

# **2023 IEEE 4th China International Youth Conference On Electrical Engineering (CIYCEE 2023)**

**Chengdu, China  
8-10 December 2023**

**Pages 1-511**



**IEEE Catalog Number: CFP23X34-POD  
ISBN: 979-8-3503-0557-9**

**Copyright © 2023 by the Institute of Electrical and Electronics Engineers, Inc.  
All Rights Reserved**

*Copyright and Reprint Permissions:* Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

***\*\*\* This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP23X34-POD
ISBN (Print-On-Demand):	979-8-3503-0557-9
ISBN (Online):	979-8-3503-0556-2

**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

## TABLE OF CONTENTS

Self-Organized Criticality Identification of Power Systems Based on Neural Networks..... 1 <i>Weidong Zhong, Jicai Liu, Qianyuan Zhong, Ping Hu, Chengping Hu, Yilin Liu</i>	1
Study of Transformer Winding Vibration Characteristics Under Electromagnetic Field and Structural Force Field..... 7 <i>Zhijie Wang, Zhuyu Shao, Shuofeng Niu, Bin Jia, Xiaodong Chen, Xiaowen Dai</i>	7
Velocity Control of Electromagnetic Pellet Injection Based on Genetic Algorithm in J-TEXT..... 13 <i>Zisen Nie, Zhongyong Chen, Wei Yan, Shengguo Xia, Yinlong Yu, Guina Zou, Fanxi Liu</i>	13
Challenges and Solutions in Integrating Large-Scale Photovoltaic Systems with Weak Electrical Grids..... 19 <i>Ke Liu, Yutong Liu, Jun Han, Wenqian Zhang, Han Guo</i>	19
Research on Two-Dimensional Thermal Network of a Coreless Axial Flux Permanent Magnet Synchronous Motor for Flywheel Energy Storage ..... 24 <i>Kexin Yao, Caiyong Ye, Shanming Wan</i>	24
Circuit Breaker Target Sound Signal Detection Method Based on VAD and SVDD Algorithms ..... 31 <i>Zhencheng Yang, Jincheng Dai, Maosen Guo, Yi Zhang, Zaijun Wu</i>	31
Variable Time Scale Optimization of Distribution Network for Distributed Photovoltaic Access ..... 36 <i>Zongbo Yu, Shishan Xu, Xianglong Li, Qiang Guo, Ning Zhu, Qiuping Kang, Erkang Gao</i>	36
Impact of Distributed Photovoltaic Power Generation on Distribution Network Voltage..... 42 <i>Zongbo Yu, Xianke Xu, Wen Yan, Ning Zhu, Xianglong Li, Erkang Gao, Qiuping Kang</i>	42
Optimized Operation Strategy of Source-Load-storage Multi-resource Interaction in Active Distribution Network..... 49 <i>Guojing Dong, Wenbin Cai, Yuan Wang, Kaiyang Song, Xianglong Liu, Qiuping Kang</i>	49
A Smooth Recovery Method for Asymmetrical Load Short-Circuit Fault of Three-Phase Three-Wire Inverters..... 55 <i>Jian He</i>	55
A Unified Model to Compare Stability of VSG and Current-Controlled Inverter Connected to Weak Grid..... 61 <i>Xin Jiang, Hao Yi, Peng Yu, Yihan Xie, Deshuo Yu, Zhilong Zhang</i>	61
Intelligent Optimization Method for Time Period of Power Grid Operation Based on Knowledge Model ..... 68 <i>Gaohan Lu, Nanyang Zhu, Kaifeng Zhang, Zemei Dai</i>	68
An Optimized Light-Load Efficiency Scheme for LLC Converters Based on Variable Ratio Transformer ..... 75 <i>Tianqi Lv, Yundong Gu, Xinghong He, Ruikun Mai, Yang Chen</i>	75
Modeling and Analysis of Concrete-Air Cross-media Wireless Power Transfer Systems ..... 80 <i>Cancan Rong, Jin Chang, Zunyang Liu, Yunpeng Xu, Zhi Ling, Kaiping Qu</i>	80
Control Strategy of Modular Multilevel Matrix Converter Under Unbalanced Input Voltages..... 86 <i>Yiyang Ji</i>	86

