R. China) .....	2802
<i>Rotor Position Compensation Method for PMSM based on Bus Current Precision Measurement</i> Kun Xia (University of Shanghai for Science and Technology, P.R. China), Yiwen An (University of Shanghai for Science and Technology, P.R. China) .....	2808
<i>Research on PMSM Position Sensorless Control Based on Improved Sliding Mode Observer</i> Zhen Yu Zhang (Harbin Institute of Technology(Shenzhen), P.R. China), Li Bao Zhang (Harbin Institute of Technology(Shenzhen), P.R. China), Hong Wang (Harbin Institute of Technology Shenzhen Graduate School, P.R. China) .....	2814
<i>Rotor Strength Analysis of Ultra-High Speed Permanent Magnet synchronous Motor</i> Yangyang Shao (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	2818
<i>Deadbeat Predictive Current Control for Permanent Magnet Synchronous Motor</i> Xu Xiaohui (Wuhan Institute of Marine Electric Propulsion, P.R. China), Zhongxiang He (Wuhan Institute of Marine Electric Propulsion, P.R. China), Hu Yu (Science and Technology on Ship Integrated Power System Technology Laboratory, P.R. China), Bo Chen (Xi'an University of Technology, P.R. China), Weizhang Song (Xi'an University of Technology, P.R. China) .....	2822
<i>Investigation of Multi-Physical Characteristics in Coupling-Five-Phase Motor under Driver-Open-Phase Fault Condition for Small Propulsion System</i> Phuong Thi Luu (Korea University of Science and Technology, Korea), Ji-Young Lee (Korea Electrotechnology Research Institute & University of Science and Technology, Korea), Yeonho Jeong (Korea Electrotechnology Research Institute, Korea), Ji-Won Kim (KERI & University of Science & Technology, Korea), Jiheon Lee (Korea Electrotechnology Research Institute, Korea), Kichang Lee (Korea Electrotechnology Research Institute, Korea) .....	2827
<i>Low-Speed Performance Improvement of Permanent Magnet Synchronous Motor Drive Based on Nonlinear Disturbance Torque Observer</i> Xueqiang Wang (Aerospace System EngineeringShanghai, SAST, P.R. China), Shiqiang Xu (Aerospace System EngineeringShanghai, SAST, P.R. China), Guiru Jing (Aerospace System EngineeringShanghai, SAST, P.R. China), Quntao An (Harbin Institute of Technology (HIT), P.R. China), Shuai Li (Harbin Institute of Technology, P.R. China), Lizhi Sun (Harbin Institute of Technology, P.R. China) .....	2831
<i>Sensor Fail-Safe of PMSM current control system by utilizing current and position state estimation techniques</i> Shota Hori (Nagoya University, Japan) .....	2836
<i>Design of a Hybrid Excited Permanent Magnet Machine with AC Field Winding Excitation</i> Liwen Liu (Hefei University of Technology, P.R. China), Hongmei Li (Hefei University of Technology, P.R. China), Zhiwen Chen (Hefei University of Technology, P.R. China), Tian Yu (Hefei University of Technology, P.R. China), Rundong Liu (Hefei University of Technology, P.R. China), Jingkui Mao (Hefei University of Technology, P.R. China) .....	2841
<i>Modeling and Analysis of Two-layer Dual-sided Permanent Magnet Linear Synchronous Motor</i> Yan Sun (Tongji University, P.R. China), Guo bin Lin (Tongji University, P.R. China), Zhixun Ma (Tongji University, P.R. China), Yuan zhe Zhao (Tongji University, P.R. China), Lin jie Ren (Tongji University, P.R. China), Siyuan Mu (Tongji University, P.R. China) .....	2845
<i>Research on Fractional Slot Permanent Magnet Synchronous Motors with Asymmetric Winding</i> Yong Li (Harbin Institute of Technology, P.R. China), Pengcheng MA (Harbin Institute of Technology, P.R. China), Baochao Wang (Harbin Institute of Technology, P.R. China) .....	2849

<i>Optimization of Electromagnetic Performance of Single Phase Line-Start Permanent Magnet Synchronous Motor Based on the Finite Element Method</i>	
Jing Shang (Harbin Institute of Technology, P.R. China), Wangang Tang (Harbin Institute of Technology, P.R. China), Cheng Liu (Harbin Institute of Technology, P.R. China) .....	2854
<i>Torque Performance Enhancement of PM-Type Vernier Motor Utilizing Saddle Coil and salient pole</i>	
Sungwoo Chang (University of Osaka, Japan) .....	2860
<i>Torque Ripple Suppression of Permanent Magnet Consequent-pole Machine by Magnet Shifting</i>	
Kai Wang (Nanjing University of Aeronautics and Astronautics, P.R. China), Guohao Zhang (Nanjing University of Aeronautics and Astronautics, P.R. China), Jian Li (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	2866

## Permanent Magnet Motors and Drives (AI)

<i>A Novel Bipolar Magnetic Field Crosslinking Transverse Flux Permanent Magnet Machine with High Torque Density</i>	
Jianhui Hu (Harbin Institute of Technology, P.R. China), Zihan Zhang (Harbin Institute of Technology, P.R. China), Guohui Duan (Harbin Institute of Technology, P.R. China), Cheng Liu (Harbin Institute of Technology, P.R. China) .....	2872
<i>Fault-Tolerant Current Control Strategy of Five-Phase Permanent Magnet Machine Based on Compensation in Third Harmonic Frame</i>	
Kai Wang (Nanjing University of Aeronautics and Astronautics, P.R. China), Jinwang Kong (Nanjing University of Aeronautics and Astronautics, P.R. China), Lufeng Zhang (Nanjing University of Aeronautics and Astronautics, P.R. China), Jianya Zhang (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	2878
<i>Modulated Model-free Predictive Control of PMSM Drive System</i>	
Yuchen Wang (Hefei University of Technology, P.R. China), Hongmei Li (Hefei University of Technology, P.R. China), Jingkui Mao (Hefei University of Technology, P.R. China), Jiandong Huang (Hefei University of Technology, P.R. China), Rundong Liu (Hefei University of Technology, P.R. China), Liwen Liu (Hefei University of Technology, P.R. China) .....	2883
<i>No-Load Iron Loss of a Surface-Mounted Permanent Magnet Synchronous Motor utilizing an Amorphous Metal Stator Core</i>	
Wenming Tong (Shenyang University of Technology, P.R. China), Ruolan Sun (Shenyang University of Technology, P.R. China), Shengnan Wu (Shenyang University of Technology, P.R. China) .....	2889
<i>Sensorless Control of Permanent Magnet Synchronous Motor Based on Extended State Observer</i>	
Baochao Wang (Harbin Institute of Technology (HIT), P.R. China), Cheng Liu (Harbin Institute of Technology, P.R. China), Jing Shang (Harbin Institute of Technology, P.R. China) .....	2894
<i>A Study of Third-harmonic Shaping in Surface-mounted Permanent Magnet Machine with Bread-shape Magnetic Pole</i>	
Pengfei Hu (Naval University of Engineering, P.R. China), Jin Shuanbao (Naval University of Engineering, P.R. China), Yingsan Wei (Naval University. of Engineering, P.R. China), Nan Lin (Naval University. of Engineering, P.R. China), Zhang Qinghu (Naval University of Engineering, P.R. China), Xingyu Wu (Naval University. of Engineering, P.R. China), Hao Zhu (Naval University. of Engineering, P.R. China), Fangxu Sun (Naval University of Engineering, P.R. China) .....	2899
<i>Slot-pole Combination Selection for Concentrated Wound Consequent Pole PMSM with Reduced EMF and Inductance Harmonics</i>	
Himavarsha Dhulipati (University of Windsor, Canada), Shruthi Mukundan (University of Windsor, Canada), Eshaan Ghosh (University of Windsor, Canada), Ze Li (University of Windsor, Canada), Buddhika De Silva Guruwatta Vidanalage (University of Windsor, Canada), Jimi Tjong (University of Windsor, Canada), Narayan Kar (University of Windsor, Canada), Wenlong Li (University of Windsor, unknown) .....	2904
<i>Improved Stator Current Vector Determination Considering Harmonic Iron Loss for Maximum Efficiency Control of PMSM in EV Applications</i>	
Aiswarya Balamurali (University of Windsor, Canada), Animesh Kundu (University of Windsor, Canada), Ze Li (University of Windsor, Canada), Narayan Kar (University of Windsor, Canada) .....	2910
<i>Efficiency Comparison of PAM-PWM Inverter with Partially Boost Converter for Motor Drive System</i>	
Ryutaro Ohyama (Tokyo University of Science, Japan), Nobukazu Hoshi (Tokyo University of Science & Faculty of Science & Technology, Japan) .....	2916
<i>A Novel Dual-Stator Permanent Magnet Vernier Machine with Enhanced Torque Density and Power Factor</i>	
Leilei Wu (Linyi University, P.R. China), Ronghai Qu (Huazhong University of Science and Technology, P.R. China) .....	2922
<i>Study on Magnetic Field Regulation of a Flux-Variable Partitioned Stator Permanent Magnet Claw-Pole Motor</i>	
Jianhui Hu (Harbin Institute of Technology, P.R. China), Yu Chen (Harbin Institute of Technology, P.R. China), Fangrui Wei (the University of Sheffield, P.R. China), Meng Zhao (Harbin Institute of Technology, P.R. China), Xiaoho Ran (Harbin Institute of Technology, P.R. China) .....	2927

<i>Optimal Design of Double Stator Permanent Magnet Motors Used in Electric Vehicle</i>	
Yong Zhao (Nanjing University of Aeronautics and Astronautics, P.R. China), Wenxin Huang (Nanjing University of Aeronautics and Astronautics, P.R. China), Wen Jiang (Nanjing University of Aeronautics and Astronautics, P.R. China), Xiaogang Lin (Nanjing University of Aeronautics and Astronautics, P.R. China), Dingfeng Dong (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	2932
<i>Off-line Stator Resistance Identification for PMSM with Pulse Signal Injection avoiding the Dead-time Effect</i>	
Xikun Wu (Southeast University, P.R. China), Mingyao Lin (Southeast University, P.R. China), Peng Wang (Southeast University, P.R. China), Lun Jia (Southeast University, P.R. China), Xinghe Fu (Southeast University, P.R. China) .....	2936
<i>Design and Optimization of a Permanent-Magnet-Assisted Synchronous Reluctance Motor with High Efficiency and Low Torque Ripple</i>	
Qifang Lin (The Hong Kong Polytechnic University, Hong Kong), Shuangxia Niu (The Hong Kong Polytechnic University, Hong Kong), Weinong Fu (The Hong Kong Polytechnic University, P.R. China) .....	2941
<i>Design and Analysis of a Novel Mechanical Variable Flux Stator Consequent-Pole PM Machine</i>	
Wei Liu (School of Electrical Engineering, Southeast University, P.R. China), Hui Yang (Southeast University, P.R. China), Heyun Lin (Southeast University, P.R. China) .....	2945
<i>Effect of non-uniform air gap on torque, electromagnetic force, mechanical stress and vibration</i>	
Pingping Dong (Zhejiang University, P.R. China), Xiaoyan Huang (Zhejiang University, P.R. China), Chenxi Zhou (Zhejiang University, P.R. China) .....	2951
<i>Effect of Additional Permanent Magnets in Spoke Structure Permanent Magnet Vernier Machine</i>	
Michihiro Houjo (Shibaura Institute of Technology, Japan), Shoji Shimomura (Shibaura Institute of Technology, Japan), Abdulaziz Gasim (Shibaura Institute of Technology, Japan) .....	2955

## Permanent Magnet Motors and Drives (AJ)

<i>Influences of 3D fluid field for submersible permanent magnet motors on thermal field distribution</i>	
Meng Zhao (Harbin Institute of Technology, P.R. China), Xiaohe Ran (Harbin Institute of Technology, P.R. China), Jing Shang (Harbin Institute of Technology, P.R. China) .....	2961
<i>Comparison of major PWM methods from the aspect of the system efficiency of machine drive system</i>	
Pengfei Wang (Suzhou Inovance Technology Company, P.R. China), Wenqiang Chu (Suzhou Inovance Technology Company, P.R. China), Taian Qi (Suzhou Inovance Technology Company, P.R. China) .....	2966
<i>Design of Digital Current Regulator for PMSM with Low Carrier Ratio</i>	
Anbo Yu (Yanshan University, P.R. China), Siqing Wang (Qinhuangdao of Hebei Province & Yanshan University, P.R. China), Chunjiang Zhang (Yanshan University, P.R. China), Chai Xiuhui (Yanshan University, P.R. China), Zhizhong Kan (Yanshan University, P.R. China) .....	2970
<i>Research on Regenerative Braking Torque Ripple Suppression of Brushless DC Motor</i>	
Chunyu Bian (School of the Information Science & Engineering, Northeastern University, P.R. China), Changwei Chen (School of the Information Science & Engineering, Northeastern University, P.R. China), Zhengqiang Zhang (School of the Information Science & Engineering, Northeastern University, P.R. China), Yongkui Man (School of the Information Science & Engineering, Northeastern University, P.R. China), Zixu Wu (School of the Information Science & Engineering, Northeastern University, P.R. China), Xiaoxia Li (School of the Information Science & Engineering, Northeastern University, P.R. China) .....	2977
<i>A Compact High Torque Density Dual Rotor Permanent Magnet In-Wheel Motor With Toroidal Windings</i>	
Zhiwei Zhang (The Ohio State University, USA) .....	2982
<i>Rare Earth-Free Dual Mechanical Port Machine with Spoke-Type PM Outer-Rotor for Electric Variable Transmission system</i>	
Zhiwei Zhang (The Ohio State University, USA), Changgeng Zhang (The Ohio State University, USA) .....	2987
<i>Robust Stator-Excited Brushless Synchronous Machine: An Attractive Permanent Magnet-Free Option</i>	
Zhiwei Zhang (The Ohio State University, USA) .....	2992
<i>Advanced Model Predictive Control Strategy in Optimization of Performance on Permanent Magnet Synchronous Machine</i>	
Qing Dang (Global Energy Interconnection Research Institute, SGCC, P.R. China), Jianliang Lu (Global Energy Interconnection Research Institute, SGCC, P.R. China) .....	2998
<i>Control Strategy for Start-Up Process of Micro Gas Turbine Generation Systems</i>	
Yang Zhan (NCEPU, P.R. China), Zhongqin Cai (Harbin Institute of Technology, P.R. China), Zhiyong Chen (North China Electric Power University, P.R. China), Qilei Bao (ENN Energy Power Technology (Shanghai) Co. Ltd, P.R. China), Chengli Zhang (Zhengzhou Power Supply Company State Grid of China, P.R. China), Mingji Liu (North China Electric Power University, P.R. China) .....	3004
<i>Calculation and Analysis of Cogging Torque and End Copper Loss of Fractional Slot Concentrated Winding PMSM</i>	
Chengtao Dang (Automation Research and Design Institution of Metallurgical Industry, P.R. China) .....	3008

<i>Comparison of Five-Phase and Three-Phase PMSMs with Identical Silicon Steel Laminations</i> Yi Sui (Harbin Institute of Technology, P.R. China), Zuosheng Yin (Harbin Institute of Technology, P.R. China), Luming Cheng (Harbin Institute of Technology, P.R. China), Jiaqi Liu (Harbin Institute of Technology, P.R. China), Ping Zheng (Harbin Institute of Technology, P.R. China) .....	3012
<i>Linear Quadratic Extended State Observer Based Load Torque Compensation for PMSM in a Single Rotor Compressor</i> Bin Hu (Guangdong Midea Air-Conditioning Equipment CO., LTD, P.R. China), Zhaobin Huang (Guangdong Midea Air-Conditioning Equipment CO., LTD, P.R. China) .....	3017
<i>Direct Torque Control of Hybrid Excitation Permanent Magnet Synchronous Motor</i> Yonghong Xia (Nanchang University, P.R. China), Xuanxing Yi (Nanchang University, unknown), Zijian Wen (Nanchang University & School of Information Engineering, P.R. China), Ying Chen (Nanchang University, P.R. China), Jingming Zhang (Nanchang University, P.R. China) .....	3021
<i>Analysis of Stiffness and Critical Speed of High Speed Permanent Magnet Motor Rotor System</i> Ruifeng Ma (Harbin University of Science and Technology, P.R. China) .....	3026
<i>Improved Deadbeat Control for PMSM with Terminal Sliding Mode Observer</i> Yunhui Wang (Shandong University, P.R. China), Ke Li (Shandong University, P.R. China), Xudong Liu (Qingdao University, P.R. China) .....	3031
<i>Design and Analysis of a New Less-rare-earth Permanent Magnet Motor with Axial Hybrid Rotors</i> Yunyun Chen (Yangzhou University, P.R. China), Jiahong Zhuang (Yangzhou University, P.R. China), Tongle Cai (Yangzhou University, P.R. China), Qianlong Wang (Yangzhou University, P.R. China), Weiling Pu (Jiangsu University, P.R. China) .....	3036
<i>Design of a Low Power Consumption Control System of Permanent Magnet Synchronous Motor for Automated Guided Vehicle</i> Zhikang Qian (Tongji University, P.R. China), Qiyi Guo (Tongji University, P.R. China), Minh-Trien Pham (VNU University of Engineering and Technology, Vietnam), Wei Li (Tongji University, P.R. China) .....	3040

## Transportation and Other Applications (PB)

<i>Energy Recovery Control Strategy of Motor with Supercapacitor</i> Biao Cao (Machinery Institute, University of Shanghai for Science and Technology, P.R. China), Chao Bi (University of Shanghai for Science and Technology & China, P.R. China), Zhen Peng (Machinery Institute, University of Shanghai for Science and Technology, P.R. China) .....	3045
<i>Seamless power supply strategies for a ship-controlled inverter system</i> Chunfang Zheng (Guangzhou Maritime University, P.R. China), Leming Xiao (Guangzhou Maritime University, P.R. China), Rui Li (Guangzhou Maritime University, P.R. China), Bo Zhang (South China University of Technology, P.R. China), Dong Yuan Qiu (South China University of Technology, P.R. China), Chen Yang (South China University of Technology, P.R. China) .....	3050
<i>Modelling and Analysis of an Aircraft On-board Electric Taxiing System</i> Milos Lukic (University of Nottingham, United Kingdom (Great Britain)), Paolo Giangrande (University of Nottingham, United Kingdom (Great Britain)), Christian Klumpner (The University of Nottingham, UK Campus, United Kingdom (Great Britain)), Michael Galea (University of Nottingham Ningbo China & University of Nottingham, P.R. China) .....	3054
<i>Electromagnetic Optimization of Propulsion Force of a Real-Scale Air Cored Superconducting Linear Motor Applied in EDS Train</i> Zhengwei Zhao (Southwest Jiaotong University, P.R. China), Shuai Xu (Southwest Jiaotong University, P.R. China), Kang Liu (Southwest Jiaotong University, P.R. China), Tianyong Gong (Southwest Jiaotong University, P.R. China), Jing Li (Southwest Jiaotong University, P.R. China), Guangtong Ma (Southwest Jiaotong University, P.R. China) .....	3060
<i>Control Strategy of Modularized Ultra-capacitor Energy Storage System for Regenerative Braking Energy in Metro- Transit Systems</i> Luhan Chen (Changsha, Hunan, P.R. China), Keyuan Huang (Hunan University, P.R. China), Wei Lv (Hunan University, P.R. China), Zhang Duanni (Hunan University, P.R. China), Shoudao Huang (Hunan University, P.R. China) .....	3065
<i>Graphene/Gold Based Photonic Crystal Fiber Plasmonic Temperature Sensor for Electric Vehicle Applications</i> Alok Kumar Paul (Rajshahi University of Engineering & Technology, Bangladesh), Md. Zahid Hassan (Varendra University, Bangladesh), Md. Rabiul Islam (University of Wollongong, Australia), Jian Guo Zhu (University of Sydney & University of Technology Sydney, Australia) .....	3070
<i>Voltage Balancing and High-efficiency Power Transmission Technologies for A Power Electronic Traction Transformer</i> Ruoyu Li (Southwest Jiaotong University, P.R. China), Hongjian Lin (Southwest Jiaotong University, P.R. China), Chunjian Cai (Southwest Jiaotong University, P.R. China), Leilei Zhu (Southwest Jiaotong University, P.R. China), Han Yan (Southwest Jiaotong University, P.R. China), Zeliang Shu (Southwest Jiaotong University, P.R. China) .....	3074

<i>Design and Analysis of a No-Insulation Pancake Coil-System for Next-Generation Meter-Class Bore High-Field MRIs</i> Tao Wang (Nanjing University of Science and Technology, P.R. China), Kaizhong Ding (Institute of Plasma Physics, Chinese Academy of Sciences, P.R. China), Shuangsong Du (Chinese Academy of Sciences, P.R. China), Chunlong Zou (Chinese Academy of Sciences, P.R. China) .....	3078
<i>A New Sort of Equalization Circuit Based on Coupled Inductor for Series-connected Battery Strings</i> Shaochen Wang (Harbin Institute of Technology, P.R. China), Shiyan Yang (Harbin Institute of Technology (HIT), P.R. China), Wei Yang (Harbin Institute of Technology, P.R. China) .....	3083

## Magnetic and Insulation Materials (MA)

<i>Experimental Study on Insulation Structure of Medium Voltage Freon Resistant Motor for Ship</i> Tao Yu (No. 704 Research Institute, P.R. China), Yu Liu (No. 704 Research Institute, P.R. China), Xin Jue Li (No. 704 Research Institute, P.R. China), Yang Zhang (No. 704 Research Institute, P.R. China) .....	3089
<i>Nonlinear Conduction Characteristics of Graphene Oxide Filled Epoxy Resin</i> Yongsen Han (Harbin University of Science and Technology, P.R. China), Xin Zhang (Harbin University of Science and Technology, P.R. China), Wenmin Guo (Harbin University of Science and Technology, P.R. China) .....	3093
<i>Experimental investigation of the relationship between magnetic properties of permanent magnet against temperature and pressure coupling environment</i> Lijun Xiao (Harbin Institute of Technology, P.R. China), Guodong Yu (Harbin Institute of Technology, unknown), Jibin Zou (Harbin Institute of Technology, P.R. China), Yongxiang Xu (Harbin Institute of Technology (HIT), P.R. China), Boyuan Zheng (Harbin Institute of Technology, P.R. China), Chengsi Liu (Harbin Institute of Technology, P.R. China) .....	3097
<i>Optimization of Two-Dimensional Rotational Single Sheet Tester</i> Yan Zhang (Hebei University of Science and Technology & Army Engineering University, P.R. China), Le Wang (Hebei University of Science and Technology, P.R. China), Jiang Zhao (Hebei University of Science and Technology, P.R. China), Youguang Guo (University of Technology Sydney, Australia), Zheng Li (Hebei University of Science and Technology, P.R. China), Jianrui Huang (Hebei University of Science and Technology, P.R. China) .....	3102
<i>The Effect of Processing Technologies on Magnetic Properties of Nanocrystalline Soft Magnetic Material</i> Yong Li (Harbin Institute of Technology, P.R. China), Quanhao Sun (Harbin Institute of Technology, P.R. China), Yongfei LI (Harbin Institute of Technology, P.R. China), Jiabin WU (Harbin Institute of Technology, P.R. China), Fei Liu (University of Harbin Institute of Technology, P.R. China) .....	3106

## Other Related Topics (QA)

<i>Decision Making of Flue Gas Desulphurization Technologies Based on Cloud Model and Grey Relation Projection Method</i> Zhongzhao Jing (State Grid Zhengzhou Power Supply Company, P.R. China), Fenglan Tian Tian (State Grid Zhengzhou Power Supply Company, P.R. China) .....	3111
<i>Calculation of the Copper Filling Factor of Electric Machines by Graphical Representation</i> Andreas Riedel (Friedrich-Alexander University Erlangen-Nuremberg, Germany), Alexander Roessert (Friedrich-Alexander University Erlangen-Nuremberg, Germany), Alexander Kuehl (Friedrich-Alexander University Erlangen-Nuremberg, Germany), Joerg Franke (FAPS, Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Germany) .....	3115
<i>Harmonic Filter Design Using Actual Recorded Data to Prevent Resonance in the Synchronous Generator for Biomass Power Plants</i> Chongrag Boonseng (King Mounkut Instituted of Technology Ladkrabang, Bangkok, THAILAND, Thailand), Kunyanuth Kularbphettong (Suan Sunandha Rajabhat University, Thailand), Rapeepornpat Boonseng (King Mongkut's Institute of Technology Ladkrabank, Bangkok, THAILAND, Thailand) .....	3121
<i>Multi-failure Admittance Sequence for Flow Transfer Problem of Electromagnetic Loop Network</i> Yi Yang (Harbin Institute of Technology, P.R. China), Zhizhong Guo (Harbin Institute of Technology, P.R. China), Yue Chen (Harbin Institute of Technology, P.R. China) .....	3126
<i>Probabilistic Connectivity Performance of Power Network Topology Variation Trajectory</i> Yi Yang (Harbin Institute of Technology, P.R. China), Zhizhong Guo (Harbin Institute of Technology, P.R. China), Yue Chen (Harbin Institute of Technology, P.R. China) .....	3132
<i>The Research of moving target statistic algorithm based on image processing</i> Dong Li (Wuhan City Vocational University, P.R. China), Xin Chen (Wuhan Business University, P.R. China) .....	3138

<i>Analysis and Design of High Power Density and Wide Output LCC Resonant Converter</i> Haifeng Liu (Shanghai University of Electric Power, P.R. China), Jinbin Zhao (Shanghai University of Electric Power, P.R. China), Yue Wang (Shanghai University of Electric Power, P.R. China), Keqing Qu (Shanghai University of Electric Power, P.R. China), Ling Mao (Shanghai University of Electric Power, P.R. China), Xiaoyang Wang (Shanghai University of Electric Power, P.R. China) .....	3142
<i>Review on reactive power compensation of electric vehicle charging piles</i> Aiguo Cai (Heilongjiang University of Science and Technology, P.R. China), Yannan Yu (Heilongjiang University of Science and Technology, P.R. China) .....	3148
<i>Wind Farm STATCOM Reactive Power Compensation Research Based on Model Predictive Control</i> Hongjun Chen (Harbin Institute of Technology, P.R. China), Rui Tang (Harbin Institute of Technology, P.R. China), Zhe Shi (Harbin Institute of Technology, P.R. China), Jiaming An (Harbin Institute of Technology, P.R. China) .....	3152
<i>The Design of a Low Distortion Power Amplifier Based on Cascode</i> Zhaokai Pan (Harbin Institute of Technology, P.R. China), Chunling Yang (Harbin Institute of Technology (HIT), P.R. China), Rongwei Feng (Beijing Orient Institute of Measurement and Test, P.R. China), Ming Qi (Harbin Institute of Technology, P.R. China), Qihong Luo (Xinjiang Xinxin Mining Industry, P.R. China), Min Zhu (Harbin Institute of Technology, P.R. China) .....	3157
<i>Flow Field Research of Electric Submersible Pump Based on Frozen Rotor Approximation</i> Tianle Li (Huazhong University of Science and Technology, P.R. China), Kai Yang (Huazhong University of Science and Technology, P.R. China), Anming Liu (Huazhong University of Science and Technology, unknown), Yunliu Xu (Huazhong University of Science and Technology, P.R. China), Songjun Sun (Huazhong University of Science and Technology, P.R. China) .....	3161
<i>Modulation recognition convolutional neural network based on FPGA</i> Xueyuan Liu (Harbin Institute of Technology, P.R. China), Jing Shang (Harbin Institute of Technology, P.R. China), Philip Leong (The University of Sydney, Australia), Cheng Liu (Harbin Institute of Technology, P.R. China) .....	3165
<i>The 3rd Harmonic Current and Power Quality Improvements of Data Centers Using Hybrid Power Filter</i> Kunyanuth Kularbphetpong (Suan Sunandha Rajabhat University, Thailand), Rapeepornpat Boonseng (King Mongkut's Institute of Technology Ladkrabank, Bangkok, THAILAND, Thailand), Chongrag Boonseng (King Mongkut Instituted of Technology Ladkrabang, Bangkok, THAILAND, Thailand) .....	3171
<i>Dynamics Analysis for 3-Node Power System with Power Disturbances</i> Fuhong Min (Nanjing Normal University, unknown), Yuan Cao (Nanjing Normal University, P.R. China), Guan Huang (Nanjing Normal University, P.R. China), Jing Zhu (Nanjing Normal University, P.R. China), Yiping Dou (Nanjing Normal University, P.R. China) .....	3175
<i>Rotor-dynamic Analysis for Magnetic Turbomolecular Pump Rotor with Different Assembly Relations</i> Yiming Zhang (Beihang University, P.R. China, P.R. China), Kun Wang (Beihang University, P.R. China), Zan He (Beihang University, P.R. China), Luxin Zhai (Beihang University, unknown) .....	3181
<i>Improvement of PRIME protocol based on Chaotic Cryptography</i> Pengfei Chen (Harbin Institute of Technology, P.R. China), Xiaosheng Liu (Harbin Institute of Technology, P.R. China), Jiarui Zhang (Harbin Institute of Technology, P.R. China), Chunjiao Yu (Harbin Institute of Technology, P.R. China), Honghong Pu (Harbin Insititute of Technology, P.R. China), Yousu Yao (Harbin Institute of Technology, P.R. China) .....	3186