A Modeling and Control Method for Modular Multilevel Matrix Converter in Fractional Frequency Transmission Applications .....	93
<i>Jinyang Gao</i>	
Life Expectancy Characteristics of Digital Relay Protection Devices.....	100
<i>Jie Gong, Yudong Fang, Xinsen Xu, Xidong Xu</i>	
An Innovative Protection Method for Power Collector Lines in Wind Farms .....	105
<i>Jinjin Ding, Feng Zhang, Yu Xia, Tao Jiang, Hui Sun, Bo Peng, Shenxing Shi</i>	
Influence of Stray Current on Distance Protection in Rail Transit .....	110
<i>Ruxue Zhao, Guxin Zhang, Hongmei Gao, Yizhen Sui, Hongbin Zhang, Hongshun Liu, Qingquan Li</i>	
Carbon Flow Tracing Method for Power Systems Based on Complex Power Distribution Matrix .....	117
<i>Bailin Zhang, Chong Shao, Kaili Han</i>	
Low Carbon Dispatch Strategy for Power System Based on Spatio-Temporal Distribution of Flexibility Resources .....	122
<i>Xianming Yang, Bo Wei, Jinguo Zhao</i>	
Construction of Carbon Emission Evaluation Indicator System Based on Regional Energy Information Data .....	127
<i>Chong Shao, Honglei Xu, Rui Yang</i>	
Optimal Operation of Energy Storage Units with Efficiency Improvement and State of Charge Balance .....	132
<i>Xiangchen Zhu, Yanbo Wang, Di Cao, Yue Zhang, Yunwei Li, Zhe Chen</i>	
Analysis of the DC-Link Capacitor Ripple Current for Neutral-Point-Clamped Three Level Inverter.....	138
<i>Xiaosa Sui, Deliang Wu</i>	
Design of a 105 GHz Notch Filter Based on the Frequency Selective Surfaces .....	145
<i>Yifei Huang, Donghui Xia, Yong Yang, Bo Rao</i>	
Space-Utilization Multi-Mode Quasi-Static Resonant Cavity Wireless Power Transfer for Fully Enclosed Arbitrary Regions.....	151
<i>Cancan Rong, Qiong Wang, Yingzhou Guo, Xiaoyu Duan, Lihui Yan, Mengmeng Chen, Jin Chang, Chenyang Xia</i>	
500kV Transmission Tower Safety Assessment Under Foundation Erosion by River Water.....	156
<i>Li Zhang, Zhiqiang Feng, Yu Shen, Xueming Zhou, Yao Yao, Xiaopeng Liu</i>	
Analysis of the Influence of Different Factors on the Lightning Withstanding Current.....	162
<i>Xiaopeng Liu, Jianjin Fu, Xueming Zhou, Yao Yao, Zhiqiang Feng, Li Zhang</i>	
Rotor Parameter Sensitivity Analysis and Electromagnetic Performance Optimization of PMASynRM.....	168
<i>Zhentian Zhu, Aiyuan Wang, Ming Tang</i>	
Research on Structural Heterogeneity of Power Network with Electric Vehicle Charging Load.....	174
<i>Yeqing Zhang, Xu Liu, Zijian Wan, Qi Tian, Wenli Fan, Chuan Long</i>	
Research on Vulnerability Assessment Method of Electric Power Network Based on Graph Neural.....	181
<i>Zijian Wan, Xu Liu, Yeqing Zhang, Yan Wang, Yida Zeng</i>	

Hypergraph Modeling and Vulnerability Assessment of Power Network .....	186
<i>Qi Tian, Zixuan Liu, Yeqing Zhang, Shengyuan Yang, Wenli Fan</i>	
Optimal Allocation of Static and Dynamic Charging Facilities for Electric Vehicles .....	192
<i>Xianfeng Xu, Jingjie Yao, Zhen Zhang, Yong Lu, Zhixiong Ma</i>	
A Multiload WPT System with CC/CV Output Based on LCC-S Topology for UAV Clusters .....	198
<i>Haibing Wen, Jiadong Yang, Jiayuan Li, Peng Wang, Xiaolong Zhou, Lei Yang, Xiangqian Tong</i>	
Load Frequency Control Strategy for Two-Area Power System Considering Deep Reinforcement Learning Algorithm .....	204
<i>Yudong Liang, Bin Zhao, Xiaoqin Hao, Li Zhang, Weiheng Wang, Li Fu</i>	
Research on Digital Diagnosis of Switchgear Based on Integration of Virtuality and Reality.....	210
<i>Guoqiang Su, Hejin Liu, Xiangyu Wen, Feng Wang, Yang Liu, Shidong Zhang, Xinbin Zuo</i>	
Non-Contact Voltage Measurement Technology Based on Dual Coupling Mechanism Displacement Current Method .....	216
<i>Yinke Peng, Ling Fu, Yongjie Ye, Hao Li</i>	
Research of HVAC Novel Fault Current Limiter Electromagnetic Field Coupling Considering the DC Component of Short Circuit Current.....	222
<i>Jiawei Liu, Jiaxin Yuan, Hang Zhou, Xuzhe Li, Wanting Zhang, Jinhai Zhou</i>	
Small Power Litz Wire Ferrite Inductor Loss Model Based on Neural Network .....	229
<i>Huizhong Sun, Ming Yang, Zhihao Lin, Ning Wang, Ariya Sangwongwanich, Huai Wang</i>	
Nonlinear Intra-Multiple Frequency Internal Resonance in Grid-connected Inverters Based on General Forced Oscillations .....	235
<i>Fang Liu, Bingshu Hou, Yan Li, Bo Liu</i>	
Remote Real-Time Monitoring System for Power Quality Using 5G Synchronous Waveform Collection .....	241
<i>Bin Zhao, Dongxue Ma, Boheng Xu, Jing Cai, Zhao Yu, Yaqi Yang</i>	
Temperature Prediction of Substation Distribution Cabinet Based on CNN-BiGRU Model with Attention Mechanism .....	246
<i>Ping Hu, Junchen Lu, Yuan Cui, Bo Hu, Fan Liang</i>	
Design of Post-Assembly Magnetization System of the Rotor of Disk Coreless Permanent Magnet Motor Based on Halbach Array .....	252
<i>Xia Li, Yiliang Lv, Lei Lv, Zhang Tu, Ronggang Chen, Liang Li</i>	
Design and Experimental Validation of a Repetitive Pulse Magnetic Field System .....	259
<i>Wen Wang, Guangshuai Zhang, Shaobo Liu, Zhiming Song, Ping Wu, Jun Sun, Tao Peng, Hongfa Ding</i>	
Calculation of the Transition Resistance During Single-Phase-to-ground Fault Based on Fault Recorder Data: Basic Theory, Error Analysis and Verification .....	265
<i>Xiankang Wang, Xueming Zhou, Jianjing Fu, Zijian Li, Liang Chen, Jie Chen</i>	
Non-Destructive Testing Method for Breakdown Strength of XLPE Cable Insulation: Near-infrared Spectroscopy .....	269
<i>Xuyang Zhao, Shengyi Xie, Fangfang Wu, Yibo Gao, Zhigang Ren, Haoran Sui, Haoyue Jiang, Jianying Li</i>	

Prediction of Elongation at Break of XLPE Cable Insulation by Near-Infrared Spectroscopy .....	274
<i>Xuyang Zhao, Shengyi Xie, Fangfang Wu, Yibo Gao, Zhigang Ren, Haoyue Jiang, Zichao Yang, Jianying Li</i>	
Mechanical and Thermal Analysis of a 5MW Double-Stator Single-Rotor PMSG for Direct Offshore Wind Turbines .....	279
<i>Warda Gul, Qiang Gao, Muhammad Uzair Adeem, Fei Gao</i>	
Parameter Design Method for CCM in Double-Sided LC WPT System.....	287
<i>Yongchao Wang, Jin Tao, Bo Luo, Ruikun Mai</i>	
The Wave Coupling Simulation Result of ICRF Antenna in J-TEXT Relying on the Perfectly Matched Layer Technique .....	292
<i>Xinyu Cao, Zhonghe Jiang, Donghui Xia</i>	
A Study of Water Spillage of Small Hydropower Based on Copula Function .....	298
<i>Hongji Yang, Yikai Sun, Jie Gong, Changlin Xiao</i>	
Design of Pulse Power Supply for Nonlinear Kicker of Synchrotron Radiation Light Source .....	304
<i>Bing Zhu, Jiahao She, Yuan Liu, Xulong Wang, Xiaofei Li, Jun Yang, Kuanjun Fan</i>	
Inverse Design of Electromagnetic Induced Transparency Metamaterials Based on Generative Adversarial Network .....	311
<i>Xingyu Zhou, Peishuai Tian, Yanqi Hu, Qitai Sun, Yongqian Xiong</i>	
Research on the Electromagnetic Interference of Scanning Magnet Magnetic Field to Cable in Proton Therapy .....	317
<i>Xinyi Shen, Ping Tan, Xinze Wang, Yinjie Lin, Songbin Chen, Haimin Xiong, Zhihong Qian</i>	
Scan Path Optimization of Discrete Scanning Based on HE-GA in Proton Therapy .....	324
<i>Xinze Wang, Ping Tan, Xinyi Shen, Yinjie Lin, Songbin Chen, Haimin Xiong, Zhihong Qian</i>	
Design of Wireless Separately Excited DC Motor Speed Control System.....	331
<i>Huibao Li, Shuai Dong, Keyu Lin, Xiaorui Wang</i>	
RNN-Based Photovoltaic Power Identification Method for Distribution Networks .....	336
<i>Can Wang, Yanjian Peng, Shihan Wang, Chang Li, Yong Li, Jiayan Liu</i>	
Frequency Response Characteristics of Autotransformer Split Windings Under Typical Faults.....	341
<i>Junxian Dong, Yong Kang, Jingwu Su, Nan Chen, Yutian Lei, Hongbo Wang</i>	
Research on the Substation Alarm Event Model Based on Natural Language Parsing Technology .....	346
<i>Xiaomeng Li, Hualiang Zhou, Zhantao Su, Yifeng Wang, Yuxin Chen, Lu Lu, Jing Wang</i>	
Control Strategy of Hybrid Distribution Transformer with Photovoltaic Power and Energy Storage.....	352
<i>Libo Fan, Minhao Jin, Jiabin Huang, Shichao Li, Yibin Liu, Zihan Kong, Deliang Liang</i>	
Optimization of BiLSTM for PV Output Prediction Based on Hybrid Bat Algorithm.....	358
<i>Mengxiang Ding, Wenli Fan, Zixuan Liu, Shengyuan Yang, Selamat Mesfin, Shengyong Ye</i>	
Research on Real-Time Power Matching Problem in Stepping Up from Zero Based on Self-Synchronous Voltage Source .....	364
<i>Xingang Yang, Yuqi Wen, Jun Gu, Liang Cao</i>	
A Subzone Formation Strategy for Load Restoration in Resilient Distribution Systems .....	370
<i>Jihang Cheng, Zhongqi Guo, Xiaojian Huang, Haoming Liu</i>	