## Other Related Topics (QB)

<i>Soil model establishment of UHVDC grounding electrode under complex geological conditions</i> Zhangao Ren (State Grid Hunan Electric Power Company Limited, unknown), Zhiqiang He (State Grid Hunan Electric Power Corporation Limited, P.R. China), Xin Li (State Grid Hunan Electric Power Corporation Limited Research Institute, P.R. China), Muxue Wang (China Three Gorges University, P.R. China), Xianqi Song (China Three Gorges University, P.R. China), Meng Yang (China Three Gorges University, P.R. China) .....	3191
<i>Sensorless Collision Detection for Robots Based on Load Torque Observer</i> Yuyang Song (Tsinghua University, P.R. China), Xi Xiao (Tsinghua University, P.R. China), Wenzhong Xu (Tsinghua University, P.R. China) .....	3197
<i>Study on SF<sub>6</sub>/N<sub>2</sub> gas mixture breakdown characteristics in the presence of a free metal particle</i> Zengyao Tian (Northwestern Polytechnical University, P.R. China), Hui Lin (Northwestern Polytechnical University, P.R. China), Hu Zhao (Northwestern Polytechnical University, P.R. China) .....	3202
<i>Spatially characteristics of an atmospheric-pressure surface dielectric barrier discharge plasma</i> Yunkun Deng (Postdoctoral Workstation of Yunnan Power Grid Corporation, P.R. China), Zengyao Tian (Northwestern Polytechnical University, P.R. China), Hu Zhao (Northwestern Polytechnical University, P.R. China) .....	3208
<i>Study on High Power Density Control Board of Permanent Magnet Synchronous Motor</i> Shaokun Zhang (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China) .....	3212



<i>Multi-mode Synchronized PWM Schemes for three-level NPC Inverter</i>	
Shengwen Fan (North China University of Technology, P.R. China), Yongji Yu (North China University of Technology, P.R. China), Yongchang Zhang (North China University of Technology, P.R. China), Haitao Yang (North China University of Technology, P.R. China)	3217
<i>Semi-physical Simulation Operation Monitoring System of Synchronous Generator Based on DSP and LabVIEW</i>	
Yu Jian (Harbin Institute of Technology, P.R. China), Shiyong Luo (School of Electrical Engineering & Automation, Harbin Institute of Technology, P.R. China), Qiang Gao (Harbin Institute of Technology (HIT), P.R. China)	3222
<i>A Fast Restart Hybrid MMC Topology with Fault Ride-through Ability</i>	
Kaidong Tan (North China Electric Power University, P.R. China), Yi Wang (North China Electric Power University, P.R. China), Mao Ji (North China Electric Power University, P.R. China)	3228
<i>Simulation Research of Magnetic Modulation Sensor Based on Permalloy Core</i>	
Yanqiu Shi (Shanghai Institute of Technology, P.R. China), Ping Qian (Shanghai Institute of Technology, P.R. China)	3233
<i>Convex Relaxation Conditions of Optimal Power Flow for Radial Microgrids</i>	
Guofeng Xia (Tsinghua University, P.R. China), Geng Yang (Tsinghua University, P.R. China), Hua Geng (Tsinghua University, P.R. China)	3238
<i>Intelligent Building System Optimal Scheduling Based on Residential Electricity Characteristic</i>	
Shuaihu Li (Xiangtan University, P.R. China), Yi He (Xiangtan University, P.R. China), Yuxi Zhou (Xiangtan University, P.R. China), Hanmei Peng (Xiangtan University, P.R. China), Hui Li (Xiangtan University, P.R. China), Wenlang Deng (School of Information Engineering, Xiangtan University, P.R. China)	3244
<i>An No power failure ice melting system based on flux controlled reactor</i>	
Yuning Hou (Huazhong University of Science and Technology, P.R. China), Haifei Wang (Huazhong University of Science and Technology, P.R. China), MY Xue (Huazhong University of Science and Technology, P.R. China), Tingkang Wang (School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, P.R. China), Cong Wang (Huazhong University of Science and Technology, unknown), Jianchun Chen (Huazhong University of Science and Technology, unknown)	3250
<i>Detection Method for Electric Theft Based on SOM Neural Network and K-means Clustering Algorithm</i>	
Guo Lingqing (North China Electric Power University, P.R. China)	3255
<i>A Coordinated Control Strategy of Flywheel Array System for Multi-objective Optimization</i>	
Hongwei Ma (Beijing Institute of Technology, P.R. China), Jingpan Ren (Beijing Institute of Technology, P.R. China)	3260
<i>Monitoring and Protection System Design for High Temperature SMES</i>	
MY Xue (Huazhong University of Science and Technology, P.R. China), Tingkang Wang (School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, P.R. China), Yuning Hou (Huazhong University of Science and Technology, P.R. China), Haifei Wang (Huazhong University of Science and Technology, P.R. China), Yixiang Du (Huazhong University of Science and Technology, P.R. China), Jianchun Chen (Huazhong University of Science and Technology, unknown)	3265
<i>A Three-Phase Allocation Strategy Solving Three-Phase Unbalance Problem in Air Conditioners' Applications</i>	
Yanbo Che (Tianjin University, P.R. China), Siyuan Xue (Tianjin University, P.R. China), Wei He (State Grid Jiangxi Electric Power Research Institute, P.R. China), Hailian Bi (Tianjin University, P.R. China), Liangliang Liu (Tianjin University, P.R. China)	3269

## Other Related Topics (QC)

<i>Self-optimizing Droop Control and Quasi-Synchronization Strategy Based on Emergency Power Source</i>	
Bin Zhao (Zhejiang University, P.R. China), Yuzhou Zhang (Zhejiang University, P.R. China), Feng Jiang (Zhejiang University, P.R. China), Junfeng Zhang (Guangdong Power Grid Corporation, P.R. China), Min Chen (Zhejiang University, P.R. China)	3274
<i>Adaptive Dynamic State Estimation Method for Distribution Networks with Enhanced Robustness</i>	
Xuanyong Zhang (Tianjin University, P.R. China), Xiangyu Kong (Tianjin University, P.R. China)	3278
<i>In-Band Full-Duplexing (IBFD) based Cross-Layer Channel Access for In-Home Power Line Communication system</i>	
Honghong Pu (Harbin Institute of Technology, P.R. China), Xiao-sheng Liu (Harbin Institute of Technology, P.R. China), Jian Cao (Harbin Institute of Technology, P.R. China), Jiarui Zhang (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China)	3283
<i>Modeling and Fault Characteristic Analysis of an Offshore Multi-Platform Interconnected Power System</i>	
Kang Zhong (Zhejiang University, P.R. China), Wei Chen (Zhejiang University, P.R. China), Taiying Zheng (Zhejiang University, P.R. China)	3289
<i>Ordered charging optimization of electric vehicles based on charging load spatial transfer</i>	
Shaoyun Ge (Tianjin University, P.R. China), Jun Yan (Tianjin University, P.R. China), Hong Liu (Tianjin University, P.R. China)	3294

<i>A Networking Method for Power Line Communication Based on Stereo Mesh Network</i> Jiarui Zhang (Harbin Institute of Technology, P.R. China), Xiao-sheng Liu (Harbin Institute of Technology, P.R. China), Pengfei Chen (Harbin Institute of Technology, P.R. China), Honghong Pu (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China) .....	3300
<i>Electrode Shape Optimization of Electrostatic Chuck for Uniform Force Distribution using Continuum Sensitivity Analysis</i> Jong Oh Park (SungKyunKwan University, Korea), Chan Young Choi (SungKyunKwan University, Korea), Jun Seong Lee (Sungkyunkwan University, Korea), Seung Geon Hong (Sungkyunkwan University, Korea), IL Han Park (Sungkyunkwan University, Korea) .....	3305
<i>Soft Start Control Strategy for Hybrid MMC in Solar Power DC Collection System</i> Shiqing Guan (North China Electric Power University, P.R. China), Yanjun Tian (North China Electric Power University, P.R. China), Yi Wang (North China Electric Power University, P.R. China), Haonan Gao (North China Electric Power University, P.R. China) .....	3310
<i>Modeling and Optimization of IRTMB for High-Speed Motor Considering Magnetic Flux Leakage Effect</i> Xiangyang Ye (Beihang University, P.R. China), Shiqiang Zheng (Beihang University, P.R. China), Yiming Zhang (Beihang University, P.R. China), Zan He (Beihang University, P.R. China) .....	3315
<i>An Improved Phase Shift Control to Reduce Current Stress for Dual Active Bridge DC-DC Converter</i> Lingyu Huang (North China Electric Power University, P.R. China), Yi Wang (North China Electric Power University, P.R. China) .....	3320
<i>Analysis of Influence of Air Source Heat Pump Load on Distribution Network Power Quality</i> Hailian Bi (Tianjin University, P.R. China), Yanbo Che (Tianjin University, P.R. China), Siyuan Xue (Tianjin University, P.R. China), Wei He (State Grid Jiangxi Electric Power Research Institute, P.R. China), Liangliang Liu (Tianjin University, P.R. China) .....	3326
<i>Design Method and Experiment of Wireless Power Supply System of Reflected Impedance</i> Chunlai Yu (Heilongjiang Electric Power Company Limited Electric Power Research Institute, P.R. China), Yuanting HU (Heilongjiang Electric Power Company Limited Electric Power Research Institute, P.R. China), Guoqiang LI (Heilongjiang Electric Power Company Limited Electric Power Research Institute, P.R. China), Hongda Zhang (Heilongjiang Electric Power Company Limited Electric Power Research Institute, P.R. China), Jinda Zhu (NARI Group Corporation, P.R. China), Chunbo Zhu (Harbin Institute of Technology, P.R. China) .....	3332
<i>Study on Rapid Electromagnetic Braking of BLDC Motors Used in Automatic Top Load Washers under Direct Driving</i> Yong Li (Harbin Institute of Technology, P.R. China), Danhe Wang (Harbin Institute of Technology, P.R. China), Qian Wang (Harbin Institute of Technology, P.R. China), Baochao Wang (Harbin Institute of Technology, P.R. China), Meng Zhao (Harbin Institute of Technology, P.R. China), Pengcheng MA (Harbin Institute of Technology, P.R. China) .....	3336
<i>Online Monitoring of IGBT Junction Temperature Based on Vce Measurement</i> Han Cao (University of Chinese Academy of Sciences, P.R. China), Puqi Ning (Institute of Electrical Engineering Chinese Academy of Sciences, P.R. China), Hui Xu Wen (Institute of Electrical Engineering Chinese Academy of Sciences & Key Laboratory of Power Electronics and Electric Drive, P.R. China), Yuan Tianshu (University of Chinese Academy of Sciences, P.R. China) .....	3342
<i>A Turn-to-Turn Fault Detection and Inter-Windings Identification Scheme for Magnetically Controlled Shunt Reactor</i> Muhammad Asghar Khan (North China Electric Power University & COMSATS University Islamabad, Abbottabad Campus, P.R. China), Tao Zheng (North China Electric Power University, P.R. China), Liu Xiaoxiao (North China Electric Power University, P.R. China), Junqi Wei (North China Electric Power University, P.R. China) .....	3347

## Manufacturing, Testing and Standards (RA)

<i>Model Predictive Control of Bearingless Motor Model Based on Conditional Trigger</i> Zhang Duanni (Hunan University, P.R. China), Shoudao Huang (Hunan University, P.R. China), Luhan Chen (Changsha, Hunan, P.R. China), Jiabin Zhou (Hunan University, P.R. China) .....	3353
<i>Experimental Study of Steady State Performances about Brushless Doubly-Fed Machine of Cage Rotor with Public Bar and Public End Ring</i> Jiang Du (Chongqing University, P.R. China), Li Han (Chongqing University, P.R. China), Hui Li (Chongqing University, P.R. China), Xianpeng Ou (Chongqing University, P.R. China), Xuefeng Han (Chongqing University, P.R. China) .....	3359
<i>Research on Projectile Velocity of Electromagnetic Launcher Based on Speed Measurement System</i> S. c Li (Naval University of Engineering, P.R. China) .....	3365
<i>Research of small deep curved hole electrochemical machining based on pulse power supply</i> Zhaolong LI (Harbin University of Science and Technology, P.R. China), JiangHua Ge (Harbin University of Science and Technology, P.R. China) .....	3371

<i>Design of a smart socket functioned with electrical appliance identification</i>	
Chunjiao Yu (Harbin Institute of Technology, P.R. China), Pengfei Chen (Harbin Institute of Technology, P.R. China), Xiaosheng Liu (Harbin Institute of Technology, P.R. China), Liang Zhao (Harbin Institute of Technology, P.R. China), Ming Han (Harbin Institute of Technology, P.R. China), Yousu Yao (Harbin Institute of Technology, P.R. China)	3375
<i>A Test Standard for Winding Insulation and Air Gaps of Dry-Type HV-HF Transformer</i>	
Zhao Yikun (University of Chinese Academy of Sciences, P.R. China), Zhang Guoqiang (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Kang Li (IEE + CAS, P.R. China), Liu Yang (Global Energy Interconnection Research Institute, P.R. China), Yang Fuyao (Global Energy Interconnection Research Institute, P.R. China)	3380

## Electrical Engineering Education (RA)

<i>Exploration and Reform of Electronic Technology Experiments in Electrical Engineering Education</i>	
Yuxin Lian (Harbin Institute of Technology, P.R. China)	3385
<i>the Construction and Practice of Trinity Electronics Experimental Course</i>	
Wang Meng (Harbin Institute of Technology, P.R. China)	3391
<i>Bayesian Psychometrics Modeling based on the Correlation Between Inductor Saturation and Current Limitation</i>	
Junfeng Wu (Xiangtan University, P.R. China), Bin Duan (Xiangtan University, P.R. China), Yi Kuang (XiangTan University, P.R. China), Mengping Lv (XiangTan University, P.R. China)	3395

## Power converters (BA)

<i>Performance Evaluation of a Multifunctional Compensator for Three-Phase AC Power System with Pulsed Load</i>	
Lin Li (Nanjing University of Aeronautics and Astronautics, P.R. China), Hongfei Wu (Nanjing University of Aeronautics and Astronautics, P.R. China), Jianxin Zhu (Nanjing University of Aeronautics and Astronautics, P.R. China), Junyu Chen (Nanjing University of Aeronautics and Astronautics, P.R. China), Yan Xing (Nanjing University of Aeronautics and Astronautics, Spain)	3399
<i>Modelling and Stability Analysis of a Three-Port DC-DC Converter with Virtual Impedance Control for Hybrid Energy Storage System</i>	
Panbao Wang (Harbin Institute of Technology, P.R. China), Rui Huang (Harbin Institute of Technology, P.R. China), Yan Li (China Electric Power Research Institute, P.R. China), Chao Liu (China Electric Power Research Institute, P.R. China), Wang Wei (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China)	3405
<i>Auxiliary Snubber Cell for Dual Buck Full Bridge Inverter</i>	
Jian Wei (Harbin Institute of Technology, P.R. China), Baoquan Kou (School of Electrical Engineering and Automation, Harbin Institute of Technology, P.R. China), Lu Zhang (Harbin Institute of Technology, P.R. China), Haoquan Zhang (Harbin Institute of Technology, P.R. China), Wen Chen (Harbin Institute of Technology, P.R. China)	3410
<i>Efficiency Optimization of Phase-Shifted Full-Bridge through Adaptive Dead-time and Burst-mode at Very Light Load</i>	
Lei Sun (Harbin Institute of Technology, P.R. China), Xiangjun Zhang (Harbin Institute of Technology (HIT), P.R. China)	3416
<i>The Design and Simulation Research of New Interleaved DC / DC Converter</i>	
YU Zhou (Institute of Electrical Engineering, P.R. China)	3421
<i>Improved Negative Sequence current Injection Balancing Method considering Zero Sequence Voltage for cascaded H-bridge STATCOM</i>	
Lingda Li (Harbin Institute of Technology, P.R. China), Jianze Wang (Harbin Institute of Technology, P.R. China), Ningning Li (Northeast Agricultural University, P.R. China), Zhenlei Yu (Tianjin Weiwei Electric Co., Ltd., P.R. China), Xiangyu Sai (Yunnan Electric Power Dispatching Control Center, P.R. China)	3427
<i>A Sliding Mode Control of Vienna Rectifier Based on Improved Double Power Reaching Law</i>	
Huixian Huang (Xiangtan University, P.R. China), Yiqi Li (Xiangtan University, P.R. China)	3431
<i>Improved Cockcroft-Walton Single Stage High Voltage Gain Inverter</i>	
Xinping Ding (Qingdao University of Technology, P.R. China), Delin Zhao (Qingdao University of Technology, P.R. China), Yun Liu (Qingdao University of Technology, P.R. China), Yangyang Hao (Qingdao University of Technology, P.R. China), Kai Li (Qingdao University of Technology, P.R. China)	3437

<i>A Novel Z-source Inverter with Voltage Multiplier Cells</i> Xinping Ding (Qingdao University of Technology, P.R. China), Yun Liu (Qingdao University of Technology, P.R. China), Delin Zhao (Qingdao University of Technology, P.R. China), Kai Li (Qingdao University of Technology, P.R. China), Yangyang Hao (Qingdao University of Technology, P.R. China) .....	3442
<i>Fast Control Strategy of APF Based on Improved DFT Algorithm and Repetitive Control with Multiple Control Frequency in Synchronous Rotation Coordinates</i> Qunwei Xu (State Grid Zhejiang Electric Power Research Institute, P.R. China), Zhun Hu (E. Energy Technology Co., Ltd, P.R. China), Jun Wu (State Grid Zhejiang Electric Power Research Institute, P.R. China), Wentao Lv (State Grid Zhejiang Electric Power Research Institute, P.R. China), Hongyang Huang (State Grid Zhejiang Electric Power Research Institute, P.R. China) .....	3448
<i>An Adaptive Voltage Control for DC/AC Converter with a Combined Inductor/Capacitor Voltage Sensing</i> Wenhan Zhang (Tianjin University, P.R. China), Jinwei He (Tianjin University, P.R. China), Junfei Han (Inner Mongolia Power Group Corporation, P.R. China) .....	3454
<i>Switching Transformer-Based LLC Resonant Converter for Efficiency Improvement in Wide Range of Light Load</i> Liu Xiaodong (Anhui University of Technology, P.R. China), Baocheng Dong (Anhui University of Technology, P.R. China), Sucheng Liu (Anhui University of Technology, P.R. China), Huihui Wu (Anhui University of Technology, P.R. China), Kun Zhang (Anhui University of Technology, P.R. China) .....	3460
<i>A Design of Three-phase Grid-connected Inverter Applied to Subway System</i> Xing Wang (Huazhong University of Science and Technology, P.R. China), Kai Yang (Huazhong University of Science and Technology, P.R. China), Weijian Zhang (Huazhong University of Science and Technology, P.R. China), Huan Zhang (Huazhong University of Science and Technology, P.R. China) .....	3466
<i>Power Electronic Load System for Motor Drivers Testing Considering Motor Faulty Status Simulation</i> Qingwen Yang (Zhejiang University, P.R. China), Huan Yang (Zhejiang University, P.R. China), Xiaowei Gu (Zhejiang Sci-Tech University, P.R. China), Shaomin He (Zhejiang University, P.R. China), Zhuojian Cai (Davy Technology Co., Ltd, P.R. China) .....	3470
<i>Critical Parasitic Elements of Coupled Inductors for Ultra-High Voltage Flyback Converters Used to Drive Capacitive Actuators</i> Raphael Mottet (École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, Switzerland), Morgan Almanza (École Polytechnique Fédérale de Lausanne (EPFL), Switzerland), Alexis Boegli (Ecole Polytechnique Fédérale de Lausanne, Switzerland), Yves Perriard (Laboratory director, Switzerland) .....	3476
<i>Design of Multiphase Inverter System for Variable-Speed Applications Based on DSP and FPGA</i> Haifeng Guo (Huazhong University of Science and Technology, P.R. China), Ruodong Wang (Huazhong University of Science and Technology, P.R. China), Wubin Kong (Huazhong University & Technology, P.R. China), Ronghai Qu (Huazhong University of Science and Technology, P.R. China) .....	3481
<i>Modulation Area Limitation Method Based on Three-Level Neutral-Point-Clamped Inverter in Tethered Drone Motor Drive Applications</i> Huida Gao (Huazhong University of Science and Technology, P.R. China), Ming Zha (China Shipbuilding Industry Corporation, P.R. China), Qiaopo Xiong (China Shipbuilding Industry Corporation, P.R. China), Liang Chang (Huazhong University of Science and Technology, P.R. China), Wubin Kong (Huazhong University & Technology, P.R. China), Ronghai Qu (Huazhong University of Science and Technology, P.R. China) .....	3485

## Power converters(BB)

<i>Model-based Disturbance Rejection for Current Control of Bidirectional Single-Phase AC/DC Converters Used in Household Energy Router</i> Liang Zhao (Harbin Institute of Technology, P.R. China), Xiaosheng Liu (Harbin Institute of Technology, P.R. China), Kaixuan Wang (92 West Dazhi Street, Nan Gang District, Harbin, P.R. China), Ming Han (Harbin Institute of Technology, P.R. China), Yousu Yao (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China) .....	3489
<i>A Capacitor Voltage Sorting Algorithm for Modular Multilevel Converters(MMC) under Low-Frequency Carrier Modulation</i> Zirui Liu (Huazhong University of Science and Technology, P.R. China), Wenjuan Yu (Central China Branch of State Grid Corporation of China, P.R. China), Haifeng Guo (Huazhong University of Science and Technology, P.R. China), Wubin Kong (Huazhong University & Technology, P.R. China), Chun Gan (Huazhong University of Science and Technology, P.R. China), Ronghai Qu (Huazhong University of Science and Technology, P.R. China) .....	3495
<i>A Double-Voltage Vector Based Model Predictive Control Method for Three Phase Four-Switch Fault-Tolerant Converter</i> Leilei Guo (Zhengzhou University of Light Industry, P.R. China), Kaixuan Zhang (Zhengzhou University of Light Industry, P.R. China), Lingzhi Cao (Zhengzhou University of Light Industry, P.R. China), Linwang Dai (China Electric Power Research Institute, P.R. China), Nan Jin (Zhengzhou University of Light Industry, P.R. China), Yanyan Li (Zhengzhou University of Light Industry, P.R. China) .....	3499

<i>High Power Factor Induction Heating Power Supply for Forging Applications Using Three-Phase Three-Switch PWM Current Source Rectifier</i>	
Moo-Seok Goh (Pukyong National University, Korea), Seung-Soo Choi (Pukyong National University, Korea), Jin-Yeol Yu (Pukyong National University, Korea), In-Dong Kim (Pukyong National University, Korea) .....	3505
<i>Research on the Electromagnetic Energy Transfer Process of High Power AC-DC-AC Converter</i>	
Pei Yang (ARIM, P.R. China), Chongjian Li (Automation Research and Design Institute of Metallurgical Industry, P.R. China), Chengsheng Wang (Chinese Academy of Sciences, P.R. China), Qiongtao Yang (Automation Research and Design Institute of Metallurgical Industry, P.R. China), Pan Wang (Beijing Aritime Intelligent Control Co., LTD., P.R. China), Shijiong Zhou (Automation Research and Design Institute of Metallurgical Industry, P.R. China) .....	3510
<i>A High Efficiency and Low Shutdown Current Bidirectional DC-DC CLLC Resonant Converter</i>	
Lu Qu (Shenzhen Graduate School of Harbin Institute of Technology, P.R. China) .....	3515
<i>Research on Performance Improvement for STATCOM with LCL Filter Based on ABC-Pareto Multi-objective Optimization Algorithm</i>	
Minglei Wang (Harbin Institute of Technology, P.R. China), Xiangyu Wang (Northeast Petroleum University, P.R. China), Ligu Wang (Harbin Institute of Technology, P.R. China), Jinxin Qiao (Harbin Institute of Technology, P.R. China) .....	3521
<i>Parallel grid-tied converters line current harmonic reduction through decentralized interleaving PWM modulation</i>	
Zhe Dong (University of Tianjin, P.R. China), Shibo Wang (Shandong Electric Power Research Institute, P.R. China), Jinwei He (Tianjin University, P.R. China), Junfei Han (Inner Mongolia Power Group Corporation, P.R. China) .....	3527
<i>Carrier-Based Space Vector Pulse Width Modulation Strategy Without Even Harmonics for Three-Level Neutral Point Clamped Converter</i>	
Zhan Gao (Key Laboratory of Power Electronics and Electric Drive, Institute of Electrical Engineering & University of Chinese Academy of Sciences, P.R. China), Lu Zhao (Chinese Academy of Sciences, unknown), Qiongxuan Ge (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Yaohua Li (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Pengkun Sun (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China) .....	3532
<i>Neutral-Point Voltage Balancing Strategy for Three-Level Neutral Point Clamped Inverter Based on On-line Calculating Redundant Vector Duty Cycles</i>	
Zhan Gao (Key Laboratory of Power Electronics and Electric Drive, Institute of Electrical Engineering & University of Chinese Academy of Sciences, P.R. China), Lu Zhao (Chinese Academy of Sciences, unknown), Qiongxuan Ge (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Yaohua Li (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Zhang Bo (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China) .....	3538
<i>Analysis and Design of a 500W Single-switch Contactless Resonant Converter</i>	
Shuai Zhang (Nanjing University of Aeronautics and Astronautics, P.R. China), Qianhong Chen (Nanjing University of Aeronautics & Astronautics, P.R. China), Zhibin Li (Nanjing University of Aeronautics and Astronautics, P.R. China), Xiaoyong Ren (Nanjing University of Aeronautics & Astronautics, P.R. China), Zhiliang Zhang (Nanjing University of Aeronautics & Astronautics, P.R. China) .....	3544
<i>High Step-Up Boost Converter With Asymmetric Voltage Multiplier cell for Distributed PV Generation Systems</i>	
Jian Ai (Southeast University, P.R. China), Mingyao Lin (Southeast University, P.R. China), Wei Le (Southeast University, P.R. China), Zehua Chen (Southeast University, P.R. China), Lun Jia (Southeast University, P.R. China) .....	3549
<i>Minimum Backflow Power Control of the Hybrid Three Level Isolated Bi-Directional DC-DC Converters Based on PWM-Phase-Shifting Control</i>	
Yang Chao (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Haiping Xu (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China) .....	3554
<i>Analysis, Modeling and Implementation of Novel DC-DC Converter Based on Interleaved and Cascaded Topology for Fuel Cell Vehicles</i>	
Zengquan Yuan (Institute of Electrical Engineering Chinese Academy of Sciences, P.R. China), Haiping Xu (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Xi Chen (Institute of Electrical Engineering, P.R. China) .....	3560
<i>A Novel Three-level Submodule for Modular Multilevel Converter with DC Fault Blocking Capability</i>	
Weiyang Hou (Hunan University, P.R. China), Zhiwen Zhang (Hunan University, P.R. China), Ruizhi He (Hunan University, P.R. China), Shoudao Huang (Hunan University, P.R. China) .....	3566
<i>Thermal Analysis on IGBT Module Based Rotor Side Converter of Doubly-fed Wind Turbine by Considering Inter-harmonic Current</i>	
Yu Hu (Chongqing University, P.R. China), Hui Li (Chongqing University, P.R. China), Jing Liu (CSIC HaiZhuang Windpower Co., P.R. China), Xiangjie Xie (Chongqing University, P.R. China), Tian Yang (Chongqing University, P.R. China), You Wu (Chongqing University, P.R. China) .....	3571
<i>Design and Implement of an Active-clamp Isolated Boost Converter for PV System</i>	
Jiye Liu (Tsinghua University, P.R. China), Zedong Zheng (Tsinghua University, P.R. China), Yongdong Li (Tsinghua University, P.R. China) .....	3577