A Method Dealing with the Class Imbalance Problem in Transient Stability Assessment: Combining ADCHSMOTE-TL and Lifting Dimension Linear Regression .....	375
<i>Tao Liu, Jinfu Chen, Defu Cai, Erxi Wang, Dian Xu</i>	
A Digital Twin System for Comprehensive and Dynamic Temperature Rise Sensing of Current- Limiting Reactors .....	382
<i>Jiayuan Zhou, Haitao Wang, Shangui Chen, Peng Tian, Lin Zhang, Chengbing Zhang</i>	
Modelling and Control of the Reconfigurable Converter for the Retired Battery .....	389
<i>Ning Wang, Weihao Hu, Yanbo Wang, Yubo Han, Zhe Chen</i>	
Analysis and Design of Multiple Relay WPT System Embedded in Composite Insulator.....	395
<i>Ruiqing Sun, Yueshi Guan, Chang Liu, Yijie Wang, Dianguo Xu</i>	
Research on Multi-Sensor Fusion Positioning and Navigation of Substation Inspection Robot Based on Beidou RTK and 3D Laser.....	401
<i>Changwang Shan, Lu Lu, Hualiang Zhou, Zhantao Su, Ying Dai, Ting Su, Juntian Pei</i>	
Research on Multi-Modal Feature Extraction and Covolutional Neural Network for Deterioration Identification of GIS Equipment .....	407
<i>Lu Lu, Shan Changwang, Zhou Hualiang, Su Zhantao, Sun Han, Li Xiaomeng, Wang Yifeng</i>	
Interfacial Breakdown Characteristics and Its Physical Model of Cable Accessories Under Multiphysics Fields .....	414
<i>Tianfeng Zhang, Yunxiao Zhang, Xin Zheng, Wenxin Lin, Zhengnan Chi, Jiarui Zhang</i>	
Analysis of Household Electric Vehicle Electricity Use Behavior Based on Non-Intrusive Monitoring.....	419
<i>Yafei Wu, Yan Tao, Yu Nan, Sichen Shi, Shu Zhang</i>	
Adaptive Control of Electromagnetic Levitation System Considering Input Unidirectionality and Parameter Uncertainty .....	424
<i>Fengxing Li, Yougang Sun, Zhao Xu, Fuchuan Duan</i>	
Selection of Bidirectional DC-DC Topology for DC Microgrid Energy Storage Systems.....	431
<i>Quan Ren, Yang Han, Ping Yang, Congling Wang</i>	
A Method for Calculating the Growth Rate of Resistive Current and Fault Diagnosis of MOA Based on Synthetic Vector.....	438
<i>Gaoming Wang, Hualiang Zhou, Zhantao Su, Ying Dai, Yong Wang, Shuai Fu, Yiliu Xu, Jin Huang</i>	
A Novel Transient Bus Protection Algorithm Based on HHT .....	444
<i>Zhenwei Guo, Yongyan Jiang, Yi Luo, Xing Xie, Qian Huang</i>	
Research on Test Technology of Substation Connected to Centralized Monitoring System Under New Energy Background.....	449
<i>Jingjing Yu, Yongkang Zheng, Hao Wu, Haidong Wang, Mengli Li, Wenbing He</i>	
Self-Organized Criticality Identification of Power System Based on SC-GCN Network .....	457
<i>Liyang Liu, Yuqi Han, Shengyong Ye, Chuan Long, Zixuan Liu, Xuna Liu, Ting Li, Xinting Yang, Da Li</i>	
Small Signal Modeling of Sending-End Offshore Wind Power MMC-HVDC Integration System Considering Positive and Negative Sequence Separation Module .....	462
<i>Yijing Chen, Zhiwei Peng, Chunhua Li, Weihong Song, Junyang Zhang, Yingbiao Li</i>	

Coupled Electromagnetic-Thermal Analysis of a Dry-Type Power Transformer.....	468
<i>Peng Tian, Hongwei Jiang, Cheng Yang, Shuwei Zheng, Guizong Wang, Chengbing Zhang</i>	
Study on the Loss Characteristics of Dry-Type Power Transformers Considering Stray Losses .....	473
<i>Cheng Yang, Hao Hu, Peng Tian, Jingwei Shi, Zhenya Wang, Chengbing Zhang</i>	
Modeling and Analysis of AC Distribution Grids with Wind and Solar Storage.....	478
<i>Chuan Long, Shengyong Ye, Xinting Yang, Yuqi Han, Yan Wang, Ting Li, Liyang Liu, Xuna Liu, Da Li</i>	
Lightning Breakdown Macroscopic Behavior Analysis of Three-Element Mixed Insulation Oil-Paper System .....	484
<i>Hongwei Li, Jian Hao, Hanting Zhang, Xiong Liu, Wei Qin, Wenyu Ye, Junyi Zhang</i>	
High-Resistance Fault Localization Method for Underground Cables Based on Three-Dimensional Wideband Impedance Spectra .....	489
<i>Yuhao Lan, Kaining Kuang</i>	
Influence of Low Pass Filter on Wide-Frequency Oscillation of Power-electronic-integrated Distributed Generations.....	495
<i>Minghao Fan, Changan Ji, Qunjing Wang, Xiaoming Wang, Guoli Li, Wenguang Zhao, Qiang Li, Yaqian Yang</i>	
Research on Multi-Coils Wireless Power Transfer System Based on Insulator with Flanges .....	500
<i>Yang Liu, Fuyao Yang, Yu Han, Jie Gao, Hao Sun, Cong Wang, Yueshi Guan</i>	
Block Chain Based P2P Energy Trading Strategy in Power Retail Market for MVPPs.....	506
<i>Junjie Li, Yihan Wang, Kun Wang, Kan Yang, Qiuji Sun, Lingjie Ye, Wenxiang Li</i>	
Reliability Evaluation of Distribution Network Based on Time-Series Production Simulation and Improved AFT-RSVM.....	512
<i>Xiangqian Yu, Jian Yu, Zhihua Xie, Tingting Wang, Yiyang Li</i>	
A Gate Current Detection for Short-Circuit Protection of SiC MOSFET .....	517
<i>Bo Hu, Zipeng Ke, Minmin He, Chao Zhang, Zeng Liu, Jun Wang</i>	
Broad-Scanning Linear Phased Array with Minimized Coupling for Wireless Energy Harvesting .....	522
<i>Tanvir Islam, Haleh Jahanbakhsh Basherlou, Naser Ojaroudi Parchin</i>	
MIMO Antenna Design with Dual-Polarization Characteristic for 5G Handheld Devices .....	526
<i>Tanvir Islam, Haleh Jahanbakhsh Basherlou, Naser Ojaroudi Parchin</i>	
The Research on the Effectiveness Evaluation Technology for the PD Sensing Components of the 220kV Cable Joint with Built-In Multi-Dimensional Sensing Elements.....	530
<i>Jianjun Yuan, Benhong Ouyang, Rong Xia</i>	
Metamaterial/Metasurface-Based Antenna with Improved Gain for Wireless Power Transfer Systems.....	535
<i>Tanvir Islam, Haleh Jahanbakhsh Basherlou, Naser Ojaroudi Parchin</i>	
Low-Profile Phased Array Dielectric Resonator Antenna for 5G Internet of Thing Applications.....	539
<i>Tanvir Islam, Naser Ojaroudi Parchin, Haleh Jahanbakhsh Basherlou</i>	
Reinforcement Learning-Based Control Study of Three-phase LCL-type Photovoltaic Grid-connected Inverter .....	543
<i>Changzhou Yu, Feng Xu, Haizhen Xu, Haiyang Diao, Long Shen, Jiaqiang Fu, Leilei Guo</i>	

A Lateral Rotation-Free IPT System with Overlapped Receiving Coils for Power Cable Sensors .....	549
<i>Wenhui Wang, Bohan Li, Yefei Xu, Hongzhou Zhang, Kuangyi Jiang, Yuan Li, Kai Zhou</i>	
An IPT-Based Voltage Equalizer with Voltage-Doublers for Battery-String Charging .....	554
<i>Bohan Li, Wenhui Wang, Yefei Xu, Lizhou Liu</i>	
Analysis and Design of Bidirectional Multilevel CLLLC Resonant Converter .....	559
<i>Yuchen Fang, Hui Sun, Yiming Li, Yongkang Wang</i>	
Coordinated Day-Ahead and Intra-day Operation of Distribution Networks Considering the Active Support of Distributed PV and Energy Storage System .....	566
<i>Qingyan Zhang, Jie Shang, Jian Wang, Haoming Liu</i>	
An Adaptive Real Coded Population-Based Incremental Learning Algorithm for Design Optimizations in Continuous Space .....	572
<i>Jian Yang, Yong Zhang, Linggang Zhou, Xin Lv, Yuntu Jiang, Qiuxiao Wang, Shiyong Yang</i>	
Performance Test of CuCrZr Wire for High Magnetic Field Pulsed Magnet .....	576
<i>Shaobo Liu, Tao Peng, Huidong Shang, Shuang Wang, Ziying Pan, Yihang Huang, Liang Li</i>	
Online Tuning Method for the Frequency Droop Control Parameter of a Wind Turbine Generator .....	582
<i>Tongxin Chen, Junchao Ma, Chenxu Wang, Yuqing Jin, Mengtian Xu, Ping Liu</i>	
The Improved Neural Network Algorithm is Applied in the Obstacle Avoidance Path Planning of Driverless Vehicles .....	588
<i>Xiyong Zhang, Shuyun An, Jingshuai Li, Jiachang Li, Xiaowen Li, Hongfeng Wang</i>	
Interfacial Thermal Resistance Measurement at Polymer/Semiconductor Interface Using Optical-Interference Contactless Thermometry (OICT).....	594
<i>Jiawen Yu, Hiroaki Hanafusa, Seiichirou Higashi</i>	
Spatio-Temporal Flexibility Evaluation of Electric Taxi Fleets Using Taxi Travel Data in Beijing.....	599
<i>Xiaocheng Gu, Xiaoyu Duan</i>	
Model Predictive Control of Three-Phase PWM Rectifier.....	605
<i>Qiang Zheng, Li Tian, Qingrui Wei</i>	
Considering the Optimal Input for Global Horizontal Irradiance Forecasting Based on Informer .....	610
<i>Chengcheng Jiang, Qunzhi Zhu</i>	
Electric Motor Bearing Fault Noise Detection with Mel-Transformer Model and Multi-Timescale Feature Extraction .....	615
<i>Xiaotian Zhang, Yunshu Liu, Chao Gong, Yu Nie, Jose Rodriguez</i>	
Optimal Placement of Phasor Measurement Unit in Active Distribution Network Considering Uncertainty and Soft Open Point.....	622
<i>Ruoyan Wang, Qilin Hou, Ningyi Dai, Peng Wang</i>	
Design of Electrical Control System for Multi-Station Modular Machine Tool.....	628
<i>Dan Li, Hongsheng Su</i>	
EMI in Sensorless PMSM Drive System Based on Disturbance Observer .....	634
<i>Yuanhe Xue, Wei Yan, Xuan Liu, Yang Zhao</i>	
Fault Diagnosis for High-Speed Railway Traction Network Based on Optimized Relief-F for Multi-layer Perceptron.....	639
<i>Qi Wang, Wenbo Zhou, Sheng Lin, Zhengyou He</i>	