<i>Sliding Mode Control Based on a Linear Quadratic Regulator for Current-Fed Dual Active Bridge Converter</i>	
Ming Han (Harbin Institute of Technology, P.R. China), Xiaosheng Liu (Harbin Institute of Technology, P.R. China), Liang Zhao (Harbin Institute of Technology, P.R. China), Kaixuan Wang (92 West Dazhi Street, Nan Gang District, Harbin, P.R. China), Yousu Yao (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China)	3582

## Power converters(BC)

<i>An Islanded Microgrid Using Open End Stator DFIG with Inherent Energy Storage Unit</i>	
Baiyang Sun (Tianjin University, P.R. China), Jinwei He (Tianjin University, P.R. China), Junfei Han (Inner Mongolia Power Group Corporation, P.R. China)	3586
<i>Impact of the Parasitic Resistors in Compensation Inductors on a Multi-stage and Multi-load Wireless Power Transfer System</i>	
Zhe Zhou (Global Energy Interconnection Research Institute, P.R. China), Fangyi Li (Global Energy Interconnection Research Institute, P.R. China), Chao Wang (Tsinghua University, P.R. China), Qing Lin (Tsinghua University, P.R. China), Kui Wang (Tsinghua University, P.R. China), Yongdong Li (Tsinghua University, P.R. China)	3592
<i>Simplified Large Signal Stability Analysis of MPPT-Controlled PV Interfacing DC/DC Converter Based on a Lyapunov-Like Function</i>	
Xiaodong Liu (Anhui University of Technology, P.R. China), Yunze Tang (Anhui University of Technology, P.R. China), Yawei Wu (Anhui University of Technology, P.R. China), Jiazhu Zheng (Anhui University of Technology, P.R. China), Wei Fang (Anhui University of Technology, P.R. China), Sucheng Liu (Anhui University of Technology, P.R. China)	3597
<i>Three-level H-Bridge Chopper for High Ceiling Voltage VSC Excitation System</i>	
Jiancheng Zhang (State Grid Zhejiang Electric Power Research Institute, P.R. China), Bing Han (NR Electric Co., Ltd, P.R. China), Hongtao Xiong (State Grid Zhejiang Electric Power Research Institute, P.R. China), Long Wu (NR Electric Co., Ltd, P.R. China), Kuayu Wu (NR Electric Co., Ltd, P.R. China), Boliang Lou (State Grid Zhejiang Electric Power Research Institute, P.R. China)	3602
<i>Design and optimization of PCCM interleaved Boost converter for photovoltaic power generation system</i>	
Linkai Liu (North China University of Technology, P.R. China), Qinghai Meng (North China University of Technology, P.R. China)	3607
<i>Optimization of High Power Density AC-DC Converter Based on Silicon Carbide Device for UAV</i>	
Kun Yang (Beihang University, P.R. China), Hao Qian (Beihang University, P.R. China), Mingfei Cai (Nanjing Chenguang Group, P.R. China), Qinling Zhang (BeiHang University, P.R. China), Xu Jiang (Beihang University, P.R. China)	3613
<i>Optimization of Energy Management System for Fuel-Cell/Battery Hybrid Power in Unmanned Aerial Vehicle</i>	
Kun Han (BeiHang University, P.R. China), Hao Qian (Beihang University, P.R. China), Qinling Zhang (BeiHang University, P.R. China), Lumi Liu (Beijing Institute of Control Engineering, P.R. China), Xuanyang Hu (Beihang University, P.R. China)	3619
<i>A Novel SEPIC Based Converter with High Voltage Gain and ZVS Characteristic</i>	
Shanshan Gao (Harbin Institute of Technology, P.R. China), Yining Liu (HIT, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China), Yijie Wang (Harbin Institute of Technology, P.R. China), Yueshi Guan (Harbin Institute of Technology, P.R. China), Yousu Yao (Harbin Institute of Technology, P.R. China)	3625
<i>Plug-in of An Extra Power Module into Parallel-Modules with Unknown Current Sharing Strategies</i>	
Xiaodong Liu (Anhui University of Technology, P.R. China), Huihui Wu (Anhui University of Technology, P.R. China), Sucheng Liu (Anhui University of Technology, P.R. China), Wei Fang (Anhui University of Technology, P.R. China), Baocheng Dong (Anhui University of Technology, P.R. China), Longfei Tang (Anhui University of Technology, P.R. China)	3631
<i>High Bandwidth DC-DC Converter with Active Current Ripples Injection</i>	
Mao Shunkang (Beijing Institute of Technology, P.R. China), Gao Congzhe (Beijing Institute of Technology, P.R. China)	3636
<i>High Efficiency LLC Converter Design Using a novel Modelling Method based on SiC MOSFET</i>	
Shuqin Cao (North China University of Technology, P.R. China), Yuan Zhang (North China University of Technology - Beijing, P.R. China), Chunyu Zheng (North China University of Technology, P.R. China)	3641
<i>Research on Control Strategy for Multi-port Power Electronics Transformer Based on Interphase Coupling MMC Topology</i>	
Rong Xu (Global Energy Interconnection Research Institute Europe GmbH, Germany), Xiang Wu (Global Energy Interconnection Research Institute Europe GmbH, Germany), Haijun Liu (Global Energy Interconnection Research Institute, P.R. China), Zhe Zhou (Global Energy Interconnection Research Institute, P.R. China), Hang Yin (Global Energy Interconnection Research Institute Europe GmbH, Germany), Tian Lan (Global Energy Interconnection Research Institute Europe GmbH, Germany), Yuanliang Lan (Global Energy Interconnection Research Institute Europe GmbH, Germany)	3646

<i>Bidirectional DC-DC Converter based on CLC network</i>	
Yiliang Li (Harbin Institute of Technology, P.R. China), Yijie Wang (Harbin Institute of Technology, P.R. China), Hongyu Song (Harbin Institute of Technology, P.R. China) .....	3651
<i>Calculation and Analysis of Residual Energy Storage in Intrinsically Safe Buck Converter</i>	
Qinghai Meng (North China University of Technology, P.R. China), Weiqing Huang (North China University of Technology, P.R. China) .....	3655
<i>Efficiency Optimization Strategy of Three Port Triple Active Bridge DC-DC Converter</i>	
Yuhua Ye (Zhejiang University, P.R. China), Heng Nian (Zhejiang University, P.R. China), Liang Kong (Zhejiang University, unknown), Danping Zheng (Zhejiang University, P.R. China) .....	3659
<i>Comparative Analysis of Isolated Bidirectional Dual-Active-Bridge DC-DC Converter Based on EPS and DPS</i>	
Shengwen Fan (North China University of Technology, P.R. China), Yanpeng Li (North China University of Technology, P.R. China), Yiqin Yuan (North China University of Technology, P.R. China) .....	3665
<i>A two-stage soft-switching photovoltaic grid-connected inverter based on pulse DC voltage link</i>	
Haiwei Liu (Hunan University, P.R. China) .....	3671

## Power converters (BD)

<i>A Robust Modified Model Predictive Control Algorithm for Quasi-Z Source Inverter</i>	
Siyu Qin (Hunan University, P.R. China), Ping Liu (Hunan University, P.R. China), Shoudao Huang (Hunan University, P.R. China) .....	3676
<i>A Hybrid Discontinuous PWM Neutral Point Balance Method Based on Zero-Sequence Component for Three-Level NPC Converter</i>	
Haochen Zhang (Harbin Institute of Technology, P.R. China), Weilin Zheng (Harbin Institute of Technology, P.R. China), Yanxue Yu (Harbin Institute of Technology, P.R. China), Haoyu Li (Harbin Institute of Technology, P.R. China) .....	3681
<i>Impedance Modeling and Stability Analysis of Weak-Grid Interfaced Single-Phase VSG</i>	
Xinying Zhang (Nanjing University of Aeronautics and Astronautics (NUAA), P.R. China), Jie Chen (Nanjing University of Aeronautics and Astronautics (NUAA), P.R. China), Xin Chen (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	3686
<i>Research on Parallel Current Sharing Scheme of 1200V/100A SiC MOSFET</i>	
Jiaming Tu (Harbin Institute of Technology, P.R. China), Hongqi Ben (Harbin Institute of Technology (HIT), P.R. China), Tao Meng (Heilongjiang University, P.R. China), Zhiyuan Yao (Harbin Institute of Technology, P.R. China), Jichao Ning (Harbin Institute of Technology, P.R. China) .....	3692
<i>Series-type Active Ripple Suppression and Damping Control of a Novel Grid-Connected Inverter</i>	
Yifan Lu (Beijing Institute of Technology, P.R. China), MiaoMiao Wei (Beijing Institute of Technology, P.R. China), Gao Congzhe (Beijing Institute of Technology, P.R. China) .....	3696
<i>A New Model Predictive Control Strategy for Quasi-Z-Source Inverters</i>	
Chao Liu (Hunan University, P.R. China), Ping Liu (Hunan University, P.R. China), Huidan Luo (Hunan University, P.R. China), Shoudao Huang (Hunan University, P.R. China), Jie Xu (Hunan University, P.R. China) .....	3702
<i>Steady-state Error's Suppression Strategy for Continuously Frequency-Adjustment Inverter</i>	
Zhiyuan Yao (Harbin Institute of Technology, P.R. China), Hongqi Ben (Harbin Institute of Technology (HIT), P.R. China), Tao Meng (Heilongjiang University, P.R. China), Jichao Ning (Harbin Institute of Technology, P.R. China), Jiaming Tu (Harbin Institute of Technology, P.R. China) .....	3707
<i>A New Control Method for Bidirectional Isolated AC/DC Matrix Converter</i>	
Wenlang Deng (School of Information Engineering, Xiangtan University, P.R. China), Honghua Liu (School of Information Engineering, Xiangtan University, P.R. China), Yaqian Liu (School of Information Engineering, Xiangtan University, P.R. China) .....	3712
<i>A Novel Design and Analysis Method for LCCR Filter used for Current Harmonics Mitigation of High Speed Machine</i>	
Le Pei (Harbin Institute of Technology, P.R. China), Qiming Chen (Harbin Institute of Technology, P.R. China), Jiayi Liu (Harbin Institute of Technology (HIT), P.R. China), Liyi Li (Harbin Institute of Technology, P.R. China), Xu Yi (Shanghai Institute of Satellite Engineering, P.R. China) .....	3718
<i>High power Integrated Charging System for Electrical Vehicles Based on Winding Multiplexing of PMSM</i>	
Zhiwei Xu (Zhejiang University, P.R. China), Shaomin He (Zhejiang University, P.R. China), Wei Chen (Zhejiang University, P.R. China), Huan Yang (Zhejiang University, P.R. China) .....	3723
<i>A Diagnosis Strategy for High-Frequency Link Bidirectional AC-DC Matrix Converter</i>	
Wenlang Deng (School of Information Engineering, Xiangtan University, P.R. China), Yaqian Liu (School of Information Engineering, Xiangtan University, P.R. China), Honghua Liu (School of Information Engineering, Xiangtan University, P.R. China) .....	3728

<i>Electro-thermal Analysis of the Coupled Inductor for Quasi-Z Source Inverters</i> Wenshu Peng (Hunan University, P.R. China), Ping Liu (Hunan University, P.R. China), Minjie He (Hunan University, P.R. China) .....	3734
<i>Analysis of Output Distortion in Asymmetric Sinusoidal Inverter</i> Jichao Ning (Harbin Institute of Technology, P.R. China), Hongqi Ben (Harbin Institute of Technology (HIT), P.R. China), Tao Meng (Mechanical and Electrical Engineering, Heilongjiang University, P.R. China), Zhiyuan Yao (Harbin Institute of Technology, P.R. China), Jiaming Tu (Harbin Institute of Technology, P.R. China), Huishuang Fan (Harbin Institute of Technology, P.R. China) .....	3740
<i>Analysis and Improvement of Steady-State and Dynamic Performance of SVPWM Based Three-Phase VIENNA Rectifier</i> Shen Jiaqian (Nanjing University of Aeronautics and Astronautics, P.R. China), Jie Chen (Nanjing University of Aeronautics and Astronautics, P.R. China), Chunying Gong (Nanjing University of Aeronautics & Astronautics, P.R. China) .....	3744
<i>Power-Hardware-In-The-Loop stability analysis of inverter</i> Yao Huang (Hefei University of Technology, P.R. China), Li Fei (HFUt, P.R. China) .....	3750
<i>A New Multi-Port Power Electronic Transformer for Distribution Grid</i> Yumeng Shao (Kunming University of Science and Technology, P.R. China), Xiaoting Deng (Kunming University of Science and Technology, P.R. China), Sizhao Lu (Kunming University of Science and Technology, P.R. China), Siqi Li (Kunming University of Science and Technology, P.R. China) .....	3755
<i>A New Interleaved Two-phase Quasi Three-level DC-DC Modular Multilevel Converter With Coupled Inductors</i> Di Zhao (Kunming University of Science and Technology, P.R. China), Xiaoting Deng (Kunming University of Science and Technology, P.R. China), Sizhao Lu (Kunming University of Science and Technology, P.R. China), Siqi Li (Kunming University of Science and Technology, P.R. China) .....	3760

## Power converters (BE)

<i>A Flexible and Fast Space Vector Pulse Width Modulation Technique for Multilevel Converters</i> Hongjian Lin (Southwest Jiaotong University, P.R. China), Rongxin Chen (Southwest Jiaotong University, P.R. China), Ruoyu Li (Southwest Jiaotong University, P.R. China), Leilei Zhu (Southwest Jiaotong University, P.R. China), Han Yan (Southwest Jiaotong University, P.R. China), Zeliang Shu (Southwest Jiaotong University, P.R. China) .....	3766
<i>A Novel Space Vector Modulation for the 3x5 Direct Matrix Converter</i> Wei Cai (Navy Submarine Academy, P.R. China), Zongliang Wang (Navy Submarine Academy, P.R. China), Shuo Sun (Navy Submarine Academy, P.R. China) .....	3770
<i>Model Predictive Control for Three-Phase Four-Wire power quality regulation under Unbalanced Power Grid</i> Hengzhi Lv (Pingdingshan Industrial College of Technology, P.R. China), Tao Zhang (Zhengzhou University of Light Industry, P.R. China), Nan Jin (Zhengzhou University of Light Industry, P.R. China), Chao Pan (Zhengzhou University of Light Industry, P.R. China), XiaoQiang Ma (State Grid Sanmenxia Power Supply Company, P.R. China), HuiLi Wang (State Grid Sanmenxia Power Supply Company, P.R. China), Yanyan Li (Zhengzhou University of Light Industry, P.R. China), Jianshan Liu (Suoling Electric Co., Ltd, P.R. China) .....	3776
<i>Development of Bidirectional AC-DC Converter for Energy Storage Systems</i> Eung-Seok Kim (WintechAutomation Co., Ltd., Korea), Cherl-Jin Kim (Korea Polytechnic University, Korea), Young-Tae Kim (Gangneung-Wonju National University, Korea) .....	3781
<i>Capacitor Voltage Ripple Analysis of Hybrid Modular Multilevel Converter in Fan-/Pump-like Load Applications</i> Linjie Han (Harbin Institute of Technology, P.R. China), Binbin Li (Harbin Institute of Technology, P.R. China), Shaoze Zhou (Harbin Institute Of Technology, P.R. China), Jingkun Wang (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China) .....	3785
<i>Research on Double Coupled Inductor High Gain Boost Converter with Absorption Circuit</i> Long-ji Zhu (Anhui University of Science and Technology, P.R. China), Guo-ping Wang (Anhui University of Science and Technology, P.R. China) .....	3790
<i>Operation Control Algorithm of ESS with High Reliability</i> Jeong Lee (Sungkunkwan University, Korea), Jun-Mo Kim (Sungkunkwan University, Korea), Ryu Kyung (Sungkyunkwan University, Korea), Chung-Yuen Won (Sungkyunkwan University, Korea) .....	3796
<i>A Study on the High Power Factor and Efficiency PFC Circuit using Wide Band-Gap Semiconductors for Ship Charger</i> Dong-Wook Kim (Research Institute of Medium & Small Shipbuilding & Ministry of Trade, Industry and Energy, Korea), Keun-Seok Park (Affiliation, Korea), Ki-Chan Kim (Hanbat National University, Korea) .....	3801
<i>Research on Control Strategy of M3C Matrix Converter System</i> Wenjie Wang (Hangzhou Dianzi University, P.R. China), Lijun Hang (Hangzhou Dianzi University, P.R. China), Jian Qiu (Hangzhou Dianzi University, P.R. China), Hao Lu (Hangzhou Dianzi University, P.R. China), Shitao Wang (State Grid of China Technology College, P.R. China), Shenglun Chen (Anhui Ledtu Electronic Technology Co., Ltd., P.R. China) .....	3805



<i>Modular EV Rapid Charger Design and Control Method</i>	
Jun-Mo Kim (Sungkwan University, Korea), Jeong Lee (Sungkwan University, Korea), Tae-Ho Eom (Sungkyunkwan University, Korea), Ryu Kyung (Sungkyunkwan University, Korea), Min-Ho Shin (APEL, Korea), Chung-Yuen Won (Sungkyunkwan University, Korea)	3810
<i>Three-Phase Bridgeless AC/DC PFC with LLC Resonant Circuit for High Efficiency and Low Input Current THD</i>	
Kyung-Min Kang (Sungkyunkwan University, Korea), Jin-Wook Kang (Sungkyunkwan University, Korea), Bong Yeon Choi (Sungkyunkwan University, Korea), Hoon Lee (Sungkyunkwan University, Korea), Jun-Ho Song (Sungkyunkwan University, Korea), Chung-Yuen Won (Sungkyunkwan University, Korea)	3815
<i>Transient Analysis of Quasi-Resonant Converter Based on Equivalent Small Parameter Method Considering Different Time Scale</i>	
Darong Wen (South China University of Technology, P.R. China), Yanfeng Chen (South China University of Technology, P.R. China), Bo Zhang (South China University of Technology, P.R. China), Dong Yuan Qiu (South China University of Technology, P.R. China), Fan Xie (South China University of Technology, P.R. China), Zongqi Jiang (South China University of Technology, P.R. China)	3821
<i>ESP-based Nonlinear Description and Solution of Boost Converter Considering Devices Mechanism Model</i>	
Zongqi Jiang (South China University of Technology, P.R. China), Yanfeng Chen (South China University of Technology, P.R. China), Bo Zhang (South China University of Technology, P.R. China), Dong Yuan Qiu (South China University of Technology, P.R. China), Fan Xie (South China University of Technology, P.R. China), Darong Wen (South China University of Technology, P.R. China)	3826
<i>Research on Five-Level Output method of Three-Phase Three-Level CSI Based on Two-Level Output Current of DC Bus</i>	
Yongxiao Teng (Harbin Institute of Technology, P.R. China), Qiang Gao (Harbin Institute of Technology (HIT), P.R. China), Jiabao Kou (Harbin Institute of Technology, P.R. China), Zhinan Sha (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China)	3831
<i>A Dead-Time Compensation Method for Voltage Source Inverters</i>	
Wei Chen (Shanghai STEP Electric Corporation, P.R. China), Baisong Li (Shanghai STEP Electric Corporation, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China), Liang Cai (Shanghai STEP Electric Corporation, P.R. China)	3836
<i>Soft-Switching Technology Based NPC-Cl voltage balance for DC Port Failure</i>	
Xu Peng (Southwest Jiaotong University, P.R. China)	3842
<i>Output voltage ripple reduction control strategy for three-phase combined PFC converter under grid voltage unbalance</i>	
Huishuang Fan (Harbin Institute of Technology, P.R. China), Hongqi Ben (Harbin Institute of Technology (HIT), P.R. China), Tao Meng (Heilongjiang University, P.R. China), Mingyuan Ding (Harbin Institute of Technology, P.R. China), Jichao Ning (Harbin Institute of Technology, P.R. China)	3846

## Induction Machines and Drives (CA)

<i>A Design of APFC Module Applied in Induction Machine Driver</i>	
Weijian Zhang (Huazhong University of Science and Technology, P.R. China), Kai Yang (Huazhong University of Science and Technology, P.R. China), Wenyi Yu (Huazhong University of Science and Technology, unknown)	3851
<i>Study of Integrated Vector Control for Brushless Doubly-Fed Machine</i>	
Renxiao Wang (Chongqing University, P.R. China), Li Han (Chongqing University, P.R. China), Bin Wang (Chongqing University, P.R. China), Ningning Yang (Chongqing University, P.R. China), Pu Zhao (Chongqing University, P.R. China), Luocheng Yan (Chongqing University, P.R. China)	3856
<i>Segmented Multi-mode Modulation Algorithm Based on Synchronized SVPWM for Trail Transit Traction Motor</i>	
Xiaoling Mo (Hunan University, P.R. China), Keyuan Huang (Hunan University, P.R. China), Hu Fan (Hunan University, P.R. China), Haokun Wu (Hunan University, P.R. China), Wei Lv (Hunan University, P.R. China), Luhan Chen (Changsha, Hunan, P.R. China)	3861
<i>An Induction Machine with Wound Independently-Controlled Stator Coils</i>	
Konstantina Bitsi (KTH Royal Institute of Technology, Sweden), Oskar Wallmark (KTH Royal Institute of Technology, Sweden), Sjoerd Bosga (ABB Corporate Research, Sweden)	3865
<i>Research on Fluid Field of Large Induction Motor Based on Partition Method</i>	
Zhenbo Li (Harbin University of Science and Technology, P.R. China), Mengmeng Ai (Harbin University of Science and Technology, P.R. China), Lishen Xu (Harbin University of Science and Technology, P.R. China), Wencheng Wang (Harbin University of Science and Technology, P.R. China), Wenbo Li (Harbin University of Science and Technology, P.R. China), Tong Wen (Harbin University of Science and Technology, P.R. China)	3870
<i>Control of Open-End Winding Electric Drive Fed by a Dual-Inverter Configuration with Common Mode Connected DC Buses</i>	
Sun Guangmiao (School of Electrical Engineering and Automation, HeFei University of Technology, P.R. China), Shuying Yang (Hefei University of Technology, P.R. China), Zhen Xie (Hefei University of Technology, P.R. China)	3875

<i>Dynamic Startup Characteristics Analysis of Single-winding Pole Changing Line-start Canned Solid-Rotor Induction Motor with Squirrel-cage</i>	
Yinzhaoh Zheng (Huazhong University of Science and Technology, P.R. China), Libing Zhou (Huazhong University of Science and Technology, P.R. China), Jin Wang (Huazhong University of Science and Technology, P.R. China), Yiming Ma (Huazhong University of Science and Technology, P.R. China), Junchen Zhao (Huazhong University of Science and Technology, P.R. China)	3881
<i>The temperature field analysis of the carbon brush and slip ring system based on finite element analysis</i>	
Shuai Zhao (HHU, P.R. China)	3887
<i>Research on the control technology of Six-phase induction motor based with the novel flux observer speed sensorless</i>	
Lu Zhao (Chinese Academy of Sciences, unknown)	3892
<i>Study on Transient Torque, Current Characteristics and Temperature Rise of Medium High-voltage Induction Motor under Different Load Modes</i>	
Yunyan Xia (Harbin University of Science and Technology, P.R. China), Hao Du (Harbin University of Science and Technology, P.R. China), Yongsan Han (Harbin University of Science and Technology, P.R. China), Mengmeng Ai (Harbin University of Science and Technology, P.R. China)	3896
<i>Angle Compensation-Based Voltage Redistribution for Induction Motor Drives in the Field-Weakening Windup Region</i>	
Jing Zhang (Harbin Institute of Technology, P.R. China), Bo Wang (Harbin Institute of Technology, P.R. China), Yong Yu (Harbin Institute of Technology (HIT), P.R. China), Hongye Cai (Harbin Institute of Technology, P.R. China), Xu Zhang (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China)	3900
<i>Non-sinusoidal Power Supply Control Strategy Based on Rotor and Air-gap Flux Orientation for Multi-phase Induction Machine</i>	
Yan Wang (Zhejiang University, P.R. China), Jiaqiang Yang (Zhejiang University, P.R. China)	3906
<i>Control Strategy for Variable Speed Pumped Storage Power Station based on Double-fed Induction Generator under Different Grid Conditions</i>	
Xinjian Jiang (Tsinghua University, P.R. China), Ruifei He (China Southern Power Grid Company Limited, P.R. China), Peng Peng (China Southern Power Grid Company Limited, P.R. China), Xudong Sun (Tsinghua University, P.R. China)	3912
<i>An Improved Model Predictive Current Control Algorithm Considering Dynamic Response Performance of Torque and Speed</i>	
Jinyang Han (National Key Laboratory for Vessel Integrated Power System Technology, P.R. China), Weichao Li (National Key Laboratory for Vessel Integrated Power System Technology, P.R. China), Hepeng Su (National Key Laboratory for Vessel Integrated Power System Technology, P.R. China), Liang Zhou (National Key Laboratory for Vessel Integrated Power System Technology, P.R. China), Qingyun Meng (National Key Laboratory for Vessel Integrated Power System Technology, P.R. China), Cang Liu (National University of Defense Technology, P.R. China)	3918
<i>Shape Optimization of Conductor-Ferromagnetic Material Interface in Eddy Current System Using Continuum Sensitivity With Level-Set Method</i>	
Jun Hyeong Wang (Sungkyunkwan University, Korea), Kyung Sik Seo (Sungkyunkwan University, Korea), Il Han Park (Sungkyunkwan University, Korea)	3922
<i>Derivation of Mathematic Model of Megawatt Double Canned Induction Motors and Analysis of its Dynamic Performance</i>	
Lianlian Gao (Harbin University of Science and Technology, P.R. China), Yanping Liang (Harbin University of Science and Technology, P.R. China), Dongmei Wang (Harbin University of Science and Technology, P.R. China), Xu Bian (Harbin University of Science and Technology, P.R. China), Chenguang Wang (Harbin University of Science and Technology, P.R. China)	3926
<i>Enhancement of Inertial Response of an Isolated Microgrid with High Inertia Induction Motors</i>	
Nisitha Padmawansa (SLIIT, Sri Lanka), Sunil Gamini Abeyratne (University of Peradeniya, Sri Lanka), Dayan Rathnayake (Monash University, Australia), Thomas Lipo (Florida State University, USA)	3930
<i>Research on Temperature Field Distribution and Influencing Factors of Drive Motor for High Temperature Gas-Cooled Reactor</i>	
Suhao Mao (Harbin University of Science and Technology, P.R. China)	3935
<i>Multi-objective Optimization of Induction Motor with Radial Skewed Rotor</i>	
Tian Yu (Hefei University of Technology, P.R. China), Hongmei Li (Hefei University of Technology, P.R. China), Liwen Liu (Hefei University of Technology, P.R. China), Zhiwen Chen (Hefei University of Technology, P.R. China), Zhenxing Ji (Hefei University of Technology, P.R. China), Mingna Ma (HeFei University of Technology, P.R. China)	3940
<i>Synchronized SVPWM Strategy for Common Mode Voltage Reduction of High Power Inverters in the Overmodulation Region</i>	
Yuhang Duan (Dalian University of Technology, P.R. China), Ze Li (Dalian University of Technology, P.R. China), Yuanbo Guo (Dalian University of Technology, P.R. China), Xiaohua Zhang (Dalian University of Technology, P.R. China)	3944