Simulation Analysis of Intermittent Arcing Ground Faults in Urban Distribution Networks.....	645
<i>Ge Wang, Yuli Wang</i>	
Transient Stability Assessment of Power Systems with Graph Neural Networks Considering Global Features .....	649
<i>Shengyuan Yang, Mengxiang Ding, Zijianga Wtuan, Heaichuang Yang, Yilin Liu, Wenli Fan</i>	
A Comparative Analysis for Optimal Wind Farm Cluster Identification Using Hopkins Index and Silhouette Coefficient.....	655
<i>Siyu Tao, Victor Kimutai, Andrés Feijóo</i>	
Optimized Design of a Thermionic Electron Gun Applied to a High-Power FEL Injector .....	662
<i>Xiaoyu Peng, Tongning Hu, Yufei Peng, Jidong Long, Jianjun Deng, Guangyao Feng</i>	
Measurements of Electric Field in Atmospheric Pressure Argon Plasma Jet Under Different Active Gas Types and Concentrations by the E-FISH .....	668
<i>Yukun Yang, Jingyi Luo, Lanlan Nie, Xinpei Lu</i>	
1Design and Research of Active Inductor for Wireless Power Transfer System .....	674
<i>Bole Ma, Lin Chai, Jianghua Lu</i>	
A New Method for Defect Localization Based on Pisarenko Harmonic Decomposition .....	679
<i>Jie Feng, Daxing Wang, Xinghong Zhao</i>	
Game-Based Offshore Wind Farm Cluster Transmission System Topology Design.....	684
<i>Siyu Tao, Fuqing Jiang, Hao Ding, Andrés Feijóo, Victor Kimutai</i>	
2DPSK-Based Simultaneous Wireless Power and Data Transfer Using Frequency Division Multiplexing Technique.....	690
<i>Guangyu Yan, Wei Han, Chang Liu</i>	
Single-Phase Transformerless Two-Leg UPQC with Low DC-Link Voltage and Reduced .....	696
<i>Cen Tang, Jianglin Nie, Linghui Meng, Shun Wang, Zeliang Shu</i>	
A Novel Boost PFC Converter with Inherent Boundary Conduction Mode Operation.....	703
<i>Song Lu, Hongbo Ma, Tianyi Zhang, Lin Tang, Zhe Chen</i>	
Asynchronous Motor Fault Diagnosis Output Based on VMD-XGBoost.....	710
<i>Ming Tang, Aiyuan Wang, Zhentian Zhu</i>	
Influence of Discharge Circuit Parameters on the Efficiency of Reconnection Electromagnetic Launcher .....	717
<i>Wenlong Jiang, Liang Dong, Xin Zhao, Xiaokun Xie</i>	
Optimal Torque Distribution for Energy Consumption of Pure.....	724
<i>Xin Wang</i>	
Short-Term Metro Station Power Lighting Load Prediction Based on TimesNet .....	730
<i>Dong Zhang, Ruitian Wang, Yaxiang Fan, Chong Wang, Xin Chen</i>	
Optimal Traction Control for Heavy-Haul Train Using Dynamic Response Identification Model .....	736
<i>Kunpeng Zhang, Junjie Tang, Hui Yang, Zongqi Xu, Ming Jiang, Chunla</i>	
Heterogeneous Models Based Distributed Predictive Control for Heavy-Haul Trains .....	744
<i>Kunpeng Zhang, Can Hu, Hui Yang, Chunlan An</i>	