# AC/DC Machines and Drives (DA)

<i>An Improved-Precision Voice Coil Motor Drive Method Utilizing Additional Current Feedback</i>	
Feng Guo (Harbin Institute of Technology, P.R. China), Jiayi Liu (Harbin Institute of Technology (HIT), P.R. China), Le Pei (Harbin Institute of Technology, P.R. China), Liyi Li (Harbin Institute of Technology (HIT), P.R. China), Fenghua Peng (State Grid Hunan Electric Power Company, P.R. China) .....	3949
<i>Analysis of XLPE Asynchronized Synchronous Generator Under Loss of Excitation</i>	
Yubo Shen (The State Grid Heilongjiang Electric Power Co., Ltd. Electric Power Research Institute, P.R. China), Hongda Zhang (The State Grid Heilongjiang Electric Power Co., Ltd. Electric Power Research Institute, P.R. China), Sen Lan (The State Grid Heilongjiang Electric Power Co., Ltd. Electric Power Research Institute, P.R. China), Wei Sun (The State Grid Heilongjiang Electric Power Co., Ltd. Electric Power Research Institute, P.R. China), Dewen Zhang (The State Grid Heilongjiang Electric Power Co., Ltd. Electric Power Research Institute, P.R. China), Minhu Xu (The State Grid Heilongjiang Electric Power Co., Ltd. Electric Power Research Institute, P.R. China) .....	3953
<i>An Improved Three-Phase Current Reconstruction Strategy Using Single Current Sensor with Current Prediction</i>	
Pengwei Li (Chongqing University, P.R. China), Yong Liao (Chongqing University, P.R. China), Luo Cheng Yan (Chongqing University, P.R. China), Hao Lin (Chongqing University, P.R. China) .....	3958
<i>A Review on Research Status and Development Trend of Flux Switching Machines</i>	
Hong Wu (Heilongjiang University, P.R. China), Can Wang (Shenzhen University, P.R. China) .....	3963
<i>Power Electronic Traction Transformer Based on No Phase-locked Loop Control</i>	
Jingyan Xie (Hunan University & School of Electrical and Information Engineering, P.R. China), Zhikang Shuai (Hunan University, P.R. China), Yi Hong (Hunan University, P.R. China), Yuxiang Wu (Hunan University & National Electric Power Conversion and Control Engineering Technology Research Center, P.R. China) .....	3969
<i>Data Measurements of Harmonic and Sub-harmonics Emission by AC Drive for Dry Milling System</i>	
Chongrag Boonseng (King Mounkut Instituted of Technology Ladkrabang, Bangkok, THAILAND, Thailand), Kunyanuth Kularbphetong (Suan Sunandha Rajabhat University, Thailand) .....	3974
<i>Super-Twisting Sliding Mode Observer-Based IPMSM Sensorless Control Strategy Considering VSI Nonlinearity</i>	
Donghui Yu (Dalian University of Technology, P.R. China), Jinhui Xia (Dalian University of Technology, P.R. China), Yuanbo Guo (Dalian University of Technology, P.R. China), Xiaohua Zhang (Dalian University of Technology, P.R. China) .....	3978
<i>Research on novel high torque density transverse-flux permanent magnet motor</i>	
Changpeng Lv (Wuhan Institute of Marine Electric Propulsion, P.R. China), Lichun Zhang (Wuhan Institute of Marine Electric Propulsion, P.R. China), Yang Liu (Wuhan Institute of Marine Electric Propulsion, P.R. China), Yongxiang Xu (Harbin Institute of Technology (HIT), P.R. China) .....	3984
<i>Fault Diagnosis of Frequency Control System Based on FFT</i>	
Xingguo Xia (Ma an shan Technical College, P.R. China), Pinghua Ning (Ma an shan Technical College, P.R. China) .....	3989
<i>A New Type of In-Wheel Outer Rotor Switched Reluctance Motor Drive Based on Selective Wireless Power Transfer Technology</i>	
Yangyang Li (Xi'an Jiaotong University, P.R. China), Wen Ding (Xi'an Jiaotong University, P.R. China), Kaidi Song (Xi'an Jiaotong University, P.R. China), He Bian (Xi'an Jiaotong University, P.R. China) .....	3994
<i>Dual Third-Harmonic-Current Excitation Principle of a Brushless Synchronous Machine Based on Double Three-Phase Armature Windings</i>	
Fei Yao (Donghua University, P.R. China), Dongyang Sun (Harbin Institute of Technology, P.R. China), Lizhi Sun (Harbin Institute of Technology, P.R. China), Thomas Lipo (University of Wisconsin, USA) .....	3999
<i>Rotor Design and Optimization of the Three phase Line start Synchronous Reluctance Motor</i>	
YuSheng Hu (State Key Laboratory of Air-conditioning Equipment and System Energy Conservation, P.R. China), Bin Chen (State Key Laboratory of Air-conditioning Equipment and System Energy Conservation, unknown), Yong Xiao (Electric Motor System Institute of GREE, P.R. China), Jinfei Shi (Electric Motor System Institute of GREE, P.R. China), Liyi Li (Harbin Institute of Technology (HIT), P.R. China), Xia Li (Electric Motor System Institute of GREE, P.R. China) .....	4003
<i>Control Performance of High-Speed Single-Phase Brushless DC Motors</i>	
Shichong Xia (Tsinghua University, P.R. China), Shanming Wang (Tsinghua University, P.R. China), Daqiang Bi (Tsinghua University, P.R. China) .....	4009
<i>A High Step-down DC-DC Converter with Matrix-Transformer and Wide Voltage Gain for Vehicle Power Supply Applications</i>	
Yinghui Zhang (Science and Technology on Ship Integrated Power SystemTechnology Laboratory, Wuhan, P.R. China), Xu Xiaohui (Science and Technology on Ship Integrated Power SystemTechnology Laboratory, Wuhan, China, P.R. China), Lei Zhu (Nanjing University of Aeronautics and Astronautics, P.R. China), Yanfeng Zhang (Nanjing University of Aeronautics and Astronautics, P.R. China), Hongfei Wu (Nanjing University of Aeronautics and Astronautics, P.R. China), Hu Yu (Science and Technology on Ship Integrated Power System Technology Laboratory, P.R. China) .....	4015
<i>Research on Dead Zone Compensation Method Based on Offline Calibration</i>	
Guangxin Zu (Harbin Institute of Technology, P.R. China) .....	4021

<i>Effect of Nearby Devices on Power Electronics Transformer Measurement Error</i> Zhenfei Chen (Hohai University, unknown), Chengying Li (Hohai University, P.R. China), Zhixin Li (Jiangsu Electric Power Company, P.R. China), Dengfeng Zou (Hohai University, P.R. China), Haijiao An (Tianjin Institute of Metrological Supervision and Testing, P.R. China) .....	4025
<i>Investigation of Reducing End Detent Force in PM Linear Synchronous Motor Using Multi-Unit Technique</i> Jianhui Hu (Harbin Institute of Technology, P.R. China), Fei Liu (University of Harbin Institute of Technology, P.R. China), Yong Li (Harbin Institute of Technology, P.R. China) .....	4030

## Synchronous Machines and Drives (EA)

<i>Design and Implementation of Vehicle Control System for Pure Electric Vehicle Based on AUTOSAR Standard</i> Wang Zhongyuan (Nanjing University of Science and Technology, P.R. China), Yin Dejun (Nanjing University of Science and Technology, P.R. China) .....	4035
<i>Influence of PM wedges in Wound-Rotor Synchronous Starter/Generator</i> Ji Pang (Northwestern Polytechnical University, P.R. China), Weiguo Liu (Northwestern Polytechnic University, P.R. China), Chenghao Sun (Northwestern Polytechnical University, P.R. China), Zhihuang Wei (Northwestern Polytechnical University, P.R. China) .....	4040
<i>Assessment on transient reactive power capability of a grid-connected synchronous Condenser</i> Jianfu Li (ChongQing University & Dongfang Electric Machinery Co., Ltd, P.R. China), Hui Li (Chongqing University, P.R. China), Xiao Wang (Chongqing University, P.R. China), Bin Yuan (Chongqing University, P.R. China), Youbin Zhou (State Grid Hubei Electric Power Company Electric Power Research Institute, P.R. China), Tao Wang (State Grid Hubei Electric Power Company Electric Power Research Institute, P.R. China), Guanghou Zhou (Dongfang Electric Machinery Co., Ltd, P.R. China) .....	4045
<i>Coordinated Control Strategy for Voltage and Frequency Support at Receiving End of an HVDC System</i> Linbo Yu (Xian Jiaotong University, P.R. China) .....	4052
<i>Hybrid Excitation Synchronous Motor Feedback Linearization Decoupling Sliding Mode Control</i> Xuxia Sun (Xi'an University of Technology, P.R. China), Lin Meng (Xi'an University of Technology, P.R. China), Jining Liang (Xi'an University of Technology, Xi'an, Shaanxi Province, P.R. China), Shengmin Li (Xi'an University of Technology, P.R. China) .....	4057
<i>Saturation Characteristic and Reactance of Large Capacity Synchronous Condenser under Different Load</i> Yang Xiao (China Electric Power Research Institute, P.R. China), Zhiqiang Li (China Electric Power Research Institute, P.R. China), Jingdi Zhou (North China Electric Power University, P.R. China), Guorui Xu (North China Electric Power University, P.R. China) .....	4062
<i>A Fault Diagnosis Strategy for Rotor Windings Inter-turn Short Circuit of Synchronous Condenser</i> Chao Wei (State Grid Jiangsu Electric Power Company Limited Research Institute, P.R. China), Yuandi Lin (State Grid Jiangsu Electric Power Company Limited Research Institute, P.R. China), Lei Sun (State Grid Jiangsu Electric Power Company Limited Research Institute, P.R. China), Weijie Tian (Southeast University, P.R. China), Wei Wang (Southeast University, P.R. China), Ming Cheng (Southeast University, P.R. China) .....	4067
<i>Research on the Improvement of Load Capacity of LCI-Fed Synchronous Motor by Constant Commutation Margin Angle Control</i> Zhinan Sha (Harbin Institute of Technology, P.R. China), Jiabao Kou (Harbin Institute of Technology, P.R. China), Qiang Gao (Harbin Institute of Technology (HIT), P.R. China) .....	4072
<i>Comparison of Negative-salient Permanent Magnet Synchronous Machines with Concentrated and Distributed Stator Windings</i> Xiaokun Zhao (School of Electrical Engineering and Automation, Harbin Institute of Technology, P.R. China), Baoquan Kou (Harbin Institute of Technology, P.R. China), Yuansheng Zhao (School of Electrical Engineering and Automation, Harbin Institute of Technology, P.R. China), Feng Xing (Harbin Institute of Technology, P.R. China) .....	4077
<i>Synchronous generator modeling and semi - physical simulation</i> Shiyong Luo (School of Electrical Engineering & Automation, Harbin Institute of Technology, P.R. China), Yu Jian (Harbin Institute of Technology, P.R. China), Qiang Gao (Harbin Institute of Technology (HIT), P.R. China) .....	4083
<i>A Drive Circuit Design Based on SIC MOSFET and analysis of problems</i> Pengfei Li (Beijing Research Institute of Precise Mechatronics and Controls, P.R. China), Guo Xibin (Beijing Research Institute of Precise Mechatronics and Controls, P.R. China), Haiping Zhou (Beijing Research Institute of Precise Mechatronics and Controls, P.R. China), Qing Zhao (Beijing Research Institute of Precise Mechatronics and Controls, P.R. China), Longfei Jia (Beijing Research Institute of Precise Mechatronics and Controls, P.R. China) .....	4089

<i>Sensorless Control of Current-Source-Converters Fed Synchronous Reluctance Motor Drives Using High Frequency Signal Injection</i>	
Zheng Wang (Southeast University, P.R. China), Qiuxiao Song (Southeast University, P.R. China), Pengcheng Liu (Southeast University, P.R. China), Yang Xu (Southeast University, P.R. China), Ming Cheng (Southeast University, P.R. China), Chenxin Tang (Yancheng Institute of New Energy Vehicles of Southeast University, P.R. China)	4094
<i>Fuzzy PI Multi-loop Control of Wound Rotor Synchronous Machine for Aircraft Variable Frequency AC Generation System</i>	
Xiaodong Fan (Nanjing University of Aeronautics and Astronautics, P.R. China), Zhuoran Zhang (Nanjing University of Aeronautics and Astronautics, P.R. China), Jincai Li (Nanjing University of Aeronautics and Astronautics, P.R. China), Yanwu Xu (Nanjing University of Aeronautics and Astronautics, P.R. China), Jianbin Han (Nanjing University of Aeronautics and Astronautics, P.R. China)	4099
<i>Analysis of the Influence of Installing Synchronous Condenser on HVDC Inverter Station to Receiving-End Grid</i>	
Yin Zhaoyang (Harbin University of Science and Technology, P.R. China)	4105
<i>Design of a High-Speed Homopolar Inductor Machine for Flywheel EnergyStorage System</i>	
Xin Tian (Shandong University, P.R. China), Yanliang Xu (Shandong University, P.R. China), Shunhang Wei (Shandong University, P.R. China)	4110
<i>Efficiency Optimization Control Based on Hybrid Excitation Synchronous Motor</i>	
Shengmin Li (Xi'an University of Technology, P.R. China), Jining Liang (Xi'an University of Technology, Xi'an, Shaanxi Province, P.R. China)	4115
<i>Multi-Objective Optimization of Less-Rare-Earth Interior Permanent Magnet Synchronous Machines Used for Electric Vehicles</i>	
Weinan Wang (Harbin Institute of Technology, P.R. China), Mingqiao Wang (Harbin Institute of Technology, P.R. China), Jiayu Guo (Harbin Institute of Technology, P.R. China), Yong Liu (Harbin Institute of Technology, P.R. China), Ping Zheng (Harbin Institute of Technology, P.R. China), Zhenxing Fu (Harbin Institute of Technology, P.R. China)	4121
<i>Influence of Stator End Structures on the End Leakage Magnetic Field for Stator Bars in Large Turbo-generators</i>	
Xu Bian (Harbin University of Science and Technology, P.R. China), Yanping Liang (Harbin University of Science and Technology, P.R. China), Chenguang Wang (Harbin University of Science and Technology, P.R. China), Dongmei Wang (Harbin University of Science and Technology, P.R. China), Lianlian Gao (Harbin University of Science and Technology, P.R. China)	4126
<i>Particle Swarm Optimization with Multiple Regression for Optimal Design of Interior Permanent Magnet Synchronous Motor</i>	
Chan-Ho Kim (Sungkyunkwan University, Korea), Jong-Wook Kim (Dong-A University, Korea), Yong-Jae Kim (Chosun University, Korea), Sang-Yong Jung (Sungkyunkwan University, Korea)	4130
<i>Using DPWM method to improve system efficiency of the machine drive system</i>	
Guangxin Zu (Harbin Institute of Technology, P.R. China)	4134
<i>Prediction Current Compensation Using Adaptive Feedforward Method for Permanent-Magnet Synchronous Motors</i>	
Yongfei LI (Harbin Institute of Technology, P.R. China), Yong Li (Harbin Institute of Technology, P.R. China), Qian Wang (Harbin Institute of Technology, P.R. China), Fei Liu (University of Harbin Institute of Technology, P.R. China), Wangang Tang (Harbin Institute of Technology, P.R. China)	4138

## Reluctance Machines and Drives (FA)

<i>Comparative Researches on Doubly Salient Electro-Magnetic Generator with Semi-Controlled and Full-Controlled Rectification Methods</i>	
Kaimiao Wang (Nanjing University of Aeronautics and Astronautics, P.R. China), Bo Zhou (Nanjing University of Aeronautics and Astronautics, P.R. China), Xingwei Zhou (Hohai University, P.R. China)	4142
<i>Analysis and Design of a Variable Speed Operating Embedded Doubly Salient Electromagnetic Generator for More Electric Aircraft</i>	
Siyuan Jiang (Nanjing University of Aeronautics and Astronautics, P.R. China), Bo Zhou (Nanjing University of Aeronautics and Astronautics, P.R. China), Feng Zhao (Nanjing University of Aeronautics and Astronautics, P.R. China), Kaimiao Wang (Nanjing University of Aeronautics and Astronautics, P.R. China)	4148
<i>Structure Optimization of Switched Reluctance Motor for Torque Ripple Suppression</i>	
Xiao Liu (Hunan University, P.R. China), Zimeng Wang (Hunan University, P.R. China), Dandan Wan (Hunan University, P.R. China), Shoudao Huang (Hunan University, P.R. China)	4153
<i>A SiC MOSFET Inverters Based High Bandwidth Current Control Strategy for DC-biased Vernier Reluctance Machines</i>	
Liang Chang (Huazhong University of Science and Technology, P.R. China), Wenjuan Yu (Central China Branch of State Grid Corporation of China, P.R. China), Zixiang Yu (Huazhong University of Science and Technology, P.R. China), Huida Gao (Huazhong University of Science and Technology, P.R. China), Wubin Kong (Huazhong University & Technology, P.R. China), Ronghai Qu (Huazhong University of Science and Technology, P.R. China)	4159

<i>A Novel Fault diagnosis Method for Power Converter of Doubly Salient Electro-Magnetic Motor</i>	
Xiaobao Feng (Nanjing & Nanjing University of Aeronautics and Astronautics, P.R. China), Bo Zhou (Nanjing University of Aeronautics and Astronautics, P.R. China), Xingwei Zhou (Hohai University, P.R. China), Wenjing Ge (Nanjing University of Aeronautics and Astronautics, P.R. China), Kaimiao Wang (Nanjing University of Aeronautics and Astronautics, P.R. China)	4164
<i>Analysis of a Hybrid Excitation Switched Reluctance Generator Based on Boost Converter</i>	
Kaidi Song (Xi'an Jiaotong University, P.R. China), Wen Ding (Xi'an Jiaotong University, P.R. China), He Bian (Xi'an Jiaotong University, P.R. China), Yangyang Li (Xi'an Jiaotong University, P.R. China)	4169
<i>Modeling and Analysis of Switched Reluctance Machines Using an Improved Conformal Mapping Method</i>	
Zhang Poming (Beihang University, P.R. China), Qishuang Ma (Beijing University of Aeronautics & Astronautics, P.R. China), Ping Xu (Beihang University, P.R. China)	4174
<i>Dynamic Performance Investigation of Doubly Salient Synchronous Reluctance Machines with Current Harmonic Injection</i>	
Kai Zhang (The University of Sheffield, United Kingdom (Great Britain)), Guangjin Li (The University of Sheffield, United Kingdom (Great Britain)), Zi Qiang Zhu (University of Sheffield, United Kingdom (Great Britain)), Geraint Wyn Jewell (University of Sheffield, United Kingdom (Great Britain)), Rui Zhou (The University of Sheffield, United Kingdom (Great Britain))	4178
<i>A New Predictive Torque Control Based on Torque Sharing Function for Switched Reluctance Motors</i>	
Hongyan Hu (Nanjing University of Aeronautics and Astronautics, P.R. China), Xin Cao (Nanjing University of Aeronautics and Astronautics, P.R. China), Ning Yan (Nanjing University of Aeronautics and Astronautics, P.R. China), Zhiquan Deng (Nanjing University of Aeronautics and Astronautics, P.R. China)	4184
<i>The Control Strategy for Integrated Motor-drive and Battery-charging System Based on the Split-field-winding Doubly Salient Electromagnetic Machine in Charging Mode</i>	
Liu Peng (Nanjing University of Aeronautics and Astronautics, P.R. China), Jiadan Wei (Nanjing University of Aeronautics and Astronautics, P.R. China), Li Ming (Nanjing University of Aeronautics and Astronautics, P.R. China), Zhang Taojing (Nanjing University of Aeronautics and Astronautics, P.R. China)	4189
<i>Modified Control Strategy of Delta-connected Three Phase Full-bridge Converter Driving SRM Based on Vector Control</i>	
Zhuangzhi Wang (Hefei University of Technology, P.R. China), Mingyao Ma (Hefei University of Technology, P.R. China), Qingqing Yang (HeFei University of Technology, P.R. China), Shuying Yang (Hefei University of Technology, P.R. China), Xing Zhang (Hefei University of Technology, P.R. China)	4195
<i>A Phase Current Sampling Strategy for Multiphase Switched Reluctance Machines by Pulses Injection and Multi-Frequency Pulse Auxiliary</i>	
Zhiyue Yu (Huazhong University of Science and Technology, P.R. China), Yu Chen (Huazhong University of Science and Technology, P.R. China), Fanyu Meng (Huazhong University of Science and Technology, P.R. China), Chun Gan (Huazhong University of Science and Technology, P.R. China), Ronghai Qu (Huazhong University of Science and Technology, P.R. China)	4201
<i>Design of IE4 Level Synchronous Reluctance Machines with Different Number of Poles</i>	
Shaofeng Jia (Xi'an Jiaotong University, P.R. China), Ping Zhang (Xi'an Jiaotong University, P.R. China), Deliang Liang (Xi'an Jiaotong University, P.R. China), Maocun Dai (Yangzhou Huasheng Motors Manufacturing co., Ltd, P.R. China), Jinjun Liu (Xi'an Jiaotong University, P.R. China)	4206
<i>A Simplified Current Detection Method with Multipulse Injection and Sampling Hold for Five-Phase Switched Reluctance Motor Drives</i>	
Yu Chen (Huazhong University of Science and Technology, P.R. China), Zhiyue Yu (Huazhong University of Science and Technology, P.R. China), Fanyu Meng (Huazhong University of Science and Technology, P.R. China), Ruiqing Gao (Huazhong University of Science and Technology, P.R. China), Chun Gan (Huazhong University of Science and Technology, P.R. China), Ronghai Qu (Huazhong University of Science and Technology, P.R. China)	4211
<i>Design of high-power and high-speed PM assisted synchronous reluctance aero-starter-generator</i>	
Xu He (Beihang University, P.R. China), Hong Guo (Beihang University, P.R. China), Xiaofeng Ding (BeiHang University, P.R. China)	4216
<i>Research on the Effect of Pulse Width Modulation Frequency on Radial Force and Vibration of Switched Reluctance Motor</i>	
Anyu Zhu (Nanjing University of Aeronautics and Astronautics, P.R. China), Peilin Liu (Nanjing University of Aeronautics and Astronautics, P.R. China), Junyue Yu (Nanjing University of Aeronautics and Astronautics, P.R. China), Chuang Liu (Nanjing University of Aeronautics and Astronautics, P.R. China), Kai Wang (Nanjing University of Aeronautics and Astronautics, P.R. China)	4221
<i>Rotor Design to Improve Torque Capability in Synchronous Reluctance Motor</i>	
Hui Yu (Jiangsu University, P.R. China), Xinxing Zhang (Jingjiang College, P.R. China), Jinghua Ji (Jiangsu University, P.R. China), Wenxiang Zhao (University of JiangSu, P.R. China)	4227

<i>Suppression of Torque Ripple of Synchronous Reluctance Motor by Optimizing Air-gap Magnetic Field</i> Xiaopan Liu (ShanDong University, P.R. China), Xiuhe Wang (Shandong University, P.R. China), Wenliang Zhao (Shandong University, P.R. China), Zhang Xin (Shandong University, P.R. China), Bin Wu (State Grid Taian Power Supply Company, P.R. China) .....	4232
<i>Prediction of Torque-Speed Characteristics of 6/4 Variable Flux Reluctance Machine Considering High-Order Harmonics of Flux-linkage</i> Xu Liu (Hebei University of Technology, P.R. China), Jiakuan Bi (Hebei University of Technology, P.R. China), Zi Qiang Zhu (University of Sheffield, United Kingdom (Great Britain)) .....	4237
<i>Torque Observer of SRM Based on BP Neural Network Optimized by Bat Algorithm</i> Lele Han (Dalian Maritime University, P.R. China), Aide Xu (Dalian Maritime University, P.R. China), Jingwei Zhu (Dalian Maritime University, P.R. China), Wen Zhang (Dalian Maritime University, P.R. China) .....	4243
<i>Design and Optimization of Permanent Magnet Assisted Synchronous Reluctance Motor for Better Torque Performance</i> Zhenxing Ji (Hefei University of Technology, P.R. China), Hongmei Li (Hefei University of Technology, P.R. China), Liwen Liu (Hefei University of Technology, P.R. China), Zhiwen Chen (Hefei University of Technology, P.R. China), Tian Yu (Hefei University of Technology, P.R. China), Mingna Ma (HeFei University of Technology, P.R. China) .....	4249
<i>Position Sensorless Control of Switched Reluctance Motor Using State Observer</i> Yoshihiro Nakazawa (National Institute of Technology, Akita College, Japan), Serina Matsunaga (National Institute of Technology, Akita College, Japan) .....	4253

## Linear Machines and Magnetic Levitations (GA)

<i>Traction system research of High-Speed Maglev Train Based on ADRC</i> Zhu Jinqun (University of Chinese Academy of Sciences, P.R. China), Qiongquan Ge (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China) .....	4257
<i>Analysis of Propulsion and Attraction Characteristic of Double-Secondary Permanent Magnet Linear Synchronous Motor for Maglev Train</i> Mutian Zhao (Key Laboratory of Power Electronics and Electric Drive, Institute of Electrical Engineering, CAS & University of Chinese Academy of Sciences, P.R. China), Ruihua Zhang (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Yumei Du (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Qiongquan Ge (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China) .....	4261
<i>Multi-objective optimization of Ironless PMLSM based on Semi-Analytical Model Using Genetic-Particle Swarm Optimization Algorithm</i> Huihuang Wang (Key Laboratory of Power Electronics and Electric Drive, Institute of Electrical Engineering & University of Chinese Academy of Sciences, P.R. China), Yumei Du (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Liming Shi (Institute on Electrical Engineering, Chinese Academy of Sciences, P.R. China), Ruihua Zhang (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China) .....	4268
<i>Research on Improving Thrust Performance by Unequal Teeth Structure in Permanent Magnet Linear Motor</i> Tingting Zhang (School of Electric Engineering, Shenyang University of Technology, P.R. China), Jiefan Cui (School of Electric Engineering, Shenyang University of Technology, P.R. China), Wen Qi Liu (School of Electric Engineering, Shenyang University of Technology, P.R. China), Wenming Tong (Shenyang University of Technology, P.R. China) .....	4273
<i>Electromagnetic Field Analysis and Calculation of Voice Coil Motor with a Concentrated Magnetic Structure</i> Bin Yu (R&D Center of Electric Machine, P.R. China) .....	4278
<i>A Novel Secondary for Reducing Thrust Ripple of Long Primary Double Sided Linear Induction Machine Used in Microgravity Experimental Chamber Launch System</i> Qian Zhang (Beijing Jiaotong University, P.R. China), Huijuan Liu (Beijing Jiaotong University, P.R. China), Jiefang Ma (Beijing Jiaotong University, P.R. China), Yuman Li (Chinese Academy of Sciences, P.R. China) .....	4282
<i>Design Optimization on Secondary and Performance Improvement of Long Primary Double-Sided Linear Induction Motor</i> Peilong Wang (Institute of Electrical Engineering Chinese Academy of Sciences, P.R. China), Liming Shi (Institute on Electrical Engineering, Chinese Academy of Sciences, P.R. China), Ruihua Zhang (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China) .....	4288
<i>Thermal Analysis of Cylindrical Linear Generator with Permanent Magnet taking account of Losses</i> Sungin Jeong (Gwangju University, Korea) .....	4292
<i>Optimal Design of Tubular Linear Reluctance Machine taking account of Leakage Elements</i> Sungin Jeong (Gwangju University, Korea) .....	4297
<i>Research on the Changeover Strategy of Multi-section Long Primary Linear Synchronous Motor for Maglev Vehicle</i> Zhuoyuan Deng (Key Laboratory of Power Electronics and Electric Drive, Institute of Electrical Engineering, CAS & University of Chinese Academy of Sciences, P.R. China), Ke Wang (Chinese Academy of Sciences & Institute of Electrical Engineering, P.R. China), Lu Zhao (Chinese Academy of Sciences, unknown) .....	4302

<i>A Subsection Flux Weakening Scheme Based on Direct Traction Control for Long Primary Permanent Magnet Linear Synchronous Motor</i>	
Mutian Zhao (Key Laboratory of Power Electronics and Electric Drive, Institute of Electrical Engineering, CAS & University of Chinese Academy of Sciences, P.R. China), Ruihua Zhang (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Yumei Du (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Qiongquan Ge (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China)	4307
<i>Model Analysis and Simulation of Traction System for Medium-speed Maglev Traffic with Single-sided Ironless Permanent Magnet Linear Synchronous Motor</i>	
Ruihua Zhang (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Mutian Zhao (Key Laboratory of Power Electronics and Electric Drive, Institute of Electrical Engineering, CAS & University of Chinese Academy of Sciences, P.R. China), Yuhong Liu (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Yumei Du (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Qiongquan Ge (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China)	4312
<i>Performance optimization analysis of PMLSM with new composite magnetic slot wedge</i>	
Zhuli Liu (Henan Polytechnic University, P.R. China), Xudong Wang (Henan Polytechnic University, P.R. China), Baoyu Du (Henan Polytechnic University, P.R. China), Xiaozhuo Xu (Henan Polytechnic University, P.R. China), Shengyang Ji (Henan Polytechnic University, P.R. China), Chi Xiao (Henan Polytechnic University, P.R. China)	4316
<i>Parameters Optimization of the Permanent Magnet Linear Synchronous Machine Using Kriging-based Genetic Algorithm</i>	
Xiao Liu (Hunan University, P.R. China), Xionsong Li (Hunan University, P.R. China), Shoudao Huang (Hunan University, P.R. China)	4320
<i>Position Detection Method of Linear Motor Based on Interactive Multiple Model Cubature Kalman Filter Algorithm</i>	
Shuai Wang (Naval University of Engineering, P.R. China), Xiaocun Guan (Naval University of Engineering, P.R. China), Denghua Guo (Naval University of Engineering, P.R. China), Shaohua Guan (Naval University of Engineering, P.R. China)	4326
<i>Current Ripple Suppression of Permanent Magnet Synchronous Linear Motor Considering the Coupling Effect of d-q Axis</i>	
Jin Liang (Nanjing University of Aeronautics and Astronautics, P.R. China), Xuzhen Huang (Nanjing University of Aeronautics and Astronautics, P.R. China), Zhenyu Qian (Nanjing University of Aeronautics and Astronautics, P.R. China), Yu Hanchuan (Nanjing University of Aeronautics and Astronautics Jiangsu Province, P.R. China)	4331
<i>Sliding Mode Control Based on Linear Quadratic Regulator for an Active Magnetic Bearing Flexible Rotor Virtual Collocated System</i>	
Xiaoxiao Geng (Zhejiang University, P.R. China), Changsheng Zhu (Zhejiang University, P.R. China)	4337
<i>Active Vibration Control of a Non-collocated AMBs Flexible Rotor System to Pass the First Bending Critical Speed</i>	
Peipei Wang (Zhejiang University, P.R. China), Changsheng Zhu (Zhejiang University, P.R. China)	4342
<i>Research and Application of Displacement Detection Technology of Magnetic Bearing</i>	
YuSheng Hu (State Key Laboratory of Air-conditioning Equipment and System Energy Conservation, P.R. China), Weilin Guo (State Key Laboratory of Air-conditioning Equipment and System Energy Conservation, P.R. China), Zijing Zhao (GREE, P.R. China), Yongling He (GREE, P.R. China), Daofu Hu (GREE, P.R. China), Liyi Li (Harbin Institute of Technology (HIT), P.R. China)	4348

## Special Machines and Actuators (HA)

<i>Analysis and Design of a Novel Asymmetrical Bistable Stator Protruding Type Permanent Magnet Actuator</i>	
Guanbao Zeng (South China University of Technology & School of Electric Power, P.R. China), Xiangyu Yang (South China University of Technology, P.R. China), Huajie Yin (South China University of Technology, P.R. China), Yiyang Jing (South China University of Technology, P.R. China), Shiwei Zhao (South China University Of Technology, P.R. China), Jianghua Cao (South China University of Technology, P.R. China), Jiaxin Zhao (South China University of Technology, P.R. China)	4354
<i>Research on Direct Drive Operation Mechanism of 126kV High-voltage Vacuum Circuit Breaker</i>	
Xiao Wang (Naval University of Engineering, P.R. China), Yougui Guo (Xiangtan University, P.R. China), Xi Xiao (Tsinghua University, P.R. China), Yulong Huang (Tsinghua University, P.R. China), Yuan Deng (Ping Gao Group Co., Ltd, P.R. China), Qiongqiong Liu (Ping Gao Group Co., Ltd., P.R. China)	4360
<i>Torque Characteristic Analysis of a Novel Brushless Dual Rotor Machine for Hybrid Electric Vehicles</i>	
Xiaowei Ju (Harbin Institute of Technology, P.R. China), Yuan Cheng (Harbin Institute of Technology, P.R. China), Tianxu Zhao (Harbin Institute of Technology, P.R. China), Shumei Cui (Harbin Institute of Technology, P.R. China)	4365
<i>Optimization of Absolute Variable Reluctance Resolver with Taguchi and FEM</i>	
Chao Bi (University of Shanghai for Science and Technology & China, P.R. China), LongFei Xiao (University of Shanghai for Science and Technology, P.R. China)	4371



<i>Linear Impact Generator for Automated Dataset Acquisition of Elastic Waves in Haptic Surfaces</i> Camilo Hernandez (EPFL, Switzerland), Jérémy Jayet (EPFL, Switzerland), Paolo Germano (EPFL, Switzerland), Adrien Thabuis (Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland), Yves Perriard (Laboratory director, Switzerland) .....	4377
<i>Design and Comparative Analysis of Consequent Pole Rotor Configurations in PM Vernier Motors for In-wheel Drive Application</i> Yanlei Yu (Harbin Institute of Technology, P.R. China), Yulong Pei (Harbin Institute of Technology (HIT), P.R. China), Lei Chen (Harbin Institute of Technology, P.R. China), Feng Chai (Harbin Institute of Technology, P.R. China), Guangxian Han (Shanghai AMP MOONS' Automation CO., LTD, P.R. China) .....	4382
<i>Design of a novel limited angle torque motor with compound Halbach array for electric direct-drive servo system in aerospace vehicles</i> Xinhua Zhang (Beijing Institute of Automatic Control Equipment, P.R. China), Tianyi Wang (Beijing Institute of Automatic Control Equipment, P.R. China), Jian Huang (Beijing Institute of Automatic Control Equipment, P.R. China), Guan Wang (Beijing Institute of Automatic Control Equipment, P.R. China), Zhiyi Song (Beijing Institute of Automatic Control Equipment, P.R. China) .....	4388
<i>Effect of Transmitter Position on the Torque Generation of a Magnetic Resonance Based Motoring system</i> Matthias Vandeputte (Ghent University, Belgium), Luc Dupré (Ghent University, Belgium), Guillaume Crevecoeur (Ghent University, Belgium) .....	4394
<i>A Single-Side Disc Motor with Independent Controllable Excitation Magnetic Poles for Wind Turbine Yaw System</i> Shigui Zhou (Qufu Normal University, P.R. China), Bin Cai (Qufu Normal University, P.R. China), Xiaoguang Chu (Qufu Normal University, P.R. China), Wenfei Zhao (Qufu Normal University, P.R. China), Lei Huang (Southeast University, P.R. China) .....	4399
<i>Improved Analytical Model for Flux-linkage Calculation of a Direct Drive Electromechanical Actuator with Rotor Eccentricity</i> Yun Long (State Key Laboratory of Electrical Insulation and Power Equipment, P.R. China), Jinhua Du (State Key Laboratory of Electrical Insulation and Power Equipment, P.R. China), Shangbin Yuan (State Key Laboratory of Electrical Insulation and Power Equipment, P.R. China) .....	4403
<i>Design of Novel Variable Reluctance Resolver with Outer Rotor</i> Shuxin Nie (Qingdao University, P.R. China), Ronggang Ni (Qingdao University, P.R. China), Yawei Wu (Qingdao University, P.R. China), Jingze Li (Qingdao University, P.R. China), Ji Chen (CPEEC First Thermal Power Company, P.R. China) .....	4409
<i>Structural Optimization Design of Liquid Suspension Spherical Motor Based on Thermal Characteristic Analysis</i> Zheng Li (Hebei University of Science and Technology, P.R. China), Feihong Yue (Hebei University of Science and Technology, P.R. China) .....	4413
<i>The Electromagnetic and Thermal Analysis of an Air-Core Pulsed Alternator Driving the Railgun</i> Yu Kexun (Huazhong University of Science and Technology, P.R. China), Huijie Duan (Huazhong University of Science and Technology, P.R. China), Xianfei Xie (Huazhong University of Science and Technology, P.R. China) .....	4419
<i>Calculation and Analysis on Characteristics of the Magnetic Lead Screw</i> Yuxing Liu (Hunan University, P.R. China), Qifeng Bian (State Grid Zhejiang Electric Power Co., LTD., P.R. China), Huali Xia (State Grid Zhejiang Electric Power Co., LTD., P.R. China), Xiao Liu (Hunan University, P.R. China), Meng Lu (Hunan University, P.R. China) .....	4425
<i>Structural Design and FEA of a New Type of Multi-DOF Spherical Induction Motor without Output Shaft</i> Hengyu Zhou (Zhejiang University, P.R. China) .....	4430
<i>Performance Comparison of Vernier Hybrid Machine with Different PM Distribution</i> Yubo Yang (Shandong University, P.R. China), Jian Chen (Shandong University, P.R. China), Changqing Zhu (Shandong University, P.R. China), Xiuhe Wang (Shandong University, P.R. China) .....	4437
<i>Design and Analysis of a Novel Multi-DOF PM Spherical Motor</i> Feng Chai (Harbin Institute of Technology, P.R. China), Lei Gan (Harbin Institute of Technology, P.R. China), Yulong Pei (Harbin Institute of Technology (HIT), P.R. China), Lin Yuan (Shanghai AMP&MOONS' Automation CO., LTD., P.R. China) .....	4442
<i>Improved Two Phases Stator Wound-Field Flux-Switching Machines with Overlapping Windings</i> Wen Jiang (Nanjing University of Aeronautics and Astronautics, P.R. China), Wenxin Huang (Nanjing University of Aeronautics and Astronautics, P.R. China), Xiaogang Lin (Nanjing University of Aeronautics and Astronautics, P.R. China), Yong Zhao (Nanjing University of Aeronautics and Astronautics, P.R. China), Dingfeng Dong (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	4448
<i>Analysis of Flux Regulation Principle in a Novel Hybrid-Magnet-Circuit Variable Flux Memory Machine</i> Hui Yang (Southeast University, P.R. China), Hao Zheng (Southeast University, P.R. China), Shukang Lyu (Southeast University, P.R. China), Heyun Lin (Southeast University, P.R. China), Zi Qiang Zhu (University of Sheffield, United Kingdom (Great Britain)), Weinong Fu (The Hong Kong Polytechnic University, P.R. China) .....	4453

<i>Theoretical Analysis and Comparative Study of Contact Permanent Magnet Locking Mechanisms Used in Aerospace</i> JianFei Sun (Harbin Institute of Technology, P.R. China), Yong Li (Harbin Institute of Technology, P.R. China), Qian Wang (Harbin Institute of Technology, P.R. China), Pengcheng MA (Harbin Institute of Technology, P.R. China) .....	4459
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------

## Transformers (IA)

<i>Simulation Analysis of Temperature Distribution of Oil-immersed Self-cooled Transformer under Different Environmental Conditions</i> Hualin Shi (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China) .....	4464
<i>A Contactless Power Transfer Device Applied to the CT System</i> Jichang Yang (Huazhong University of Science and Technology, P.R. China), Yuanzhi Zhang (Huazhong University of Science and Technology, P.R. China), Dong Jiang (Huazhong University of Science and Technology, P.R. China) .....	4468
<i>A Magnetic Flux Compensated Series Active Power Filter using Deadbeat Control based on Repetitive Predictor Theory</i> Xianfeng Chen (Huizhou Power Supply Bureau, Guangdong Power Grid Corporation, P.R. China), Tingkang Wang (School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, P.R. China), Haifei Wang (Huazhong University of Science and Technology, P.R. China), Yuning Hou (Huazhong University of Science and Technology, P.R. China), Lin Guo (Huizhou Power Supply Bureau, Guangdong Power Grid Corporation, P.R. China) .....	4473
<i>Research on Overload Capability of Dry Distribution Transformer Based on Hot Spot Temperature Model</i> Haifei Wang (Huazhong University of Science and Technology, P.R. China), Tingkang Wang (School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, P.R. China), MY Xue (Huazhong University of Science and Technology, P.R. China), Jianming Sun (China Railway Fourth Survey and Design Institute Group Company Limited, P.R. China), Wei Xiong (China Railway Fourth Survey and Design Institute Group Company Limited, P.R. China), Yuning Hou (Huazhong University of Science and Technology, P.R. China) .....	4478
<i>Transformer Fault Simulation and Analysis Based on Fractional Calculus</i> Xue Li (Shandong University, P.R. China), Hui Zhong (Shandong University, P.R. China), Hao Liu (State Grid Binzhou Power Supply Company, P.R. China), Yuanyuan Sun (Shandong University, Canada), Ankang Chen (Shandong University, P.R. China), Dongwei Qiao (State Grid Taian Power Supply Company, P.R. China) .....	4483
<i>Analysis of decreasing resistance to short circuit impact under dc bias of transformer</i> Qiu Hong (Guangzhou Power Supply Bureau Limited, P.R. China), Lifeng Zhang (Shanghai University of Electric Power, P.R. China) .....	4488
<i>Pre-Breakdown Characteristics in Transformer Oil under Bipolar Oscillating Impulse Voltage</i> Can Ding (China Three Gorges University, P.R. China), Tiancheng Tu (China Three Gorges University, P.R. China), Chunhua Fang (China Three Gorges University, P.R. China), Fating Yuan (China Three Gorges University, P.R. China), Chengxi Li (China Three Gorges University, P.R. China) .....	4493
<i>Research on Fault Identification Method of Dry-type Transformers Based on Support Vector Machine</i> Ling Ji (Southeast University, P.R. China), Kunpeng Li (Guangzhou Metro Design & Research Institution Co. Ltd, P.R. China), Zhang Pengfei (Guangzhou Metro Design & Research Institution Co. Ltd, P.R. China), Bao Liwen (Southeast University, P.R. China), Yunkai Huang (Southeast University, P.R. China) .....	4497
<i>High-Impedance Transformer Parameter Determination Method for Limiting Short-Circuit Current of Power System</i> Binson Liu (North China Electric Power University, P.R. China) .....	4503
<i>Planning of Solid State Transformer Considering Multiple Connection Modes and Control Methods for the Hybrid AC/DC Distribution Network</i> Jiyang Shi (Tianjin University, P.R. China), Wen Qiao (Tianjin University, P.R. China), Fei Xue (Ningxia Electric Power Limited Company, P.R. China), Li Ma (State Grid Tianjin Electric Power Company, P.R. China), Wenjing Yang (Tianjin University, P.R. China), Ting Yang (Tianjin University, P.R. China) .....	4508
<i>Winding Design and Control method of A Novel Quick Response Magnetic-valve Controllable Reactor</i> Pei Jing (Lanzhou Jiaotong University, P.R. China), Mingxing Tian (Lanzhou Jiaotong University, P.R. China), Huiying Zhang (Lanzhou Jiaotong University, P.R. China) .....	4514
<i>Simulation Analysis and Experiment Validation of Vibration and Noise of Oil-immersed Transformer</i> Fenggang Yang (Shenyang University of Technology, P.R. China), Ziyang Ren (Shenyang University of Technology, P.R. China), Dianhai Zhang (Shenyang University of Technology, P.R. China), Xiaopeng Fan (Electric Power Research Institute of Guangdong Power Grid, P.R. China), Li Li (Electric Power Research Institute of Guangdong Power Grid, P.R. China), Yongyan Zhou (Electric Power Research Institute of Guangdong Power Grid, P.R. China) .....	4519
<i>Multi-physics Coupling Analysis of Vibration and Noise of Dry-type Distribution Transformer Core</i> Xiaoshuo Fu (Shenyang University of Technology, P.R. China), Yanli Zhang (Shenyang University of Technology, P.R. China), Dianhai Zhang (Shenyang University of Technology, P.R. China), Li Li (Electric Power Research Institute of Guangdong Power Grid, P.R. China), Xiaopeng Fan (Electric Power Research Institute of Guangdong Power Grid, P.R. China), Yongyan Zhou (Electric Power Research Institute of Guangdong Power Grid, P.R. China) .....	4524

<i>Optimum Design of High Frequency Transformer Based on Winding Spacing</i> Zhiran Peng (Naval University of Engineering, P.R. China), Guangsen Wang (Naval University of Engineering, P.R. China), Xiaofei Zhai (Naval University of Engineering, P.R. China), Xiao Zhang (Naval University of Engineering, P.R. China), Hao Zhou (Naval University of Engineering, P.R. China), Chenglin Yi (Daqo Kaifan Electric co., P.R. China) .....	4529
<i>Study on Stray-field loss of Magnetic Shields under AC-DC Hybrid Excitation</i> Qingyi Kong (Army Engineering University & Hebei Jiaotong Vocational and Technical College, P.R. China) .....	4535
<i>Studies on the Building Factor of Transformers Based on laminated Core Models</i> Rong Ye (Hebei Jiaotong Vocational and Technical College, P.R. China) .....	4540
<i>Characterization of the Optimized High Frequency Transformer Using Nanocrystalline and Amorphous Magnetic Materials</i> Mahbubur Rahman Kiran (Ahsanullah University of Science and Technology, Bangladesh), Omar Farrok (Ahsanullah University of Science and Technology, Bangladesh), Md. Rabiul Islam (University of Wollongong, Australia), Jian Guo Zhu (University of Sydney & University of Technology Sydney, Australia) .....	4545
<i>A Study on Stray Loss Calculation in Power Transformer using Impedance Boundary Condition</i> Keun-Ho Park (University of Dong-A, Korea), Hyun-Mo Ahn (Hyosung Corporation, Korea), Sung Chin Hahn (Dong-A University, unknown) .....	4549
<i>Comparison between Thermal-Circuit Model and Finite Element Model for Dry-Type Transformer</i> Yifan Chen (Hebei University of Technology, P.R. China), Changgeng Zhang (Hebei University of Technology, P.R. China), Yongjian Li (Hebei University of Technology, P.R. China), Zhiwei Zhang (The Ohio State University, USA), Wenliang Ying (TBEA Tianjin Transformers Company Ltd, P.R. China), Qingxin Yang (Tianjin University of Technology, P.R. China) .....	4554
<i>Design and Implementation of a 150kW High Frequency Transformer in High voltage Large Power Solid State Transformer Consist of Multi-DABs</i> Jinping He (Science and Technology on Ship Integrated Power System Technology Laboratory, Wuhan, P.R. China), Kai Ji (Wuhan Institute of Marine Electric Propulsion, P.R. China), Nianzhou Liu (National Key Lab. of Science and Technology on Vessel Integrated Power System, P.R. China), Derong Lin (Science and Technology on Ship Integrated Power System Technology Laboratory, P.R. China) .....	4559
<i>Inductance Characteristics of the High-Frequency Transformer in Dual Active Bridge Converters</i> Xinyang Li (Tsinghua University, P.R. China), Weican Huang (Tsinghua University, P.R. China), Bin Cui (Tsinghua University, P.R. China), Xiaohua Jiang (Tsinghua University, P.R. China) .....	4565
<i>A Low-Level Turn-to-Turn Fault Protection Scheme for Magnetically Controlled Shunt Reactor</i> Muhammad Asghar Khan (North China Electric Power University & COMSATS University Islamabad, Abbottabad Campus, P.R. China), Tao Zheng (North China Electric Power University, P.R. China), Liu Xiaoxiao (North China Electric Power University, P.R. China), Junqi Wei (North China Electric Power University, P.R. China) .....	4570

## SS: Direct Drive and Magnetic Levitation Technologies (1-1)

<i>Sliding Mode Speed Regulation of Linear Induction Motors Based on Direct Thrust Control with Space-Vector Modulation Strategy</i> Mosaad Ali (Huazhong University of Science and Technology, Wuhan & Kafrelshiekh University, Faculty of Engineering, P.R. China), Wei Xu (Huazhong University of Science and Technology, Wuhan, P.R. China), Mahmoud F. Elmorshedy (Huazhong University of Science and Technology, Wuhan, P.R. China & Faculty of Engineering, Tanta University, Egypt), Yi Liu (Huazhong University of Science and Technology, P.R. China) .....	4576
<i>Fault-Tolerant Predictive Model Control for Five-Phase PM Motor With Optimal Duty Modulation Strategy</i> Wenxiang Zhao (University of JiangSu, P.R. China) .....	4582
<i>Research on Emergency Braking Strategy of Driverless Vehicle Based on Overload Optimization Control</i> Yingquan Liu (Naval University of Engineering, P.R. China), Junyong Lu (Naval University of Engineering, P.R. China), Xinlin Long (Naval University of Engineering, P.R. China) .....	4587
<i>Performance Investigation of a Novel Double-layer Winding Ironless Linear Synchronous Machine with Quasi-Halbach Magnets</i> Zhedong Xie (Zhejiang University, P.R. China), Jiuding Zhang (Zhejiang University, P.R. China), Weihu Mei (Zhejiang University, P.R. China), Qinfen Lu (Zhejiang University, P.R. China) .....	4594
<i>Investigation on A New Double-sided Permanent Magnet Linear Switched Reluctance Motor</i> Ruiwu Cao (Nanjing University of Aeronautics and Astronautics & College of Automation Engineering, P.R. China), Danni Shen (Nanjing University of Aeronautics and Astronautics, P.R. China), Minghang Lu (Nanjing University of Aeronautics and Astronautics, P.R. China), Enchao Su (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	4600

## SS: Wireless Power Transfer (2-1)

<i>Design of wireless power supply system for trackless trolley car</i> Xiyou Chen (Dalian University of Technology, P.R. China), Shoupeng Han (Dalian University of Technology, P.R. China), Maopeng Wu (Dalian University of Technology, P.R. China) .....	4606
<i>A Multi-load Wireless Power Transfer System with Constant Voltage Outputs Using S-LCC Compensation</i> Zhe Zhou (Global Energy Interconnection Research Institute, P.R. China), Qiuyu Shi (Global Energy Interconnection Research Institute, P.R. China), Chenwen Cheng (San Diego State University, USA), Weiguo Li (State Grid Corporation of China, Global Energy Interconnection Research Institute, P.R. China), Zhanfeng Deng (Global Energy Interconnection Research Institute, P.R. China), Fangyi Li (Global Energy Interconnection Research Institute, P.R. China), Chris Mi (San Diego State University, USA) .....	4612
<i>A Closed-loop Ultrasonic Power Transfer System with Constant Output Voltage</i> Maopeng Wu (Dalian University of Technology, P.R. China), Xiyou Chen (Dalian University of Technology, P.R. China), Lijuan Su (Dalian University of Technology, P.R. China), Chen Qi (Dalian University of Technology, P.R. China), Xianmin Mu (Dalian University of Technology, P.R. China), Shoupeng Han (Dalian University of Technology, P.R. China) .....	4618
<i>Interoperability Evaluation of Wireless EV Charging Systems Using Coil Ampere-Turns</i> Kai Song (Harbin Institute of Technology, P.R. China), Ruizhi Wei (Harbin Institute of Technology, P.R. China), Hang Zhang (Harbin Institute of Technology, P.R. China), Xiaohua Huang (China Electric Power Research Institute, P.R. China), Hailong Zhang (State Grid Hebei Electric Power Supply Co., Ltd, P.R. China), Guang Yang (Harbin Institute of Technology, P.R. China), Rengui Lu (Harbin Institute of Technology, P.R. China), Bin Wei (Chinese Electric Power Research Institute, P.R. China), Chunbo Zhu (Harbin Institute of Technology, P.R. China) .....	4623
<i>A Variable Frequency Control (VFC)-based WPT System Featuring Constant Voltage Output, Less Power Stages, and Lower System Costs</i> Yousu Yao (Harbin Institute of Technology, P.R. China), Yijie Wang (Harbin Institute of Technology, P.R. China), Haisong Cheng (Harbin Institute of Technology, P.R. China), Kaixing Lu (Harbin Institute of Technology, P.R. China), Yueshi Guan (Harbin Institute of Technology, P.R. China), Shanshan Gao (Harbin Institute of Technology, P.R. China), Xiaosheng Liu (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China) .....	4627
<i>Optimal Design of DD Coupling Coil for Wireless Charging System of Electric Vehicle</i> Yu Guo (Harbin Institute of Technology, P.R. China), Shuai Dong (Harbin Institute of Technology, P.R. China), Kai Song (Harbin Institute of Technology, P.R. China), Xiaohua Huang (China Electric Power Research Institute, P.R. China), Qian Zhang (State Grid Beijing Power Research Institute, P.R. China), Weimei Ge (Harbin Institute of Technology, P.R. China), Rengui Lu (Harbin Institute of Technology, P.R. China), Guo Wei (Harbin Institute of Technology, P.R. China), Chunbo Zhu (Harbin Institute of Technology, P.R. China) .....	4632

## Magnetics and Field Analysis (2-1)

<i>Dynamic Modeling of the Magnetic Properties of Grain-Oriented Electrical Steel under Harmonic Excitation</i> Ruiying Chen (Hebei University of Technology, P.R. China), Yongjian Li (Hebei University of Technology, P.R. China), Zhiguang Cheng (Hebei Provincial Key Laboratory of Electromagnetic, P.R. China), Changgeng Zhang (Hebei University of Technology, P.R. China), Lanrong Liu (Hebei Provincial Key Laboratory of Electromagnetic, P.R. China) .....	4636
<i>Electromagnetic Torque Synthesis From Air-gap Magnetic Field Harmonic for Permanent Magnet Vernier Motor</i> Guidan Li (Tianjin University, P.R. China), Yiming Xu (Tianjin University, P.R. China), Bin Li (Tianjin University, P.R. China), Hongfeng Li (Tianjin University, P.R. China) .....	4641
<i>Effect of Demagnetization fault on Electromagnetic Field and Related Parameters in Permanent magnet Wind Generator</i> Wei Li Li (Beijing Jiaotong University, P.R. China), Mei Wei Zhang (Beijing Jiaotong University, P.R. China), Xiang Zhao (Beijing Jiaotong University, P.R. China), Yu Shen (Beijing Jiaotong University, P.R. China) .....	4646
<i>A Mutual-Inductance-Based Impedance Model of Induction Cooker for Efficiency Improvement</i> Zhibin Li (Nanjing University of Aeronautics and Astronautics, P.R. China), Qianhong Chen (Nanjing University of Aeronautics & Astronautics, P.R. China), Shuai Zhang (Nanjing University of Aeronautics and Astronautics, P.R. China), Xiaoyong Ren (Nanjing University of Aeronautics & Astronautics, P.R. China), Zhiliang Zhang (Nanjing University of Aeronautics & Astronautics, P.R. China) .....	4653
<i>Research of Non-sinusoidal Effects on Core Loss in Soft Magnetic Composite Materials Based on Three-Dimensional Magnetic Test System</i> He Sun (Hebei University of Technology, P.R. China), Yongjian Li (Hebei University of Technology, P.R. China), Xinran Yu (Hebei University of Technology, P.R. China), Shuaichao Yue (Hebei University of Technology, P.R. China), Ming Yang (Hebei University of Technology, P.R. China) .....	4658

<i>Analytical Modeling and Optimization of a Permanent Magnet Machine With Two-Segment Bread-Loaf Magnets</i> Youyuan Ni (Hefei University of Technology, P.R. China), Zhiwei Liu (Hefei University of Technology, P.R. China), Xin Jiang (Hefei University of Technology, P.R. China) .....	4663
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------

## Renewable Energy Systems (4-3)

<i>Large Signal Stability analysis of Hybrid AC/DC microgrid Based on T-S fuzzy model method</i> Xiaoxi Sun (North China University of Technology, P.R. China), Xinbo Liu (North China University of Technology, P.R. China) .....	4668
<i>Multi-objective Optimization for DFIG Based Wind Energy Conversion System by using NSGA-II</i> Fei Lu (Bundeswehr University Munich, Germany), Dieter Gerling (University of Federal Defence Munich, Germany) .....	4674
<i>An Energy Management Method for a Microgrid Group Considering Uncertainty Models</i> Lingling Tan (Harbin Institute of Technology, P.R. China), Panbao Wang (Harbin Institute of Technology, P.R. China), Xiaochen Zhang (Harbin Institute of Technology, P.R. China), Wang Wei (Harbin Institute of Technology, P.R. China) .....	4680
<i>Steady-state Characteristics of a Series LCC HVDC System with Power Compensators for Wind Farms</i> Ken-ichiro Yamashita (Salesian Polytechnic, Japan), Gai Tsukamoto (Salesian Polytechnic, unknown) .....	4686
<i>SOC-featured Distributed Tertiary Control for Energy Management in DC Microgrid Clusters</i> Chuqing Wu (Nanjing University of Aeronautics and Astronautics, P.R. China), Xiaolei Hou (Nari Technology Development CO. , Ltd, P.R. China), Yu Wang (Nanjing University of Aeronautics and Astronautics, P.R. China), Xin Chen (Nanjing University of Aeronautics and Astronautics, P.R. China), Chendong Liao (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	4690
<i>A Bus Voltage Regulation Strategy without Communication for Improving Efficiency of Photovoltaic Series-Connected Power Optimizer System</i> Yonghao Li (Zhejiang University & College of Electrical Engineering, P.R. China), Jizhi Qi (Zhejiang University, P.R. China), Yutai Fu (Zhejiang University, P.R. China), Min Chen (Zhejiang University, P.R. China), Xinghua Zhang (Zhejiang University, P.R. China) .....	4694