Enhanced Particle Filtering-Based Lifetime Prediction for IGBT in High-speed Trains .....	751
<i>Kunpeng Zhang, Wenjie Peng, Hui Yang, Chunlan An</i>	
Deep Learning -Based Remaining Life Prediction for DC-Link Capacitor in High Speed Train .....	758
<i>Kunpeng Zhang, Dingxin Liu, Hui Yang, Chunlan An</i>	
Analysis on Dynamic Characteristics of Wind Power Systems.....	765
<i>Jianyong Zhan, Xingrong Zhu, Xinjie He, Sisi Zhu</i>	
Insulator Defect Detection Based on Faster R-CNN and YOLOv3 Algorithm .....	770
<i>Ping Hu, Junchen Lu, Yuan Cui, Bo Hu, Fan Liang</i>	
A Frequency Domain Identification Method of General Mechanical Drive System.....	774
<i>Ruizhe Zhou, Ming Yang, Chaoyi Shang, Qiyang Zeng</i>	
Analysis on Pre-Charging of Auxiliary Resonant Capacitor of Resonant DC Link Inverter.....	781
<i>Si Li, Ming Yang, Tianyou Song, Dianguo Xu</i>	
Design of Magnetic Shielding Structures for Non-Contact Measurement of Current in Triangularly Arranged Cables .....	788
<i>Xingyu Zhou, Dongsheng Cai, Zhengyuan Zhang, Peng Wang, Arsalan Habib Khawaja, Qi Huang</i>	
Relative Calibration and Experimental Results of ECEI Near $q=1$ Surface on J-TEXT.....	795
<i>Qiang Luo, Zhoujun Yang</i>	
Measurement of Plasma Density Profile for Edge Plasma on J-TEXT Tokamak.....	801
<i>Ziyang Jin, Zhoujun Yang</i>	
Feature Identification Method for Abnormal Operations in Grid Dispatch Operations Based on Association Analysis .....	806
<i>Weiyuan Ma, Zhihua Wang, Yaqin Yan, Feng Gao, Kaifeng Zhang, Nanyang Zhu</i>	
Simulation on the Suppression Effect of External Passive Field on Runaway Electrons on J-TEXT .....	813
<i>Keze Li, Zhen Li, Zhonghe Jiang</i>	
Impurity Emissivity Tomographic Reconstruction by CCD Imaging System on J-TEXT .....	819
<i>Jiaming Wang, Zhipeng Chen, Zhifeng Cheng, Xin Xu, Xiaoqing Zhang</i>	
Study on Electric Field Distribution of Dampness Defect in Oil-Paper Capacitive .....	824
<i>Binbin Wei, Runze Qi, Bohao Peng, Xiaowen Dai, Shi Cao, Tong Zhao</i>	
Degradation Trajectories Prognosis for Fuel Cell Based on MP-NBEATS.....	830
<i>Yuxuan Zheng, Huiwen Deng, Jianjun Chen, Jiayang Hu, Weihao Hu</i>	
A Crosstalk Suppression Gate Driver for SiC MOSFET.....	835
<i>Qiyang Zeng, Ming Yang</i>	
Correlation Analysis Between Noise and Operating Parameters of Transformers with Different Rated Capacities .....	840
<i>Yinghui Du, Meiyang Wu, Limin Zhao, Guan Wang, Chunming Qiao, Yang Chen</i>	
Inverse Design of Electromagnetically Induced Transparency (EIT) Metamaterials Based on Autoencoder with Reconstruction Error.....	845
<i>Peishuai Tian, Xingyu Zhou, Yanqi Hu, Yongqian Xiong</i>	