## Reliability and Diagnostics (2-1)

<i>Partial Discharge Characteristics of Electrical Treeing in XLPE insulation utilizing Multi Level PWM Waveforms</i> Thomas Hammarstroem (Chalmers University Of Technology, Sweden) .....	4699
<i>Insulation Capacitance as Diagnostic Marker for Thermally Aged, Low Voltage Electrical Machines</i> Vincenzo Madonna (University of Nottingham, United Kingdom (Great Britain)), Paolo Giangrande (University of Nottingham, United Kingdom (Great Britain)), Weiduo Zhao (University of Nottingham Ningbo China, P.R. China), Yinli Wang (University of Nottingham Ningbo China, P.R. China), He Zhang (University of Nottingham Ningbo China, P.R. China), Michael Galea (University of Nottingham Ningbo China & University of Nottingham, P.R. China) .....	4705
<i>Research on the instantaneous temperature rise prediction of continuous electromagnetic launch guide rail based on data-driven technology</i> Delin Zeng (Naval University of Engineering, P.R. China), Junyong Lu (Naval University of Engineering, P.R. China) .....	4710
<i>Online Inverter Open-circuit Fault Diagnosis for Fault Tolerant Permanent Magnet Synchronous Motor System under multi-fault condition</i> Xinlei Tian (Beihang University, P.R. China), Hong Guo (Beihang University, P.R. China), Jinquan Xu (Beihang University, unknown), Lumi Liu (Beijing Institute of Control Engineering, P.R. China) .....	4717
<i>A Novel On-line IGBT Junction Temperature Measurement Method Based on On-state Voltage Drop</i> Yanyong Yang (Tsinghua University, P.R. China), Qinghao Zhang (Tsinghua University, P.R. China), Pinjia Zhang (Tsinghua University, P.R. China) .....	4722
<i>Speed Dependency of the Induction Machine Phase Current Spectrum under Fault Conditions</i> Stefan Quabeck (RWTH Aachen University, Germany), Daniel Scharfenstein (RWTH Aachen University, Germany), Rik De Doncker (RWTH Aachen, Germany) .....	4728

## Permanent-Magnet Motors and Drives (14-7)

<i>Research on Symmetrical Six-Phase PMSM Two-Motor Inversed-Series Connection System</i> Xu Sun (Naval Aviation University, P.R. China), Lingshun Liu (Naval Aviation University, P.R. China), Hongguang Yan (Naval Aviation University, P.R. China) .....	4734
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------

<i>Fault Tolerant Operation of Motor Drive Fed by Dual Inverter Focusing on DC-Bus Battery Failure</i>	
Yoshiaki Oto (Shizuoka University, Japan), Toshihiko Noguchi (Shizuoka University, Japan)	4740
<i>Winding and Electromagnetic Analysis for 39-Slot/12-Pole Frameless Permanent Magnet Synchronous Motor</i>	
Yiguang Chen (Tianjin University, P.R. China), Weijie Hao (Tianjin University, P.R. China), Yukai Yang (Tianjin University, P.R. China), Lili Kang (Tianjin University, P.R. China), Qing Zhang (Tianjin University, P.R. China)	4746
<i>Multi-physics Field Analysis of Traction PMSM for Shunting Locomotive</i>	
Lili Kang (Tianjin University, P.R. China), Yiguang Chen (Tianjin University, P.R. China), Weijie Hao (Tianjin University, P.R. China), Yukai Yang (Tianjin University, P.R. China), Qing Zhang (Tianjin University, P.R. China)	4752
<i>Advanced measurement technologies for soft and hard magnetic materials used in automotive applications</i>	
Lukasz Mierczak (Brockhaus Measurements, Germany)	4758

## Permanent-Magnet Motors and Drives (14-8)

<i>Fast and Accurate Multiphysics Model for Optimization-based Design of Fractional-Slot PM Machines</i>	
Benjamin Cheong (University of Nottingham, United Kingdom (Great Britain)), Paolo Giangrande (University of Nottingham, United Kingdom (Great Britain)), Xiaochen Zhang (Beijing Jiaotong University, P.R. China & The University of Nottingham, United Kingdom (Great Britain)), Michael Galea (University of Nottingham Ningbo China & University of Nottingham, P.R. China), Pericle Zanchetta (University of Nottingham, United Kingdom (Great Britain)), Patrick Wheeler (University of Nottingham, United Kingdom (Great Britain))	4763
<i>Comparison of Magnetically Geared and Surface-mounted PM machines - Influence of Machine Size and Current Density</i>	
Huayang Li (The University of Sheffield, United Kingdom (Great Britain)), Zi Qiang Zhu (University of Sheffield, United Kingdom (Great Britain)), Geraint Wyn Jewell (University of Sheffield, United Kingdom (Great Britain)), Paul Smeeton (Rolls-Royce plc, United Kingdom (Great Britain)), Ellis Chong (Rolls-Royce plc, United Kingdom (Great Britain)), Brian Simmers (Rolls-Royce plc, United Kingdom (Great Britain))	4769
<i>5-phase double winding PMSM with integrated SiC inverter for In-Wheel Motor</i>	
Keita Fukuda (Shibaura Institute of Technology, Japan), Kan Akatsu (Shibaura Institute of Technology, Japan)	4775
<i>Design Method of Capacitor Network for Interior Permanent Magnet Synchronous Machine Drive</i>	
Hyeon-gyu Choi (Seoul National University, Korea), Jung-Ik Ha (Seoul Nat'l University, Korea)	4780
<i>Robust Speed Control of PMSM with Nonlinear Position Observer</i>	
Peda Medagam (Phase Technologies LLC & Phase Technologies LLC, USA), Jack Y Yang (South Dakota School of Mines and Technology (SDSM&T) & Phase Technologies LLC, USA)	4785
<i>Design of Full-order Observer for PMSM Based on Current Prediction Model</i>	
Yunsong Li (University of Institute, P.R. China), Ming Yang (Harbin Institute of Technology, P.R. China), Jiang Long (Harbin Institute of Technology, P.R. China), Ren Boyang (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China)	4789

## Permanent-Magnet Motors and Drives (14-9)

<i>Performance Analysis of Frameless Motors for Robots</i>	
Guo Xibin (Beijing Research Institute of Precise Mechatronics and Controls, P.R. China), Wenming Tong (Shenyang University of Technology, P.R. China), Pengfei Li (Beijing Research Institute of Precise Mechatronics and Controls, P.R. China), Qing Zhao (Beijing Research Institute of Precise Mechatronics and Controls, P.R. China), Jigui Zheng (Beijing Research Institute of Precise Mechatronic Controls, P.R. China)	4794
<i>Torque Boost Operation of New Consequent-Pole Permanent Magnet Motor Using Zero-Phase Circuit</i>	
Toshihiko Noguchi (Shizuoka University, Japan), Kazuhiro Murakami (Shizuoka, University, Japan)	4798
<i>A Universal Discrete Space Vector Modulation Based Model Predictive Control for PMSM Drives</i>	
Yongchang Zhang (North China University of Technology, P.R. China), Hao Jiang (North China University of Technology, P.R. China), Haitao Yang (North China University of Technology, P.R. China)	4804
<i>Electrical and Mechanical Compatible Design of 15 kW, 150,000 r/min Ultra-High-Speed PM Motor</i>	
Toshihiko Noguchi (Shizuoka University, Japan), Kohei Fujita (Shizuoka University & Noguchi Laboratory, Japan)	4810
<i>Model-Free Predictive Current Control of PMSM Drives Based on Ultra-Local Model</i>	
Yongchang Zhang (North China University of Technology, P.R. China), Jialin Jin (North China University of Technology, P.R. China), Lanlan Huang (North China University of Technology, P.R. China), Wei Xu (Huazhong University of Science and Technology, P.R. China), Yi Liu (Huazhong University of Science and Technology, P.R. China)	4816

<i>Restarting a Free-running PMSM without Position Sensor Based on Predictive Current Control</i>	
Haitao Yang (North China University of Technology, P.R. China), Yongchang Zhang (North China University of Technology, P.R. China) .....	4821

## Power converters (8-5)

<i>Relationship between Finite Control Set Model Predictive Control and Direct Current Control with Duty Ratio Optimization for Power Converters</i>	
Yongchang Zhang (North China University of Technology, P.R. China), Xiang Liu (North China University of Technology, P.R. China), Haitao Yang (North China University of Technology, P.R. China) .....	4826
<i>Online Inductance Identification of PWM Rectifier under Unbalanced and Distorted Network Conditions</i>	
Yongchang Zhang (North China University of Technology, P.R. China), Bingyu Li (North China University of Technology, P.R. China), Jie Liu (North China University of Technology, P.R. China) .....	4832
<i>Active Power Decoupling Design of AC-DC Converter for On-board Chargers</i>	
Mingjie Qiu (Tianjin University, P.R. China), Ping Wang (Tianjin University, P.R. China), Huakun Bi (Tianjin University, P.R. China), Zhishuang Wang (Tianjin University, P.R. China) .....	4838
<i>A Novel Stacked High Step-down DC-DC Converter</i>	
Yueshi Guan (Harbin Institute of Technology, P.R. China), Heng Chen (Harbin Institute of Technology, P.R. China), Fang Li (HIT, P.R. China), Shanshan Gao (Harbin Institute of Technology, P.R. China), Yousu Yao (Harbin Institute of Technology, P.R. China), Yijie Wang (Harbin Institute of Technology, P.R. China), Wang Wei (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China) .....	4843
<i>A Hybrid Control Method for Modified SEPIC Converter with High Voltage Gain and ZVS Characteristic</i>	
Shanshan Gao (Harbin Institute of Technology, P.R. China), Yijie Wang (Harbin Institute of Technology, P.R. China), Yueshi Guan (Harbin Institute of Technology, P.R. China), Yousu Yao (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China), Yining Liu (HIT, P.R. China) .....	4848

## Reluctance Machines and Drives (3-1)

<i>A Robust Over-modulation Scheme for Direct Torque and Flux Controlled Reluctance Synchronous Motors in Field-weakening Region</i>	
Xinan Zhang (University of Western Australia, Australia), Zhixun Ma (Tongji University, P.R. China), Gilbert Foo (Auckland University of Technology, New Zealand), Linjie Ren (Tongji University, P.R. China) .....	4854
<i>Losses in Different Doubly Salient Synchronous Reluctance Machines with Current Harmonic Injection</i>	
Kai Zhang (The University of Sheffield, United Kingdom (Great Britain)), Guangjin Li (The University of Sheffield, United Kingdom (Great Britain)), Zi Qiang Zhu (University of Sheffield, United Kingdom (Great Britain)), Geraint Wyn Jewell (University of Sheffield, United Kingdom (Great Britain)), Rui Zhou (The University of Sheffield, United Kingdom (Great Britain)) .....	4860
<i>Direct Instantaneous Torque Control of Switched Reluctance Machine Based on Modular Multi-Level Power Converter</i>	
Shoujun Song (Northwestern Polytechnical University, P.R. China), Chenfan Peng (Northwestern Polytechnical University, P.R. China), Zhenchao Guo (Northwestern Polytechnical University, P.R. China), Ruiqing Ma (Northwestern Polytechnical University, P.R. China), Weiguo Liu (Northwestern Polytechnic University, P.R. China) .....	4866
<i>Design And Optimization Of A Novel Linear Reluctance Resolver</i>	
Jie Li (Harbin Institute of Technology, P.R. China), Xiao Li (Harbin Institute of Technology, P.R. China), Xianguo Gui (Harbin Institute of Technology, P.R. China) .....	4872
<i>A Modified Current Predict Control with Incremental Inductance and Resistance Self-learning for Switched Reluctance Motor</i>	
Tianyi Zhao (Harbin Institute of Technology, P.R. China), Yingli Wu (Harbin Institute of Technology, P.R. China), Xianguo Gui (Harbin Institute of Technology, P.R. China) .....	4878
<i>An Offline Iterative Torque Optimization for Extended-Speed Control of Switched Reluctance Motor Drives</i>	
Tianyi Zhao (Harbin Institute of Technology, P.R. China), Jie Li (Harbin Institute of Technology, P.R. China), Xianguo Gui (Harbin Institute of Technology, P.R. China) .....	4884

## Linear Machines and Magnetic Levitations (3-1)

<i>Designing and controlling voice coil motor based on the Mars gravity simulation</i>	
Xiangrui Meng (Harbin Institute of Technology, P.R. China), Changhong Wang (Harbin Institute of Technology, P.R. China), Liwei Song (Harbin Institute of Technology, P.R. China), Qinbo Nie (Shanghai Institute of Space Flight Control Technology, P.R. China), Ziqi Wang (The Second High School in Liaoyang County, P.R. China) .....	4890
<i>Magnetic Unbalance and Thrust Ripple Reduction Design for Novel PMLSM with Halbach Consequent Pole</i>	
Xiaozhuo Xu (Henan Polytechnic University, P.R. China), Sun Zhen (Henan Polytechnic University, P.R. China), Baoyu Du (Henan Polytechnic University, P.R. China), Feng Haichao (Henan Polytechnic University, P.R. China), Jianfeng Lu (Henan Polytechnic University, P.R. China), Han Du (Henan Polytechnic University, P.R. China) .....	4895
<i>Topology Structure and Characteristics Analysis of a Novel Detent-force-based Magnetic Suspension System</i>	
Jianfeng Lu (Henan Polytechnic University, P.R. China), Baoyu Du (Henan Polytechnic University, P.R. China), Xiaozhuo Xu (Henan Polytechnic University, P.R. China), Feng Haichao (Henan Polytechnic University, P.R. China), Yan Gao (Henan Polytechnic University, P.R. China), Sun Zhen (Henan Polytechnic University, P.R. China) .....	4900
<i>Thrust Optimization of Tubular C-core Modular Linear Permanent-Magnet Synchronous Motor</i>	
Jing Zhao (Beijing Institute Of Technology, P.R. China), Quansong Mou (Beijing Institute Of Technology, P.R. China), Keyu Guo (Institute of Electrical Engineering of the Chinese Academy of Sciences, P.R. China), Bin Li (Beijing Institute Of Technology, P.R. China), Xiangdong Liu (Beijing Institute of Technology, P.R. China) .....	4905
<i>The study on the force characteristics of Stacked Tapes Subjected to Traveling-wave Magnetic Field</i>	
Jing Li (Southwest Jiaotong University, P.R. China), Le Han (Southwest Jiaotong University, P.R. China), Xiang Li (Southwest Jiaotong University, P.R. China), Pengbo Zhou (Southwest Jiaotong University, P.R. China), Xuliang Song (Southwest Jiaotong University, P.R. China), Guangtong Ma (Southwest Jiaotong University, P.R. China) .....	4911
<i>Structure and Electromagnetic Characteristics of Vertical Movement U-shaped Permanent Magnet Salient Pole Linear Motor</i>	
Xiaozhuo Xu (Henan Polytechnic University, P.R. China), Shengyang Ji (Henan Polytechnic University, P.R. China), Baoyu Du (Henan Polytechnic University, P.R. China), Xudong Wang (Henan Polytechnic University, P.R. China), Chengzhe Wang (Henan Polytechnic University, P.R. China), Jianfeng Lu (Henan Polytechnic University, P.R. China) .....	4917

## SS: Wireless Power Transfer (2-2)

<i>Interoperability Analysis and Improvement for Rectangular Coil and DD Coil of Wireless EV Charging</i>	
Kai Song (Harbin Institute of Technology, P.R. China), Yu Guo (Harbin Institute of Technology, P.R. China), Guang Yang (Harbin Institute of Technology, P.R. China), Xiaohua Huang (China Electric Power Research Institute, P.R. China), Hang Zhang (Harbin Institute of Technology, P.R. China), Qian Zhang (State Grid Beijing Power Research Institute, P.R. China), Rengui Lu (Harbin Institute of Technology, P.R. China), Chunbo Zhu (Harbin Institute of Technology, P.R. China) .....	4922
<i>A Simplified Design Method of LCC Topology with circular Coil for Wireless Power Transfer</i>	
Shaocong Zhou (Harbin Insitute of Technology, P.R. China), Shuai Dong (Harbin Institute of Technology, P.R. China), Chunbo Zhu (Harbin Institute of Technology, P.R. China), CC Chan (University of Hongkong, Hong Kong), Shumei Cui (Harbin Institute of Technology, P.R. China), Leran Zheng (Harbin Insitute of Technology, P.R. China) .....	4927
<i>An Improved Self-Optimization Control Method for Magnetic Energy Harvesters</i>	
Chen Gao (Harbin Institute of Technology, P.R. China), Jingxuan Li (Harbin Normal University High School, P.R. China), Jie Ma (Harbin Institute of Technology, P.R. China) .....	4931
<i>High frequency effect analysis and optimization design of WPT magnetic coupling mechanism</i>	
Bin Wei (Chinese Electric Power Research Institute, P.R. China), Songcen Wang (Chinese Electric Power Research Institute, P.R. China), Xiaokang Wu (Chinese Electric Power Research Institute, P.R. China), Chong Xu (Chinese Electric Power Research Institute, P.R. China), Jinxing Xu (Chinese Electric Power Research Institute, P.R. China), Jilin Gao (Harbin Institute of Technology, P.R. China), Hongyu Wang (Harbin Institute of Technology, P.R. China) .....	4937
<i>Influence of Winding Direction of Solenoid Coil or Spiral Coil on Power Transfer Efficiency in Wireless Power Transfer</i>	
Shota Yodogawa (Kogakuin University, Japan), Mimpei Morishita (Kogakuin University, Japan, unknown) .....	4943
<i>A Novel Efficiency-oriented Frequency Tracking Method for WPT Systems</i>	
Kaixing Lu (Harbin Institute of Technology, P.R. China), Yijie Wang (Harbin Institute of Technology, P.R. China), Yousu Yao (Harbin Institute of Technology, P.R. China), Mai Jianwei (Harbin Institute of Technology, P.R. China), Haisong Cheng (Harbin Institute of Technology, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China), Longlong Zhang (Shandong Institute of Space Electronic Technology, P.R. China), Lei Wang (Shandong Institute of Space Electronic Technology, P.R. China) .....	4947



## Magnetics and Field Analysis (2-2)

<i>Coupled Electromagnetic-Thermal Analysis of a 130kW Interior-PM Machine for Electric Vehicles based on Field-Circuit Coupling Method</i>	
Wenfei Yu (Southeast University, P.R. China), Wei Hua (Southeast University, P.R. China), Peixin Wang (Southeast University, P.R. China), Chenxin Tang (Southeast University, P.R. China), Zhang Gan (Southeast University, P.R. China), Ruiwu Cao (Nanjing University of Aeronautics and Astronautics & College of Automation Engineering, P.R. China)	4952
<i>Coupling Calculation of 3D Whole Domain Steady Flow and Temperature Field for Underwater Oil-Filled Brushless DC Motors</i>	
Yan Hai (Harbin University of Science and Technology, P.R. China)	4957
<i>Design and Analysis of a Novel Two-Dimensional High Frequency Magnetic Tester for Nanocrystalline Alloy Material</i>	
Ming Yang (Hebei University of Technology, P.R. China), Yongjian Li (Hebei University of Technology, P.R. China), Qingxin Yang (Tianjin University of Technology, P.R. China), Shuaichao Yue (Hebei University of Technology, P.R. China), Changgeng Zhang (Hebei University of Technology, P.R. China), He Sun (Hebei University of Technology, P.R. China)	4963
<i>Measurement method of the B-H characteristics in open circuit for Nd-Fe-B magnet</i>	
Naoya Hieda (Shibaura Institute of Technology, Japan), Kan Akatsu (Shibaura Institute of Technology, Japan)	4968
<i>An Improved Steinmetz Premagnetization Graph (SPG) Applied in High Magnetic Field</i>	
Jiayin Chen (Zhejiang University, P.R. China), Jien Ma (Zhejiang University, P.R. China), Youtong Fang (Zhejiang University, P.R. China)	4972

## Permanent-Magnet Generator Systems (2-1)

<i>Optimization Design of Low Speed Axial Flux Halbach Permanent-Magnet Generator with PCB Winding</i>	
Zhiwei Wen (Institute of Electrical Engineering, P.R. China), Xiong Bin (Chinese Academy of Sciences, unknown), Gu Guobiao (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China)	4977
<i>Contrastive Analysis of Multi-Scheme Design of Marine High-Speed Permanent Magnet Rectifier Power Generation Module</i>	
Shan Li (Shanghai Marine Equipment Research Institute, P.R. China), Changsheng Chen (Shanghai Marine Equipment Research Institute, P.R. China), Lin Chen (Shanghai Marine Equipment Research Institute, P.R. China), Maocai Chen (Shanghai Marine Equipment Research Institute, P.R. China), Zhi Yang (Shanghai Marine Equipment Research Institute, P.R. China), Jiayu Zhang (Shanghai Marine Equipment Research Institute, P.R. China), Pingxi Yang (Shanghai Marine Equipment Research Institute, P.R. China)	4981
<i>Carbon-Fiber-Wrapped Rotor Strength Analysis for High-speed Permanent Magnet Synchronous Machine</i>	
Zhi Yang (Shanghai Marine Equipment Research Institute, P.R. China), Pingxi Yang (Shanghai Marine Equipment Research Institute, P.R. China), Tairan Zhao (Shanghai Marine Equipment Research Institute, P.R. China), Lin Chen (Shanghai Marine Equipment Research Institute, P.R. China), Shan Li (Shanghai Marine Equipment Research Institute, P.R. China), Jiayu Zhang (Shanghai Marine Equipment Research Institute, P.R. China)	4987
<i>A speed fluctuation suppressing method for gas turbine generator system during load sudden change</i>	
Peng Meng (Chinese Academy of Sciences & Institute of Electrical Engineering, P.R. China)	4995
<i>Detecting Eccentricity and Demagnetization Fault of Permanent Magnet Synchronous Generators in Transient State</i>	
Sveinung Attestog (University of Agder, unknown), Khang Huynh (University of Agder, Norway), Kjell Robbersmyr (University of Agder, Norway)	4999
<i>Research on Stator Core Radial Ventilation Duct of Permanent Magnet Synchronous Generator</i>	
Guohui Li (University of Chinese Academy of Sciences, P.R. China), Xiong Bin (Chinese Academy of Sciences, unknown), Hualin Shi (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Yun Feng (University of Chinese Academy of Sciences, P.R. China)	5004

## Reliability and Diagnostics (2-2)

<i>A Study on Fault Classification System Based on Deep Learning Algorithm Considering Speed and Load Condition</i>	
Ji-Hoon Han (Hoseo University, Korea), Sang-Uk Park (Hoseo University, Korea), Dong-Jin Choi (Hoseo University, Korea), Sun-Ki Hong (Hoseo University, Korea)	5009
<i>Diagnosis of Electric Motor Using Acoustic noise Based on CNN</i>	
Dong-Jin Choi (Hoseo University, Korea), Ji-Hoon Han (Hoseo University, Korea), Sang-Uk Park (Hoseo University, Korea), Sun-Ki Hong (Hoseo University, Korea)	5013

<i>An Adaptive Torque Ripple Suppression Method of Three-Phase PMSM During Single-Phase Open-Circuit Fault-Tolerant Operation</i>	
Yuliang Guo (Zhejiang University, P.R. China), Lijian Wu (Zhejiang University, P.R. China), Xiaoyan Huang (Zhejiang University, P.R. China), Youtong Fang (Zhejiang University, P.R. China), Jiaming Liu (Zhejiang University, P.R. China)	5017
<i>Stator Temperature Estimation of PMSM Based on Thermal Equivalent Circuit</i>	
Jonghun Choi (Seoul National University, Korea), Jun Lee (Seoul National University, Korea), Jung-Ik Ha (Seoul National University, Korea)	5022
<i>A Voltage-Based Open-Circuit Fault Diagnosis Approach for Single-Phase Cascaded H-Bridge Rectifiers</i>	
Dong Xie (Southwest Jiaotong University, P.R. China), Yichi Zhang (Southwest Jiaotong University, P.R. China), Xing-Lai Ge (Southwest Jiaotong University, P.R. China)	5026
<i>An Optimized Open Circuit Switch Faults Diagnosis for Three Level Active NPC Converter</i>	
Zhang Bo (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Qiongquan Ge (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Yaohua Li (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China)	5032

## Noise, Vibration, EMI and EMC (2-1)

<i>Interior Ballistic Characteristics of Continuous Launch of Electromagnetic Rail Launcher</i>	
Peipei Du (Naval University of Engineering, P.R. China), Junyong Lu (Naval University of Engineering, P.R. China), Sai Tan (Naval University of Engineering, P.R. China), Junhong Feng (Naval University of Engineering, P.R. China), Feifei Yan (Naval University of Engineering, P.R. China), Kai Li (Naval University of Engineering, P.R. China)	5036
<i>Vibration Reduction by Magnetic Slot Wedge for Rotating Armature Permanent Magnet Motors</i>	
Zhanlu Yang (Tsinghua University, P.R. China), Shanming Wang (Tsinghua University, P.R. China), Yuguang Sun (Tsinghua University, P.R. China), Haixiang Cao (Tsinghua University, P.R. China)	5044
<i>Vibration and Noise Emitted by Dry-type Air-core Reactors Under Sine-wave Current Excitation</i>	
Jingsong Li (Tsinghua University, P.R. China), Baojun Qu (Hebei University of Technology, P.R. China), Keping Yu (Waseda University, Japan)	5049
<i>Vibration Analysis of Dual Redundant Permanent Magnet Synchronous Motor in Two Operating Conditions</i>	
Yukai Yang (Tianjin University, P.R. China), Yiguang Chen (Tianjin University, P.R. China), Weijie Hao (Tianjin University, P.R. China), Qing Zhang (Tianjin University, P.R. China), Lili Kang (Tianjin University, P.R. China)	5054
<i>Electromagnetic shielding design for magnetic coupler of N-type dynamic electric vehicle wireless power transfer systems</i>	
Songcen Wang (Chinese Electric Power Research Institute, P.R. China), Bin Wei (Chinese Electric Power Research Institute, P.R. China), Xiaokang Wu (Chinese Electric Power Research Institute, P.R. China), Chong Xu (Chinese Electric Power Research Institute, P.R. China), Jinxing Xu (Chinese Electric Power Research Institute, P.R. China), Weimei Ge (School of Electrical Engineering-Harbin Institute of Technology, P.R. China), Jiaqi Xu (School of Electrical Engineering-Harbin Institute of Technology, P.R. China)	5060
<i>Rotordynamic Analysis of a Permanent Magnet Synchronous Motor Considering Nonlinear Unbalanced Magnetic Pull</i>	
Wei Dai (University of Nottingham Ningbo China, P.R. China), Jian Yang (University of Nottingham Ningbo China, P.R. China), He Zhang (University of Nottingham Ningbo China, P.R. China), Zeyuan Xu (University of Nottingham, United Kingdom (Great Britain)), Dunant Halim (University of Nottingham Ningbo China, P.R. China), Jing Li (University of Nottingham Ningbo China, P.R. China)	5067

## Permanent-Magnet Motors and Drives (14-10)

<i>Design of High Current PMSM Drives based on Parallel-connected Power MOSFETs Technology</i>	
Boyang Li (Shanghai University, P.R. China), Jian Luo (Shanghai University, P.R. China), Zhihui Jin (Shanghai University, P.R. China), Chun Chen (Shanghai University, P.R. China)	5073
<i>Compensation of Current Harmonics for Switching-Tabled-Based Direct Torque Control of Dual Three-Phase PMSM Drive</i>	
Bo Shao (University of Sheffield, United Kingdom (Great Britain)), Zi Qiang Zhu (University of Sheffield, United Kingdom (Great Britain)), Jianghua Feng (CRRC Zhuzhou Institute Co. Ltd, P.R. China), Shiyong Guo (CRRC Zhuzhou Institute Co. Ltd, P.R. China), Yifeng Li (CRRC Zhuzhou Institute Co. Ltd, P.R. China), Wu Liao (CRRC Zhuzhou Institute Co. Ltd, P.R. China)	5079
<i>Adjustable Field PM Motor Based on Permeability Modulation Technique Using Zero-Phase Current</i>	
Toshihiko Noguchi (Shizuoka University, Japan), Kiyohiro Iwama (Shizuoka University, Japan), Masahiro Aoyama (Shizuoka University, unknown)	5085

<i>A Universal Maximum Torque per Ampere Method for Permanent Magnet Synchronous Machines</i> Jiali Liu (North China University of Technology, P.R. China), Yongchang Zhang (North China University of Technology, P.R. China) .....	5091
<i>A Changeover of Rotor Position Estimation between Rotor Speed Adaptive Stator Flux Observer and High-frequency Injection and Dead-Time Compensation Scheme for Sensorless Vector Control System of PMSM</i> Jinbo Liu (Shandong University, P.R. China), Jinlei Chen (School of Engineering, Cardiff University, P.R. China) .....	5096
<i>A Simplified Robust Model Predictive Flux Control of Open-Winding PMSM Based on ESO</i> Wenhan Chen (Zhejiang University, P.R. China), Dan Sun (Zhejiang University, P.R. China) .....	5102