Protection Method of DC Distribution Network Based on Current Mutation Integral.....	851
<i>Zhengchen Tao, Zhanjun Gao, Wenhao Jian</i>	
Optimal Design of 6kw High Frequency Transformer Using AP Method.....	857
<i>Yanyin Zhou, Bowen Luo</i>	
Exploration and Practice of CO <sub>2</sub> Emission Monitoring and Analysis Platform for Park Enterprises.....	862
<i>Xuewen Wang, Dinghao Liu, Jiayong Zhong, Wenxin Peng, Zhe Li, Jin Gao</i>	
The Design of Online Monitoring System for Resistive Leakage Current of Surge Arrester.....	867
<i>Caihong Guo, Liwei Wu, Jinping Wu, Ziqi Zhang, Zhenzhen Xie</i>	
Multi-Objective Optimization of Distribution Network System with Energy Storage and Distributed Photovoltaic Considering Static Voltage Stability .....	873
<i>Tianyu Hou, Lee Li</i>	
Fractional Order Dynamic Super-Twisting Terminal Sliding Mode Tracking Control for Linear Motor.....	879
<i>Xinyu Zhao, Limei Wang</i>	
A New Driving Compensation Strategy to Improve Current Symmetry of Integrated Buck-Boost-LLC Converter .....	886
<i>Jin Wen, Jiajia Guan, Zongheng Wu, Wenzhe Xu, Yue Wu, Zhipeng He, Cai Chen, Yong Kang</i>	
Stability Analysis of Co-Phase Traction Power Supply System Based on dq-Frame Impedance .....	893
<i>Feifan Liu, Lei Ma, Fulin Zhou, Shaokun Cheng, Yongyi Liao</i>	
Dynamic Behavior Characteristics of Bubbles in Oil Under Coupling of Multiple Physical Fields.....	898
<i>Luyao Liu, Hongbin Wu, Pengfei Lu, Hongzheng Liu, Mingming Han, Hongshun Liu, Qingquan Li</i>	
Dual-Resonant Step-Up AC/DC Converter Based on Fixed Frequency Pulse Overlapping Modulation .....	903
<i>Yubo Han, Weihao Hu, Di Cao, Yiping Yuan, Qi Huang</i>	
Research on Vehicle Rectifier Control Strategy Based on Reinforcement Learning.....	909
<i>Mingwei Tang, Bing Lu, Zhigang Liu</i>	
Microgrid Cybersecurity: Addressing Challenges and Ensuring Resilience .....	918
<i>Chaofeng Yan, Yang Han, Ping Yang, Congling Wang</i>	
Digital Filter Implementation: An Alternative to Improve the Estimation of the Level of Balls in Mills Used in the Mining Industry .....	925
<i>Esbany Lanchipa Sánchez, Julio López Seguel, Seleme Isaac Seleme, Lenin M. F. Morais</i>	
Development of Trigger Source for Surface-Triggered Vacuum Switch.....	931
<i>Yuhui Yao, Ling Dai, Shiqi Wang, Jing Lv, Fuchang Lin</i>	
Time Series Prediction of Day-Ahead Photovoltaic Power Based on Data-Driven .....	937
<i>Mingyue Zhang, Yang Han, Chaofeng Yan, Ping Yang, Congling Wang</i>	
Review of Research on Mechanical Direct Current Circuit Breakers .....	943
<i>Hang Zhang, Yaopeng Lu, Linying Cheng, Chuanliang Tan, Wenkui Liu, Yilin Li</i>	
A Capacity Configuration Model for User-Oriented Photovoltaic Energy Storage System.....	949
<i>Haojie Ma, Sen Zhang, Qi Huang, Rundong Liu, Weihao Hu</i>	

A Novel APF-Type Active Damper for SAPF System with Phase Reshaping .....	955
<i>Zhilong Zhang, Hao Yi, Shuaibin Shi, Qing Wang, Xin Jiang, Deshuo Yu</i>	
Modeling of Frequency Variation Characteristics Under Load Side Response of Transformers.....	961
<i>Xin Wang, Guochao Qian, Shun He, Hongwen Liu, Jin Hu, Weiju Dai, Kun Yang, Jialei Zang</i>	
Dynamic Ripple Tracking Method in DC Distribution Network.....	966
<i>Hongyan Li, Ling Fu</i>	
Study on Partial Discharge of Scratch Defects in Cable Terminal by X-Ray Excitation.....	973
<i>Minting Dai, Shusheng Zheng, Ju Kong, Chang Ye, Zhong Zheng</i>	
Design of a Dynamic Ridge Filter for Shortening Beam Delivery Time: A Simulation Study .....	978
<i>Benzhaoxia Yu, Xu Liu, Wei Wang, Bin Qin</i>	
Optimization Strategy for Multi-Microgrid Power Sharing Operation Considering Low-carbon Characteristics .....	983
<i>Mingcheng Dai, Lee Li</i>	
Stability Evaluation of the Dual-Terminal Structure DC Distribution Power Systems with Multiple DC Transformers .....	990
<i>Yangfan Chen, Mengyuan Zhao, Yu Zhang</i>	
Analysis of the Influence of Accelerator Grid Power Supply DC Bus on Output Voltage .....	996
<i>Zhenchang Du, Wentong Shang, Hongqi Zhang, Shaoxiang Ma</i>	
Suppression Method of Modulation Switching for the Inverter Oscillation Caused by Harmonic Control.....	1002
<i>Deshuo Yu, Hao Yi, Huaying Zhang, Xin Jiang, Zhilong Zhang, Yihan Xie</i>	
A VSG-Based Grid-Connected Photovoltaic Generation System with Hybrid Energy Storage.....	1009
<i>Yutong Liu, Hongtao Bu, Ke Liu, Xin Wang, Jun Han, Wenqian Zhang, Jinchao Zhao, Yinyong Xia, Han Guo</i>	
Review of Modeling, Analysis and Suppression Strategies for Wide-Band Oscillations in Microgrids .....	1014
<i>Ke Liu, Hongtao Bu, Yutong Liu, Xin Wang, Jun Han, Wenqian Zhang, Jinchao Zhao, Yinyong Xia, Han Guo</i>	

## **Author Index**