## Permanent-Magnet Motors and Drives (14-11)

<i>Cogging Torque Minimization in Novel Direct-Drive PMSM with Toroidal Windings</i> Mengzhen Gao (Henan Polytechnic University, P.R. China), Jikai Si (Zhengzhou University, P.R. China), Caixia Gao (Henan Polytechnic University, P.R. China), Zhiping Cheng (Zhengzhou University, P.R. China), Peng Su (Zhengzhou University, P.R. China), Zhongwen Li (Zhengzhou University, P.R. China) .....	5108
<i>Research on Vector Control Strategy and SVPWM Algorithms Based on Five-phase PMSM</i> Jinfei Yao (Huazhong University of Science and Technology, P.R. China), Xuefan Wang (Huazhong University of Science and Technology, P.R. China), Jing Chen (Huazhong University of Science and Technology, P.R. China) .....	5113
<i>Design and Comparative Study of an Outer-Rotor Magnetic-Gear-Integrated Brushless Motor with Halbach Arrangement</i> Junshuai Cao (Huaqiao University, P.R. China), Guo Xinhua (Huaqiao University, P.R. China) .....	N/A
<i>A Novel Variable-Flux PMSM with Parallel Hybrid Magnets Capable of Operating in a Wide Speed Range</i> Guangyuan Qiao (Harbin Institute of Technology, P.R. China), Mingqiao Wang (Harbin Institute of Technology, P.R. China), Faliang Liu (Harbin Institute of Technology, P.R. China), Yong Liu (Harbin Institute of Technology, P.R. China), Jingang Bai (Harbin Institute of Technology, P.R. China), Ping Zheng (Harbin Institute of Technology, P.R. China) .....	5123
<i>Electromagnetic Analysis of Compound Excitation High Speed Permanent Magnet Synchronous Motor</i> Ding Wang (Chongqing University, P.R. China), Qiping Shen (Chongqing University of Technology, P.R. China), Xin Chen (Chongqing University, P.R. China), Li Han (Chongqing University, P.R. China) .....	5128

## Permanent-Magnet Motors and Drives (14-12)

<i>Improved Weighting Factor Selection Method of Predictive Torque Control for High Speed Surface-mounted PMSM based on RBFNN</i> Tao Liu (Tianjin Polytechnic University, P.R. China), Yan Cai (Tianjin Polytechnic University, P.R. China) .....	5134
<i>Analysis of Electromagnetic Vibration Characteristics of An Interior Permanent Magnet Synchronous Motor</i> Chendong Liao (Nanjing University of Aeronautics and Astronautics, P.R. China), Wenyong Jiang (Nanjing University of Aeronautics and Astronautics, P.R. China), Zhuoran Zhang (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	5140
<i>Fault-tolerant Control for Dual Permanent Magnet Synchronous Motor Drive Based on Improved Current Hysteresis Algorithm</i> Hai Lin (Chang'an University, P.R. China), Dengkai Xia (Chang'an University, P.R. China), Feng Li (Chang'an University, P.R. China), Xiwei Zhou (Chang'an University, P.R. China), Jie Li (Chang'an University, P.R. China), Fei Zhao (Harbin Institute of Technology (Shenzhen), P.R. China) .....	5145
<i>Comparative Study of Axial Flux Vernier Machine with SMC Cores for Electric Vehicle Application</i> Chengcheng Liu (Hebei University of Tech, P.R. China), Youhua Wang (Hebei University of Technology, P.R. China), Gang Lei (University of Technology Sydney, Australia), Youguang Guo (University of Technology Sydney, Australia), Jianguo Zhu (University of Technology Sydney, Australia) .....	5149
<i>Thermal Comparison of Axial and Radial Flux Permanent Magnet Motor with the Same Volume</i> Xin Chen (Chongqing University, P.R. China), Qiping Shen (Chongqing University of Technology, P.R. China), Ding Wang (Chongqing University, P.R. China), Li Han (Chongqing University, P.R. China) .....	5154
<i>Analysis and Optimization of Rotor Structure in Interior Permanent Magnet Synchronous Motors Considering Pole Shoe Deformation</i> Feng Chai (Harbin Institute of Technology, P.R. China), Yuehong Wu (Harbin Institute of Technology, P.R. China), Yulong Pei (Harbin Institute of Technology (HIT), P.R. China), Lin Yuan (Shanghai AMP&MOONS' Automation CO., LTD., P.R. China) .....	5160

## Power converters (8-6)

<i>High Efficiency and High Power Density Interleaved DC-DC Converter for Electric Vehicles</i> Zimo Yuan (Harbin Institute of Technology, P.R. China), Jinxin Wang (Harbin Institute of Technology, P.R. China), Xue Yuan (Harbin Institute of Technology, P.R. China), Qianfan Zhang (Harbin Institute of Technology (HIT), P.R. China) .....	5164
<i>Analysis and Control of a Hybrid-clamped Four-level <math>\pi</math>-type Converter</i> Bosen Jin (The University of Bristol, United Kingdom (Great Britain)), Xibo Yuan (The University of Bristol, United Kingdom (Great Britain)) .....	5169
<i>Interleaved Boost PFC control strategy based on repetitive control</i> Jiaqi Zheng (Northeastern University, P.R. China), Tao Zhang (School of Electrical Engineering, Dalian University of Technology & Shenyang Institute of Automation, Chinese Academy of Sciences, Shenyang, P.R. China), Hualiang Zhang (Shenyang Institute of Automation, Chinese Academy of Sciences, P.R. China), Pengpeng Ren (Northeastern University, P.R. China), Rongkai Su (Shenyang Ligong University, P.R. China) .....	5177
<i>Review of DC Circuit Breaker Technology for HVDC Application</i> Chuan Du (Harbin Institute of Technology, Shenzhen, P.R. China), Can Wang (Harbin Institute of Technology (Shenzhen), P.R. China) .....	5183
<i>Fault Analysis and Control of High Power Inductively Power Transfer System with Multiple Pick-up Modules</i> Zhenggang Yin (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Liming Shi (Institute on Electrical Engineering, Chinese Academy of Sciences, P.R. China), Zhang Bo (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China) .....	5189

## Reluctance Machines and Drives (3-2)

<i>Direct Torque Control of a Novel Modular Structure Hybrid-Excitation Switched Reluctance Motor Based on Vector Control</i> He Bian (Xi'an Jiaotong University, P.R. China), Wen Ding (Xi'an Jiaotong University, P.R. China), Yangyang Li (Xi'an Jiaotong University, P.R. China), Kaidi Song (Xi'an Jiaotong University, P.R. China) .....	5194
<i>Single Machine Control of Axial Force for Conical Bearingless Switched Reluctance Motors</i> Wei Miao (Nanjing University of Aeronautics and Astronautics, P.R. China), Xin Cao (Nanjing University of Aeronautics and Astronautics, P.R. China), Xiaodi Li (Nanjing University of Aeronautics and Astronautics, P.R. China), Hongyan Hu (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	5199
<i>Torque Ripple Compensation Control with Optimized Advanced Angle for Doubly Salient Electro-magnetic Machine</i> Lingmin Zhang (Huazhong University of Science and Technology, P.R. China), Shuanghong Wang (Huazhong University of Science and Technology, P.R. China) .....	5204
<i>An Integrated BLIL Boost Converter-based Switched Reluctance Motor Drive for PEV Applications with PFC Charging Function</i> Chao Feng (Zhejiang University, P.R. China), Jianhua Wu (Zhejiang University, P.R. China), Qingguo Sun (Zhejiang University, P.R. China), Hang Wu (Zhejiang University, P.R. China), Le Zhang (Zhejiang Founder Motor Limited Company, P.R. China) .....	5209
<i>Development of Switched Reluctance Motor Drives with Power Factor Correction Charging Function for Electric Vehicle Application</i> Fanyu Meng (Huazhong University of Science and Technology, P.R. China), Zhiyue Yu (Huazhong University of Science and Technology, P.R. China), Yu Chen (Huazhong University of Science and Technology, P.R. China), Chun Gan (Huazhong University of Science and Technology, P.R. China), Ronghai Qu (Huazhong University of Science and Technology, P.R. China) .....	5214
<i>A Study of Torque Characteristics of a Novel Flux Reversal Machine</i> Yuansheng Zhao (School of Electrical Engineering and Automation, Harbin Institute of Technology, P.R. China), Baoquan Kou (Harbin Institute of Technology, P.R. China), Xiaokun Zhao (School of Electrical Engineering and Automation, Harbin Institute of Technology, P.R. China) .....	5220

## Special Machines and Actuators (2-1)

<i>Attitude Control of Staring-Imaging Satellite Using Permanent Magnet Momentum Exchange Sphere</i> Hongfeng Li (Tianjin University, P.R. China), Yanfen Zhao (Tianjin University, P.R. China), Bin Li (Tianjin University, P.R. China), Guidan Li (Tianjin University, P.R. China) .....	5225
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------

<i>Analysis of a New Switched Flux Permanent Magnet Coupler with Synchronous Rotating Adjuster</i> Mingguang Cao (Beijing University of Technology, P.R. China), Lezhi Ye (Beijing University of Technology, P.R. China), Desheng Li (Beijing University of Technology, P.R. China) .....	5231
<i>A single-mode bidirectional ultrasonic motor using first-order radial vibration mode of piezoelectric vibrators</i> Xiaoxiao Dong (Hohai University, P.R. China), Chunrong Jiang (Nanjing Institute of Technology, unknown), Long Jin (Southeast University, P.R. China), Yue Yuan (Hohai University, P.R. China) .....	5236
<i>Kinematics Modeling and Pitch Diameter Modification of the Standard Planetary Roller Screw Mechanism</i> Xinhua Zhang (Beijing Institute of Automatic Control Equipment, P.R. China), Xijian Huo (Beijing Institute of Automatic Control Equipment, P.R. China), Jian Huang (Beijing Institute of Automatic Control Equipment, P.R. China), Xiaoshuai Duan (Beijing Institute of Automatic Control Equipment, P.R. China), Guan Wang (Beijing Institute of Automatic Control Equipment, P.R. China) .....	5240
<i>Optimization and Calorimetric Analysis of Axial Flux Permanent Magnet Motor for Implantable Blood Pump Assisting Fontan Circulation</i> Emanuel J Hubmann (Power Electronic Systems Laboratory ETH Zurich, Switzerland), Dominik Bortis (ETH Zürich, Switzerland), Michael Flankl (Power Electronic Systems Laboratory ETH Zurich, Switzerland), Marcus Granegger (Pediatric Heart Center, University Children's Hospital Zurich, Switzerland), Michael Hübler (Pediatric Heart Center, University Children's Hospital Zurich, Switzerland), Johann. W. Kolar (ETH Zurich, Switzerland) .....	5246
<i>A simplified model of inverse kinematics of permanent magnet spherical motor</i> Hongfeng Li (Tianjin University, P.R. China), Xu Chen (Tianjin University, P.R. China), Bin Li (Tianjin University, P.R. China) .....	5254

## SS: Design, Control and Applications of Dual-Port Electrical Machines and Systems (1-1)

<i>Optimized Vector Control strategy for Contra-rotating Permanent Magnet Synchronous Motor under serious unbalanced load adopting torque compensation</i> Luo Derong (Hunan Huniversity, P.R. China), Ruizhi He (Hunan University, P.R. China), Shoudao Huang (Hunan University, P.R. China), Xin Su (Hunan University, P.R. China) .....	5260
<i>Design of Multi-axis Motion Control and drive System Based on Internet</i> Pengfei Li (Beijing Research Institute of Precise Mechatronics and Controls, P.R. China), Yuping Huang (Beijing Research Institute of Precise Mechatronic Controls, P.R. China), Yanbo Wang (Beijing Research Institute of Precise Mechatronics and Controls, P.R. China), Qing Zhao (Beijing Research Institute of Precise Mechatronics and Controls, P.R. China), Zelin Yang (Beijing Research Institute of Precise Mechatronics and Controls, P.R. China) .....	5266
<i>Comparative Study on Compound Coil Rotor of A Novel Brushless Doubly-Fed Machine Based on Soft Starting</i> Chaohao Kan (Hefei University of Technology, P.R. China), Jie Zheng (Hefei University of Technology, P.R. China), Xichang Bao (Hefei University of Technology, P.R. China), Ke Jin (Hefei University of Technology, P.R. China), Xiao Li (Hefei University of Technology, P.R. China) .....	5272
<i>Optimization Design of a Flux Switching Linear Rotary Permanent Magnet Machine</i> Kaikai Guo (Anhui University of Science and Technology, P.R. China) .....	5278
<i>Research on the Characteristics of Open winding Brushless DC Motor</i> Huang Qi (Northwestern Polytechnical University, P.R. China), Luo Ling (Northwestern Polytechnical University, P.R. China), Xue Li Kun (Northwestern Polytechnical University, P.R. China), Tang Yang (National Engineering Research Center for Small and Special Precision Motors, P.R. China) .....	5284

## SS: Linear Motors and Drives (1-1)

<i>Robustness Improvement of Predictive Current Control for H-LVPMM Considering Parameter Variation</i> Xinqi Chen (Huazhong University of Science and Technology, P.R. China), Lulu Tong (ZheJiang Electric Power Corporation Maintenance Branch, P.R. China), Wubin Kong (Huazhong University & Technology, P.R. China), Dong Jiang (Huazhong University of Science and Technology, P.R. China), Ronghai Qu (Huazhong University of Science and Technology, P.R. China) .....	5290
<i>Application of An Improved GPC Algorithm in Permanent Magnet Synchronous Linear Motor Position Control System</i> Qiyong Chen (Huaqiao University, P.R. China), Rongkun Wang (Huaqiao University, P.R. China) .....	5294

<i>Design of Tubular Permanent Magnet Synchronous Linear Motor in a Wide Temperature Range Environment by Taguchi-fuzzy Method</i>	
Wenshuai Zhou (Nanjing University of Aeronautics and Astronautics, P.R. China), Xuzhen Huang (Nanjing University of Aeronautics and Astronautics, P.R. China), Tianpeng Ji (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	5298
<i>Dichotomy Solution Based Model Predictive Control for Permanent Magnet Linear Synchronous Motors</i>	
Zhixun Ma (Tongji University, P.R. China), Yan Sun (Tongji University, P.R. China), Yuan zhe Zhao (Tongji University, P.R. China), Zhenbin Zhang (School of Electrical Engineering Shandong University, P.R. China), Guobin Lin (Tongji University, P.R. China) .....	5303
<i>Mover Optimization and Mechanical Strength Analysis of a Tubular Permanent-Magnet Linear Motor</i>	
Yuchen Wei (Harbin Institute of Technology, P.R. China), Jingang Bai (Harbin Institute of Technology, P.R. China), Bin Yu (Beijing Institute of Aerospace Control Devices, P.R. China), Zuosheng Yin (Harbin Institute of Technology, P.R. China), Ping Zheng (Harbin Institute of Technology, P.R. China) .....	5308

## Permanent-Magnet Generator Systems (2-2)

<i>Modeling and Analysis of Multi-time Scale Transient Characteristics of a Series Hybrid Power System</i>	
Ying Zhang (Institute of Electrical Engineering of CAS&University of Chinese Academy of Sciences, P.R. China), Hui Xu Wen (Institute of Electrical Engineering Chinese Academy of Sciences & Key Laboratory of Power Electronics and Electric Drive, P.R. China), Hongyang Li (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China), Ke Li (University of Chinese Academy of Sciences, unknown), Jialin Wei (Institute of Electrical Engineering of CAS & University of Chinese Academy of Sciences, P.R. China), Youlong Wang (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China) .....	5312
<i>Influence of Demagnetization on Selecting the Optimum slot/pole number combination for 3MW surface Mounted Permanent Magnet Vernier Machine</i>	
Dileep Kumar (The University of Sheffield, United Kingdom (Great Britain)), Guangjin Li (The University of Sheffield, United Kingdom (Great Britain)), Zi Qiang Zhu (University of Sheffield, United Kingdom (Great Britain)), Martin Foster (University of Sheffield, United Kingdom (Great Britain)), David Stone (The University of Sheffield, United Kingdom (Great Britain)), Antonio Griffo (University of Sheffield, Italy), Milijana Odavic (University of Sheffield, United Kingdom (Great Britain)), Richard Clark (Siemens-Gamesa, United Kingdom (Great Britain)), Arwyn Thomas (Siemens-Gamesa, United Kingdom (Great Britain)) .....	5317
<i>Calculation of Inter-Turn Short Circuit Current of a Permanent Magnet Synchronous Machine</i>	
Jing Zhao (Beijing Institute Of Technology, P.R. China), Chenghai Li (Beijing Institute of Technology, P.R. China), Quansong Mou (Beijing Institute Of Technology, P.R. China) .....	5323
<i>A New Active Damping Control Strategy for Stator Ironless Axial-Flux Permanent Magnet Generator System with LC Filter</i>	
Yukun Wang (Nanjing University of Aeronautics and Astronautics, P.R. China), Zhuoran Zhang (Nanjing University of Aeronautics and Astronautics, P.R. China), Jianbin Han (Nanjing University of Aeronautics and Astronautics, P.R. China), Jian Huang (Nanjing University of Aeronautics and Astronautics, unknown) .....	5329
<i>Optimization design of a novel toroidal-winding permanent magnet synchronous generator</i>	
Fuli Jin (Zhengzhou University, P.R. China), Jikai Si (Zhengzhou University, P.R. China), Zhiping Cheng (Zhengzhou University, P.R. China), Peng Su (Zhengzhou University, P.R. China), Lianghui Dong (Zhengzhou University, P.R. China), Ge Qi (Zhengzhou University, P.R. China) .....	5335

## Renewable Energy Systems (4-4)

<i>Performance Analysis of Combined Model-Predictive and Slide-Mode Control for Power Converters in Renewable Energy Systems</i>	
Habib Ur Rahman Habib (Huazhong University of Science and Technology, Wuhan, P.R. China & University of Engineering and Technology, Taxila, Pakistan), Shaorong Wang (Huazhong University of Science and Technology, Wuhan, P.R. China), Mahmoud F. Elmorshedy (Huazhong University of Science and Technology, Wuhan, P.R. China & Faculty of Engineering, Tanta University, Egypt), Asad Waqar (Bahria University, Pakistan) .....	5340
<i>Research on the Stability of Black Start for Voltage Source Controlled Inverters</i>	
Wei Zhao (Yanshan University, P.R. China), Mengju Zhang (School of Electrical Engineer, YanShan University, P.R. China), Xiaofeng Sun (Yanshan University, P.R. China), Xiaofeng Ma (Shijiazhuang Tonhe Electronics Technologies Co. Ltd, P.R. China), Weidong Xu (Shijiazhuang Tonhe Electronics Technologies Co., Ltd, P.R. China), Hongpo Wang (Shijiazhuang Tonhe Electronics Technologies Co., Ltd, P.R. China), Song Li (Shijiazhuang Tonhe Electronics Technologies Co., Ltd, P.R. China) .....	5345

<i>Research on Modular Structure and Control Technology of PV Array</i>	
Qiang Zhang (Harbin Engineering University, P.R. China), Xin He (Harbin Engineering University, P.R. China), Yu Duan (Harbin Engineering University, P.R. China), Jianqiao Wen (Harbin Engineering University, P.R. China)	5350
<i>Research on maximum power point contrast tracking of photovoltaic system based on improved particle swarm algorithm</i>	
Liangliang Liu (Tianjin University, P.R. China), Yanbo Che (Tianjin University, P.R. China), Hailian Bi (Tianjin University, P.R. China), Siyuan Xue (Tianjin University, P.R. China)	5356
<i>Analysis of a Carbon-free electrical energy regional model: A case of Jeju Island</i>	
Ankhzaya Baatarbileg (Jeju National University, Korea), Gae-myung Lee (Jeju National University, Korea), Zulmandakh Otgongerel (Jeju National University, Korea)	5364

## Energy Efficiency Systems (1-1)

<i>Efficiency Improvement in Electric Propeller by Maximum Efficiency Point Tracker</i>	
Yuchen Luo (Shanghai Jiao Tong University, P.R. China), Xiang Luo (Shanghai Jiao Tong University, P.R. China), Li Zhu (Shanghai Jiao Tong University, P.R. China), Shuzhong Jiang (Shanghai Jiao Tong University, P.R. China), Min Zhao (Shanghai Jiao Tong University, P.R. China)	5368
<i>Hybrid Renewable Microgrid System Based DC-bus Scheme for Residential Load Applications</i>	
Mahmoud F. Elmorshedy (Huazhong University of Science and Technology, Wuhan, P.R. China & Faculty of Engineering, Tanta University, Egypt), Kotb M. Kotb (Faculty of Engineering, Tanta University, Egypt & Budapest University of Technology and Economics, Budapest, Hungary), Andras Dan (Budapest University of Technology and Economics, Hungary)	5372
<i>An Optimal Energy Management Strategy for Parallel HEVs</i>	
Bo Zhang (Sophia University, Japan), Tielong Shen (Sophia University & Japan, Japan)	5378
<i>Implementation of Multi-objective Particle Swarm Optimization in Distribution Network for High-efficiency Allocation and Sizing of SAPFs</i>	
Zebin Yang (Xi'an Jiaotong University, P.R. China), Fang Zhuo (Xi'an Jiaotong University, P.R. China), Ran Tao (Xi'an Jiaotong University, P.R. China), Ziqian Zhang (Graz University of Technology, P.R. China), Hao Yi (School of Electrical Engineering of Xi'an Jiaotong University, P.R. China), Meng Wang (Xi'an Jiaotong University & School of Electrical Engineering Xi'an Jiaotong University, P.R. China), Chengzhi Zhu (Zhejiang Electric Power Corporation, P.R. China)	5383
<i>Positioning of Reactive Voltage Compensator Based on Genetic Algorithm in Distribution Network</i>	
Meng Wang (Xi'an Jiaotong University & School of Electrical Engineering Xi'an Jiaotong University, P.R. China), Hao Yi (School of Electrical Engineering of Xi'an Jiaotong University, P.R. China), Zebin Yang (Xi'an Jiaotong University, P.R. China), Ziqian Zhang (Graz University of Technology, P.R. China), Fang Zhuo (Xi'an Jiaotong University, P.R. China), Ran Tao (Xi'an Jiaotong University, P.R. China), Chengzhi Zhu (Zhejiang Electric Power Corporation, P.R. China)	5388

## Noise, Vibration, EMI and EMC (2-2)

<i>Modeling for Conducted Noise on AC/DC Converter by Using Impedance Characteristic</i>	
Kohei Mitani (Nagoya Institute of Technology, Japan), Wataru Kitagawa (Nagoya Institute of Technology, Japan), Takaharu Takeshita (Nagoya Institute of Technology, Japan)	5393
<i>Analysis of Vibration and Noise of IPMSM for Electric Vehicles under Inverter Harmonic in a Wide-speed Range</i>	
Xiaohua Li (Shanghai University of Electric Power, unknown), Xiaotong Tian (Shanghai University of Electric Power, P.R. China), Yuefei Wang (State Grid Anhui Fuyang Power Company, P.R. China), Rongjian Zhao (Shanghai University of Electric Power, P.R. China), Wendan He (Shanghai University of Electric Power, P.R. China)	5399
<i>Investigation on the AMDT Core Model Vibration by FEA and Validation of the Vibration Characteristics by the Testing Platform</i>	
Daosheng Liu (Jiangxi University of Science and Technology, P.R. China), Jiacheng Li (Jiangxi University of Science and Technology, P.R. China)	5405
<i>Experimental Study of Magnetostriction on Motor Vibration Considering Mechanical Characteristics</i>	
Haiyang Fang (Huazhong University of Science and Technology, P.R. China), Jiaxiong Guo (Huazhong University of Science and Technology, P.R. China), Yunsong Xu (Huazhong University of Science and Technology, P.R. China), Dawei Li (Huazhong University of Science & Technology, P.R. China), Ronghai Qu (Huazhong University of Science and Technology, P.R. China)	5409

### *Vibration Analysis of Permanent-Magnet-Assisted Synchronous Reluctance Machines*

Jiaqi Li (University of Nottingham, United Kingdom (Great Britain)), Hanafy Mahmoud (University of Nottingham, United Kingdom (Great Britain)), Michele Degano (University of Nottingham, United Kingdom (Great Britain)), Chris Gerada (University of Nottingham, United Kingdom (Great Britain)) .....	5413
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------

## Cooling Technologies (1-1)

### *Power Losses and Thermal Analysis of a Hollow-Shaft Rotor Cooling System*

Yaohui Gai (Motor Design Limited, United Kingdom (Great Britain)), Yew Chuan Chong (Motor Design Limited, United Kingdom (Great Britain)), Husain Adam (Motor Design Limited, United Kingdom (Great Britain)), James Goss (Motor Design Limited, United Kingdom (Great Britain)), Mircea Popescu (Motor design Ltd, United Kingdom (Great Britain)) .....	5419
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------

### *Thermal Model, Experimental Test and Cooling Strategy of Tubular Permanent Magnet Linear Motor (TPMLM)*

Jingzhou Gao (Xian Jiaotong University, P.R. China), Shengdun Zhao (Xian Jiaotong University, P.R. China), Xinchu Wu (Xian Jiaotong University, P.R. China), Wei Du (Xian Jiaotong University, P.R. China), Yi Hua (Xian Jiaotong University, P.R. China) .....	5425
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------

### *Sensitivity Analysis on Winding Temperature of Electrical Machines*

Fengyu Zhang (University of Nottingham, P.R. China), David Gerada (University of Nottingham, United Kingdom (Great Britain)), Zeyuan Xu (University of Nottingham, United Kingdom (Great Britain)), He Zhang (University of Nottingham Ningbo China, P.R. China), Chris Gerada (University of Nottingham, United Kingdom (Great Britain)) .....	5429
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------

### *Equivalent Slot Thermal Conductivity and Back-Iron Extension Effectiveness*

Fengyu Zhang (University of Nottingham, P.R. China), David Gerada (University of Nottingham, United Kingdom (Great Britain)), Zeyuan Xu (University of Nottingham, United Kingdom (Great Britain)), He Zhang (University of Nottingham Ningbo China, P.R. China), Chris Gerada (University of Nottingham, United Kingdom (Great Britain)) .....	5434
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------

### *An improved rotor cooling structure of IPMSM*

Ming Kang (Tianjin University, P.R. China), Liyan Guo (Tianjin Polytechnic University, P.R. China), Huimin Wang (Tianjin Polytechnic University, P.R. China), Zhiqiang Wang (Tianjin Polytechnic University, P.R. China), Changliang Xia (Tianjin Polytechnic University, P.R. China) .....	5439
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------

## Permanent-Magnet Motors and Drives (14-13)

### *Speed Feedforward Control Method Based on Improved Adaptive Filter for Permanent Magnet Synchronous Motor*

Yiyan Wang (Northwestern Polytechnical University, P.R. China), Zhao Xue (Beijing Institute of Precision Mechatronics and Controls & School of Automation, P.R. China), Xiaoli Duan (Key Laboratory of Aviation Science and Technology on Aerospace Power System, P.R. China), Yilun Liu (Northwestern Polytechnical University, P.R. China), Guangzhao Luo (Northwestern Polytechnical University, P.R. China) .....	5445
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------

### *Electromagnetic Performance Comparison of Doubly Salient PM Machines with Different Stator Iron Core Segments*

Guangqiang Ming (Zhejiang University, P.R. China), Lijian Wu (Zhejiang University, P.R. China) .....	5450
------------------------------------------------------------------------------------------------------	------

### *Comparison of Vernier Machines with Different Rotor PM Configurations*

Guopeng Liu (Harbin Institute of Technology, P.R. China), Yi Sui (Harbin Institute of Technology, P.R. China), Jiaqi Liu (Harbin Institute of Technology, P.R. China), Mingqiao Wang (Harbin Institute of Technology, P.R. China), Longlong Yang (Harbin Institute of Technology, P.R. China), Ping Zheng (Harbin Institute of Technology, P.R. China) .....	5455
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------

### *Analysis and Evaluation of Current Control System of PMSM with Time-Delay to Improve Parallelization for Implementation on Multi-core Processors*

Jinsoo Kim (Nagoya University, Japan) .....	5459
---------------------------------------------	------

### *Performance Analysis of Modular In-Wheel Motor with Open-Circuit Faults Considering Temperature Limitation*

Yue Tang (Harbin Institute of Technology, P.R. China), Yanjun Yu (Harbin Institute of Technology, P.R. China), Feng Chai (Harbin Institute of Technology, P.R. China) .....	5464
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------

## Power converters (8-7)

### *Analysis and Implement of Discontinuous Current Modes for a Buck Converter with the GaN Device*

Pengyu Jia (North China University of Technology, P.R. China), Zehui Huang (North China University of Technology, P.R. China), Yaozong Hao (North China University of Technology, P.R. China), Shengwen Fan (North China University of Technology, P.R. China) .....	5468
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------



<i>Light Load Characteristics and Control Optimization Strategy for Cascaded Multilevel DC Link SST</i> Xiaofeng Sun (Yanshan University, P.R. China), Honglong Wang (Yanshan University, P.R. China), Yunxiang Guo (Yanshan University, P.R. China), Yao Pan (Yanshan University, P.R. China) .....	5473
<i>Disturbance Observer Based Second Order Sliding Mode Control Strategy for DC-DC Buck Converters</i> Hao Lin (Harbin Institute of Technology, P.R. China), Yunfei Yin (Harbin Institute of Technology, P.R. China), Jianxing Liu (Harbin Institute of Technology, P.R. China), Ligang Wu (Harbin Institute of Technology, P.R. China), Leopoldo Franquelo (University of Seville, Spain) .....	5479
<i>An Optimized Design Method of Phase-Shift Angle in DPS Modulation Scheme for LCL-type Resonant DAB DC-DC Converters</i> Mingxue Li (China University of Mining and Technology, P.R. China), Xiaoqiang Li (China University of Mining and Technology, P.R. China), Chengyuan He (China University of Mining and Technology, P.R. China), Xiaojie Wu (China University of Mining and Technology, P.R. China) .....	5485
<i>Analysis and Design of Half-bridge Converter Based on CLCL Resonance Network</i> Hui Li (Harbin Institute of Technology, P.R. China) .....	5491

## Reluctance Machines and Drives (3-3)

<i>Analytical Inductance Calculation of an Outer Rotor Switched Reluctance Motor</i> Minjie Zhang (Shanghai Jiaotong University, P.R. China), Qiang Gao (Shanghai Jiaotong University, P.R. China), Xu Cai (Shanghai Jiaotong University, P.R. China) .....	5495
<i>Influence of Rotor Position Error on the Torque Performance of Doubly Salient Electro-magnetic Motor Drives</i> Xu Chen (Nanjing University of Aeronautics and Astronautics, P.R. China), Zhuoran Zhang (Nanjing University of Aeronautics and Astronautics, P.R. China), Yu Li (Nanjing University of Aeronautics and Astronautics, P.R. China), Zhangming Bian (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	5501
<i>Comparative Performance Analysis of Switched Reluctance Motors for Automotive Fan</i> Grace Lukman (Kyungsoong univ, Korea), Jin Who Ahn (Kyungsoong University, Korea), Kwang-Il Jeong (Kyungsoong University, unknown) .....	5507
<i>A combined control method for High Speed Switched Reluctance Motor</i> Peixin Jia (Xi'an Jiaotong University, P.R. China), Deliang Liang (Xi'an Jiaotong University, P.R. China), Shaofeng Jia (Xi'an Jiaotong University, P.R. China), Xin Qi (Xi'an Jiaotong University, P.R. China) .....	5511
<i>Study of High-speed SRM with Amorphous steel sheet for EV</i> Taketo Tomioka (Shibaura Institute of Technology, Japan), Kan Akatsu (Shibaura Institute of Technology, Japan) .....	5515

## Linear Machines and Magnetic Levitations (3-2)

<i>Eddy Current Effects on the Guiding System of High-Speed Maglev train</i> Yongpan Hu (National University of Defense Technology, P.R. China), Jiewei Zeng (National University of Defense Technology, P.R. China), Zhiqiang Long (National University of Defense Technology, P.R. China), Mingda Zhai (National University of Defense Technology, P.R. China) .....	5521
<i>Research on Multiple Topology and Modulation Strategy of Large Capacity Traction Inverter for High Speed Maglev Train</i> Panpan Cai (Beijing Jiaotong University, P.R. China), Xiaochun Fang (Beijing Jiaotong University, P.R. China), Zhongping Yang (Beijing Jiaotong University, P.R. China), Fei Lin (Beijing Jiaotong University, P.R. China) .....	5526
<i>Effect of static longitudinal end effect on performance of arc linear induction motor</i> Wenxuan Liu (Harbin Institute of Technology, P.R. China), Zongze Cui (Harbin Institute of Technology, P.R. China), Wei Hao (Harbin Institute of Technology, P.R. China), Liwei Song (Harbin Institute of Technology, P.R. China) .....	5531
<i>Analysis of Electromagnetic Characteristics of 16 Pole Radial Active Magnetic Bearings</i> YuSheng Hu (State Key Laboratory of Air-conditioning Equipment and System Energy Conservation, P.R. China), Bin Chen (State Key Laboratory of Air-conditioning Equipment and System Energy Conservation, unknown), Xiaobo Zhang (GREE, P.R. China), Fang Zhang (GREE, P.R. China), Gao Gong (GREE, P.R. China), Xin Li (GREE, P.R. China), Liyi Li (Harbin Institute of Technology (HIT), P.R. China) .....	5537

*Low stiffness magnetic vibration isolator based on Halbach permanent magnet array*

Junzhong Li (Center of Ultra-precision Optoelectronic Instrument Engineering, Harbin Institute of Technology, P.R. China), Lei Wang (Center of Ultra-precision Optoelectronic Instrument Engineering, Harbin Institute of Technology, P.R. China), Qi Liu (Center of Ultra-precision Optoelectronic Instrument Engineering, Harbin Institute of Technology, P.R. China), Shitong Wang (Center of Ultra-precision Optoelectronic Instrument Engineering, Harbin Institute of Technology, P.R. China), Zhen Zhang (Center of Ultra-precision Optoelectronic Instrument Engineering, Harbin Institute of Technology, P.R. China) ..... 5543

## SS: Emerging Electric Machines and Drives for Electrified Applications (1-1)

*Exact analytical solution for magnetic gear considering iron saturation*

Hang Zhao (School of Energy and Environment, City University of Hong Kong, Hong Kong, China, P.R. China), Chunhua Liu (School of Energy and Environment, City University of Hong Kong, Hong Kong, China, Hong Kong), Zaixin Song (School of Energy and Environment, City University of Hong Kong, Hong Kong, China, Hong Kong) ..... 5548

*Comparative Analysis of Slotless and Coreless Permanent-Magnet Synchronous Machines for Electric Aircraft Propulsion*

Zaixin Song (City University of Hong Kong, Hong Kong), Chunhua Liu (City University of Hong Kong, Hong Kong), Hang Zhao (City University of Hong Kong, P.R. China) ..... 5554

*A New Dual-Permanent-Magnet-Excited Motor with Hybrid Stator Configuration for Direct-Drive Applications*

Yujun Shi (Southern University of Science and Technology & University of Macau, P.R. China), Tze Wood Ching (University of Macau, Macao & University of Hong Kong, Hong Kong), Linni Jian (Southern University of Science and Technology, P.R. China), Wenlong Li (Nanjing University of Science and Technology, P.R. China) ..... 5560

*Sliding Mode Control of a Flux-Modulated Permanent-magnet In-Wheel Motor Based on a New Reaching Law*

Chenyang Mao (Southeast University, P.R. China), Ying Fan (Southeast University, P.R. China), Qiushi Zhang (Southeast University, P.R. China), Yeyi Mei (Southeast University, P.R. China), Bo Wang (Southeast University, P.R. China) ..... 5566

*Comparative Performance Analysis of Copper and Aluminum Wound Fractional-slot PMSMs for High-Speed Traction Application*

Shruthi Mukundan (University of Windsor, Canada), Himavarsha Dhulipati (University of Windsor, Canada), Lucas Chauvin (University of Windsor, Canada), Buddhika De Silva Guruwatta Vidanalage (University of Windsor, Canada), Afsaneh Edrissy (University of Windsor, Canada), Wenlong Li (University of Windsor, unknown), Jimi Tjong (University of Windsor, Canada), Narayan Kar (University of Windsor, Canada) ..... 5571

## SS: Emerging Flux Modulation Multi-Port Systems (1-1)

*Analysis and Reduction of Cogging Torque for Magnetic-Gear PMSG used in Wave Energy Conversion*

Hongwei Fang (Tianjin University, P.R. China), Runan Song (Tianjin University, P.R. China), Xiaoshi Cai (Beijing Institute of Aerospace Control Instruments, P.R. China) ..... 5577

*Sensorless Control of Dual Three-Phase PMSM with High Frequency Voltage Signal Injection*

Bin Xu (Shanghai Jiao Tong University, P.R. China), Xiang Luo (Shanghai Jiao Tong University, P.R. China), Li Zhu (Shanghai Jiao Tong University, P.R. China), Jimin Zhao (Shanghai Jiao Tong University, P.R. China) ..... 5583

*Design Optimization of a Pole-Changing Biased Flux Machine Based on Sensitivity Analysis*

Yuan Mao (The Hong Kong Polytechnic University, Hong Kong), Shuangxia Niu (The Hong Kong Polytechnic University, Hong Kong), Weinong Fu (The Hong Kong Polytechnic University, P.R. China) ..... 5587

*Analysis of Parameters and Eddy Current Loss on Outer Stator Magnetic Gear Integrated Permanent Magnet Motor*

Qing Zhang (Tianjin University, P.R. China), Yiguang Chen (Tianjin University, P.R. China), Yukai Yang (Tianjin University, P.R. China), Weijie Hao (Tianjin University, P.R. China), Lili Kang (Tianjin University, P.R. China) ..... 5593

*Optimal Design and control of Double-Rotor Flux-Bidirectional Modulation Machine*

Yunchong Wang (Zhejiang University, P.R. China), Shuangxia Niu (The Hong Kong Polytechnic University, Hong Kong) ..... 5600

## SS: High Speed Permanent Magnet Machine for Electrified Vehicles (1-1)

<i>Study of the Electromagnetic and Mechanical Properties of a High-silicon Steel for a High-speed Interior PM Rotor</i> Jing Ou (Elektrotechnisches Institut (ETI) & Karlsruhe Institute of Technology, Germany), Yingzhen Liu (Institute of Technical Physics (IPET), Germany), Patrick Breining (Institute of Electrical Engineering (ETI), Germany), Thomas Gietzelt (KIT, Germany), Torsten Wunsch (KIT, Germany), Martin Doppelbauer (Karlsruhe Institute of Technology, Germany) .....	5606
<i>Offline Inductance Identification of PMSM using High Frequency Current Signal Injection</i> Tao Liu (Technical University of Darmstadt & Institute for Power Electronics and Control of Drives, Germany), Ziqiang Ye (Technical University of Darmstadt, Germany), Changkai Wang (Gree Electric Appliances, Zhuhai, P.R. China), Chengbao Zhong (State Key Laboratory of Air-conditioning Equipment and System Energy Conservation, P.R. China), YuSheng Hu (State Key Laboratory of Air-conditioning Equipment and System Energy Conservation, P.R. China), Gerd Griepentrog (Technical University of Darmstadt, Germany) .....	5610
<i>Combined Lumped-Parameter and Simplified 2-D Analytical Thermal Model of Totally Enclosed Water Cooled PM Machine</i> Dawei Liang (University of Sheffield, United Kingdom (Great Britain)), Zi Qiang Zhu (University of Sheffield, United Kingdom (Great Britain)), Yafeng Zhang (University of Sheffield, United Kingdom (Great Britain)), Jianghua Feng (CRRC Zhuzhou Institute Co. Ltd, P.R. China), Shiyong Guo (CRRC Zhuzhou Institute Co. Ltd, P.R. China), Yifeng Li (CRRC Zhuzhou Institute Co. Ltd, P.R. China), Jianquan Wu (CRRC Zhuzhou Institute Co. Ltd, P.R. China), Anfeng Zhao (CRRC Zhuzhou Institute Co. Ltd, P.R. China) .....	5618
<i>Influence of Critical Parameters in Lumped-Parameter Thermal Models for Electrical Machines</i> Dawei Liang (University of Sheffield, United Kingdom (Great Britain)), Zi Qiang Zhu (University of Sheffield, United Kingdom (Great Britain)), Jianghua Feng (CRRC Zhuzhou Institute Co. Ltd, P.R. China), Shiyong Guo (CRRC Zhuzhou Institute Co. Ltd, P.R. China), Yifeng Li (CRRC Zhuzhou Institute Co. Ltd, P.R. China), Jianquan Wu (CRRC Zhuzhou Institute Co. Ltd, P.R. China), Anfeng Zhao (CRRC Zhuzhou Institute Co. Ltd, P.R. China) .....	5624
<i>Performance Characteristics of High Speed Permanent Magnet Motor with Different Rotor Retaining Sleeve</i> Chao Zhang (Shenyang University of Technology, P.R. China) .....	5630

## SS: Sensorless Control for AC Motor Drives (1-1)

<i>An Adaptive Sliding Mode Observer of Induction Motor in Sensorless Vector Control System</i> Jing Chen (Shanghai Marine Equipment Research Institute, P.R. China), Shan Jiang (Shanghai Marine Equipment Research Institute, P.R. China), Huadong Yu (Shanghai Marine Equipment Research Institute, P.R. China), Xin Liu (Shanghai Marine Equipment Research Institute, P.R. China), Zuocheng Yang (Shanghai Marine Equipment Research Institute, P.R. China), Maocai Chen (Shanghai Marine Equipment Research Institute, P.R. China) .....	5635
<i>Position Error Fluctuation Elimination for Model-Based Self-Sensing IPMSM Drives Incorporating ROGI Decoupling Network</i> Guoqiang Zhang (Harbin Institute of Technology, P.R. China), Xu Yang (Harbin Institute of Technology, P.R. China), Gaolin Wang (Harbin Institute of Technology (HIT) & School of Electrical Engineering and Automation, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China) .....	5639
<i>An Extended Speed Adaptive Observer with Auxiliary Variables for Sensorless Induction Motor Low-Speed Operation</i> ZhiXin Huo (Harbin Institute of Technology, P.R. China), Bo Wang (Harbin Institute of Technology, P.R. China), Yong Yu (Harbin Institute of Technology (HIT), P.R. China), Wang Tianqing (Harbin Institute of Technology, P.R. China), Cheng Luo (Harbin Institute of Technology & School of Electrical Engineering & Automation, P.R. China), Dianguo Xu (Harbin Institute of Technology, P.R. China) .....	5645
<i>Sensorless Control of Linear Induction Motor Based on SSLKF-PLL Speed Estimation Scheme</i> Huimin Wang (Southwest Jiaotong University, P.R. China), Songtao Li (Southwest Jiaotong University, P.R. China), Yun Zuo (Southwest Jiaotong University, P.R. China), Xing-Lai Ge (Southwest Jiaotong University, P.R. China) .....	5649
<i>Sensorless Control of PMSM using Voltage and Current Angle Estimation</i> Dong-Hee Lee (Kyungsoong University, Korea), JunHwi Park (Kyungsoong University, Korea) .....	5655

## SS: WBG Semiconductor Power Devices and its Applications (1-1)

<i>Series SiC MOSFETs with Single Gate Driver Based on Capacitance Coupling and Passive Snubber Circuits</i> Zhe Wang (Tsinghua University & Tsinghua University, P.R. China), Zedong Zheng (Tsinghua University, P.R. China), Yongdong Li (Tsinghua University, P.R. China) .....	5660
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------

<i>Designing a SiC MOSFETs Gate Driver with High dv/dt Immunity and Rapid Short Circuit Protection for xEV Drivetrain Inverter</i>	
Hao Zhou (South China University of Technology, P.R. China), Chunxian Ye (Shenzhen Advantage Power Limited, P.R. China), Xubiao Zhan (Shenzhen Advantage Power Limited, P.R. China), Zhenmin Wang (South China University of Technology, P.R. China)	5666
<i>Suppressing Method of Common-Mode Noise in MHz 380V-12V DCX Converter</i>	
Yue Han (Zhejiang University, P.R. China), Xinke Wu (Zhejiang University, P.R. China), Hongbo Shi (Zhejiang University, P.R. China)	5671
<i>A Delay Compensation Control Method Based on Interleaved Dual BUCK Full Bridge Grid-connected Bidirectional Converter</i>	
Yulu Cui (Tianjin University, P.R. China), Yifeng Wang (School of Electrical Engineering and Automation, P.R. China), Xiaoyong Ma (Tianjin University, P.R. China)	5675
<i>A High Frequency 40kW Step-Up Converter for Fuel Cell Electrical Vehicles Based on SiC MOSFET</i>	
Xiaoyong Ma (Tianjin University, P.R. China), Yifeng Wang (School of Electrical Engineering and Automation, P.R. China), Ping Wang (Tianjin University, P.R. China)	5680

## Machines System Modeling (1-1)

<i>Impedance Modeling of Virtual Synchronous Control of Doubly-Fed Wind Power System Under Weak Grid Condition</i>	
Tian Yang (Chongqing University, P.R. China), Hui Li (Chongqing University, P.R. China), Kun Wang (Chongqing University, P.R. China), Yu Hu (Chongqing University, P.R. China), Zhaosen Chai (Chongqing University, P.R. China), Guisen Xia (Chongqing KK-QIANWEI Wind Power Equipment Co., P.R. China)	5686
<i>Analytic Algorithm for Calculation of Saturated Inductances of Brushless Doubly-Fed Machine</i>	
Bin Wang (Chongqing University, P.R. China), Li Han (Chongqing University, P.R. China), Renxiao Wang (Chongqing University, P.R. China), Ningning Yang (Chongqing University, P.R. China), Pu Zhao (Chongqing University, P.R. China)	5692
<i>Data-driven Fault Diagnosis of Induction Motors Using a Stacked Autoencoder Network</i>	
Audun Skyllvik (University of Agder, Grimstad, Norway), Kjell Robbersmyr (University of Agder, Norway), Khang Huynh (University of Agder, Norway)	5698
<i>DC-link Stability and Modeling of Inverter-IM Vector Control System Based on LTP Theory</i>	
Weixin Sun (Southwest Jiaotong University, P.R. China), Xing-Lai Ge (Southwest Jiaotong University, P.R. China)	5704
<i>Modified Current Regulator for High-Power Traction Motor with Low Sampling Frequency to Operating Frequency Ratio</i>	
Lei Chen (Zhejiang University, P.R. China), Xiaoqing Wang (Zhejiang University, P.R. China), Changjin Liu (Leadrive Technology (Shanghai) Co., Ltd., P.R. China), Yuxin Xia (Leadrive Technology (Shanghai) Co., Ltd., P.R. China), Min Chen (Zhejiang University, P.R. China), Rik W DeDoncker (RWTH Aachen University, Germany)	5709

## Permanent-Magnet Motors and Drives (14-14)

<i>Electromagnetic Performance Analysis of Interturn Short Faults in Permanent Magnet Synchronous Machine with Variable Flux Hybrid Rotor</i>	
Xuanyang Hu (Beihang University, P.R. China), Hao Qian (Beihang University, P.R. China), Wenyuan Qin (Beihang University, P.R. China), Qinling Zhang (Beihang University, P.R. China), Chuliang Zheng (Beihang University, P.R. China)	5715
<i>Magnetic Circuit Model and Finite Element Analyze for Stator Excitation Transverse Flux High Speed Permanent Magnet Machine</i>	
Jiesheng Liang (Shenyang University of Technology, P.R. China), Guangwei Liu (Shenyang University of Technology, P.R. China), Fengge Zhang (Shenyang University of Technology, P.R. China), Shi Jin (Shenyang University of Technology, P.R. China), Dapeng Wang (Shenyang University of Technology, P.R. China), Liang Bingxue (School of Information Science & Engineering, Northeastern University, P.R. China)	5720
<i>Concept and Electromagnetic Design of a New Axial Flux Hybrid Excitation Motor for In-wheel Motor Driven Electric Vehicle</i>	
Weiwei Geng (Nanjing University of Science and Technology, P.R. China)	5725
<i>Research on Electromagnetic Performance of a Novel Hybrid-PM Variable-Flux Machine</i>	
Mingqiao Wang (Harbin Institute of Technology, P.R. China), Chengde Tong (Harbin Institute of Technology, P.R. China), Guangyuan Qiao (Harbin Institute of Technology, P.R. China), Faliang Liu (Harbin Institute of Technology, P.R. China), Jiayu Guo (Harbin Institute of Technology, P.R. China), Ping Zheng (Harbin Institute of Technology, P.R. China)	5731

<i>Dual Permanent Magnet Synchronous Motor Drive with a Fault-tolerant Inverter based on an Improved Width Modulation Scheme</i>	5736
Hai Lin (Chang'an University, P.R. China), Wenhan Li (Chang'an University, P.R. China), Bo Hu (Chang'an University, P.R. China), Jinping Chen (Chang'an University, P.R. China), Jie Li (Chang'an University, P.R. China), Fei Zhao (Harbin Institute of Technology (Shenzhen), P.R. China)	

## Transportation and Other Applications (1-1)

<i>Analysis of compensation component errors for LCC resonant dynamic wireless power transfer system</i>	5741
Chunbo Zhu (Harbin Institute of Technology, P.R. China), Shaocong Zhou (Harbin Institute of Technology, P.R. China), Shuai Dong (Harbin Institute of Technology, P.R. China), Shumei Cui (Harbin Institute of Technology, P.R. China), CC Chan (University of Hongkong, Hong Kong), Leran Zheng (Harbin Institute of Technology, P.R. China)	
<i>Electromagnetic Performance Analysis of a novel Hybrid Excitation Eddy current Retarder for Heavy Vehicles</i>	5746
Wenguang Guo (Beijing University of Technology, P.R. China), Desheng Li (Beijing University of Technology, P.R. China), Lezhi Ye (Beijing University of Technology, P.R. China)	
<i>A Unified Criterion for Integral On-board Charger of Electric Vehicles Using Propulsion System</i>	5750
Shaomin He (Zhejiang University, P.R. China), Huan Yang (Zhejiang University, P.R. China), Enlong Wang (Zhejiang University, P.R. China)	
<i>Three-Dimensional Numerical Analysis of Excitation Coil of Forced Oil-Cooled Magnetic Separator</i>	5756
Yubo Zhang (Institute of Electrical Engineering Chinese Academy of Sciences, P.R. China), Wang Yibo (Institute of Electrical Engineering, Chinese Academy of Science, P.R. China), YU Zhou (Institute of Electrical Engineering, P.R. China), JianHong Guo (Institute of Electrical Engineering Chinese Academy of Sciences, P.R. China), Huan Wang (Institute of Electrical Engineering Chinese Academy of Sciences, P.R. China)	
<i>An Approach to Suppress Low-Frequency Oscillation in Traction Network of High-Speed Railway Based on Improved Sliding Mode Variable Structure and Passive-Based Control</i>	5761
Sitong Chen (School of Automation & Electrical Engineering, Lanzhou Jiaotong University, P.R. China), Ying Wang (School of Automation & Electrical Engineering, Lanzhou Jiaotong University, P.R. China)	

## Power converters (8-8)

<i>Study on different input connections' effect of step-up switched capacitor AC-AC converters</i>	5767
Weifeng Wang (Zhejiang Electric Power Corporation, P.R. China), Hongtao Chen (China Jiliang University, P.R. China), Hui Cai (China Jiliang University, P.R. China), Zixing Zhang (China Jiliang University, P.R. China), Enhui Zheng (China Jiliang University, P.R. China)	
<i>Selective control algorithm for Nphase switching power pole of 4leg interlinking converter in ACDC Hybrid Microgrid</i>	5772
Mina Kim (Sungkyunkwan Univ, Korea), Bong Yeon Choi (Sungkyunkwan University, Korea), Jung-Min Park (Sungkyunkwan University, Korea), Kyung-Min Kang (Sungkyunkwan University, Korea), Kyoung-Min Choo (Sungkyunkwan Univ Korea, unknown), Chung-Yuen Won (Sungkyunkwan University, Korea)	
<i>Model free predictive control for power decoupling integrated PFC converters</i>	5777
Xikang Dong (Hefei University of Technology, P.R. China), Hongmei Li (Hefei University of Technology, P.R. China), Hengguo Zhang (Hefei University of Technology, P.R. China), Jiayuan Gu (Hefei University of Technology, P.R. China), Chen Pan (Hefei University of Technology, P.R. China), Liwen Liu (Hefei University of Technology, P.R. China)	
<i>Control and Experiment of Advanced Traction Power Supply System Based on 15+1 NPC Cascaded Converter Modules</i>	5782
Pengcheng Han (Southwest Jiaotong University, P.R. China), Haijun Ren (Southwest Jiaotong University, P.R. China), Haolun Yu (Southwest Jiaotong University, P.R. China), Xiaoqiong He (Southwest Jiaotong University, P.R. China), Shibin Gao (Southwest Jiaotong University, P.R. China)	
<i>Research on the Minimum Backflow Power Control Strategy of Full-Bridge Three-Level DC-DC Converter</i>	5786
Keyu Pan (Southwest Jiaotong University, P.R. China), Zhiqin Zhao (Southwest Jiaotong University, P.R. China), Zi Liu (Southwest Jiaotong University, P.R. China), Pengcheng Han (Southwest Jiaotong University, P.R. China), Xiaoqiong He (Southwest Jiaotong University, P.R. China), Haijun Ren (Southwest Jiaotong University, P.R. China)	

## Linear Machines and Magnetic Levitations (3-3)

<i>Analysis of Eddy Current Braking Characteristics of High Speed Maglev Train Based on Dynamic Change of Skin Effect and Operating Speed</i> Junci Cao (Beijing Jiaotong University, P.R. China), Yihuang Zhang (University of New South Wales, P.R. China), Ruini Li (Beijing Jiaotong University, P.R. China), Yufeng Pan (Beijing Jiaotong University, P.R. China), Yu Wang (Beijing Jiaotong University, P.R. China) .....	5792
<i>Analytical Modeling and Thermal Effect Analysis of Electromagnetic Rail Launcher</i> Feifei Yan (Naval University of Engineering, P.R. China) .....	5797
<i>Experimental Verification of a Consequent-pole Magnetic Lead Screw</i> Tetsuya Abe (Osaka University, Japan) .....	5802
<i>Development of Triaxial Active Control Magnetic Bearing with Asymmetric Structure</i> Akira Heya (Osaka University, Japan), Katsuhiro Hirata (Graduate School of Engineering, Osaka University, Japan), Noboru Niguchi (Osaka University, Japan), Atsushi Nakajima (Osaka University, Japan) .....	5806
<i>Energy Consumption Braking Characteristics Analysis for Multi-Car Elevator System</i> Yan Gao (Henan Polytechnic University, P.R. China), Xiaozhuo Xu (Henan Polytechnic University, P.R. China), Jianfeng Lu (Henan Polytechnic University, P.R. China), Sun Zhen (Henan Polytechnic University, P.R. China), Shengli Chen (Henan Polytechnic University, P.R. China), Zhuli Liu (Henan Polytechnic University, P.R. China) .....	5812

## Special Machines and Actuators (2-2)

<i>A Study on a Computation Method of the Loop Variance of Hysteresis Motors after Entering Synchronous Speed</i> Sun-Ki Hong (Hoseo University, Korea), Ji-Hoon Han (Hoseo University, Korea), Dong-Jin Choi (Hoseo University, Korea), Sang-Uk Park (Hoseo University, Korea) .....	5818
<i>Research on the Reactive Power Regulation Capability of Stator DC Current Excited Vernier Reluctance Machine</i> Shaofeng Jia (Xi'an Jiaotong University, P.R. China), Kuankuan Yan (Xi'an Jiaotong University, P.R. China), Deliang Liang (Xi'an Jiaotong University, P.R. China), Jinjun Liu (Xi'an Jiaotong University, P.R. China) .....	5822
<i>Research on Voice Coil Motor for a new construction with wireless power supply</i> Weikang Huang (Nanjing University of Aeronautics and Astronautics, P.R. China) .....	5827
<i>Electromagnetic Design of Novel Double-Stator Low-Speed Large-Torque Synchronous Motor with Hybrid Rotor</i> Shi Jin (Shenyang University of Technology, P.R. China), Xiaojie Jing (Shenyang University of Technology, P.R. China), Zhaoyu Zhang (Shenyang University of Technology, P.R. China), Jinxing Liu (Shenyang University of Technology, P.R. China), Fengge Zhang (Shenyang University of Technology, P.R. China) .....	5833
<i>Design and Analysis of a Six-Degree-of-Freedom Oscillatory Actuator</i> Tomoaki Mototsuji (Osaka University, Japan), Katsuhiro Hirata (Graduate School of Engineering, Osaka University, Japan), Akira Heya (Osaka University, Japan) .....	5838

## Additional Paper

<i>Analysis of Winding Configurations and End Magnetic Leakage Shielding in Joint Motors</i> X. Li, L. Yu, L. Chen, Y. Zhang, Y. Ding and D. Li (Shanghai Marine Equipment Research Institute - SMERI, Shanghai, China) .....	5843
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------