

2025 5th International Conference on Electrical Engineering and Control Science (IC2ECS 2025)

**Beijing, China
5-7 December 2025**

Pages 1–569

IEEE Catalog Number: CFP25DI8-POD
ISBN: 979-8-3315-7906-7



Copyright © 2025, IEEE

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:	CFP25DI8-POD
ISBN (Print-On-Demand):	979-8-3315-7906-7
ISBN (Online):	979-8-3315-7905-0

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA

Phone:	(845) 758-0400
Fax:	(845) 758-2633
E-mail:	curran@proceedings.com
Web:	www.proceedings.com

TABLE OF CONTENTS

Application of transfer learning algorithm based on Pre-trained Model in Rate of Penetration prediction	1
<i>Zhenxin Zhang, Han Meng, Botao Lin, Xueyin Han, Junjie Shentu</i>	
Arc Erosion Mechanism and Lifetime Prediction of Graphene-Silver-Spot Reinforced AgSnO ₂ Contact Materials	7
<i>Qiming Gao</i>	
Technology for Database Compression and Encryption Based on User Privacy Protection	11
<i>Yu Qin, Yanli Zhang, Lisai Wang</i>	
Identification of Energy Efficiency Bottlenecks in the Green Power-Coupled Water Electrolysis for Hydrogen Production and Ammonia Synthesis System	16
<i>Xinman Zhang, Feiyang Zheng, Lin Sun</i>	
Research Progress and Future Trends in Magnetic Induction Communication	27
<i>Kangjian Peng, Runqi Han, Yanqing Wei, Yinan Hu, Maoyin Chen</i>	
Research on UAV Three-Dimensional Modeling Based on Multi-Sensor Fusion	33
<i>Qiwen Deng, Long Gao, Fei Zhang</i>	
Rapid Quantitative Assessment of Dynamic Coupling Strength Between Renewable Energy Units	40
<i>Siqi Lyu, Ruihua Song, Daye Yang, Chao Zheng</i>	
A Photovoltaic Power Prediction Method Based on Improved Transformer and Continual Learning	45
<i>Kecheng Geng, Bihui Lv, Fang Liu, Wei Chen, Chaoran Zheng</i>	
Study on the energy scheduling strategy of a new energy microgrid cluster in an oilfield under the dual-carbon background	54
<i>Hao Xu, Li Ji, Jinghao Cai</i>	
Coordinated Operation of Power Distribution Network Considering Optimal Capacity Regulation of Distributed Energy Storage and Electric Vehicle Charging Stations	59
<i>Zhen Pan, Ke Li, Lijuan Huang, Hui Qin, Shizhong Zhang, Zhen Wu</i>	
Intelligent Control Strategies for Plunger Gas-Lifting: Current Research Status and Optimization Approaches for Enhanced Gas Well Production	66
<i>Weisong Liu, Runqi Han, Botao Lin, Nannuo Zeng, Han Meng, Wei Liu</i>	
A Revised Dynamic Electric Carbon Factor Calculation Method Integrated with Green Electricity and Green Certificate Trading	72
<i>Qingshen Gong, Yuan Li, Guojun Lan, Xiangyang Man, Jie Chen, Yingxiao Chen, Yunbao Jiang</i>	
Design and Implementation of Communication Nodes Based on STM32 and APL Ethernet Technology	79
<i>Bingjun Yan, Mingxu Gang, Bo Hu</i>	
Two-Stage Electricity Market Optimization Considering Wind Power Uncertainty and Coordinated Flexibility Resources	85
<i>Shanke Mou, Hao Chen, Nan Yang, Yingbei Yao, Zhendong Wan, Jingxuan Wang</i>	
Consider the mixed energy storage scheduling optimization strategy of compressed air and battery energy storage and its analysis	90
<i>Hao Chen, Shanke Mou, Nan Yang, Feike Li, Xuanwen Zhu</i>	

Distributionally Robust Optimization of Park-level Integrated Energy System Considering Demand Response and Uncertainties	96
<i>Xiaolin Zhang, Liang Song</i>	
Two-Stage Robust Co-Optimization of Capacity Planning and Day-Ahead Dispatch for a MultiMicrogrid System	103
<i>Ziyang Zhang, Hairong Zou</i>	
Multi-Objective Optimal Sizing of Wind-PV-ESS for Traction Power Supply Systems Based on MOEA/DSADE	109
<i>Fei Chen, Lele Fang, Lu Geng, Bohan Qiu</i>	
Hierarchical Coordinated Dynamic Reactive Power Optimization for Oilfield Power Grid Based on Multi-objective Whale Algorithm	113
<i>Chaohong Zhou, Fan Zhang, Shenhui Gu, Dong Li, Zexi Zhao</i>	
Reverse generation of substation logic model method from optical cable data	120
<i>Xiaoyan Hu, Xiaojing Zhang, Xiaomin Wang</i>	
Capacity Optimization of Hybrid Battery-Hydrogen Energy Storage Systems for Offshore Wind Power - A Case Study of Fujian Province	126
<i>Yi Du, Lu Zheng, Yuying Zheng, Zihan Jin, Qingchao Ji</i>	
Coordinated Control of Multi-Unit Methanol Range Extenders for Intelligent Drilling Systems: An Optimal Power Distribution Strategy Based on Dynamic Programming	131
<i>Meng Wang, Chun Cheng, Hao Liu, Xiaoli Hu, Shan Zhang, Yingchao Wang</i>	
Real-Time Dynamic Job Shop Scheduling Method Based on Digital Twin and Deep Reinforcement Learning (TD3)	135
<i>Chen Yang</i>	
Research on Multi-Scenario Scheduling Optimization Method for Virtual Power Plant Equipment Based on Association Rules	139
<i>Liang Cao, Xiaoyong Xu, Leting Yu, Zhenkai He</i>	
Construction of a Photovoltaic Power Plant Power Prediction Model Based on Meteorological Factor	143
<i>Xianlin Heng, Bingkuan Gong, Chongyu Cui, Kun Zang, Liupan Jing, Yuqing Wang</i>	
Research on Value Assessment and Optimal Dispatch of Flexible Regulation Resources in Park-level New Power Systems	151
<i>Huicai Wang, Hailang Zhou, Mingya Sheng, Fangfei Ye, Run Zhang</i>	
Determination of Attribute Weights for Path Planning Based on Dominance Relation Rough Set	156
<i>Yuhao Shan, Hongzhi Wang, Bing Wu</i>	
Distribution Network Topology Identification and Robust Grid Reinforcement Considering Topological Uncertainty	161
<i>Hengle Cao</i>	
A Lightweight Integrated Load Forecasting Framework with Uncertainty Quantification for Smart Grid Dispatch	168
<i>Heng Wang</i>	
Reliability and Deployment Technology of Power 5G Communication Network	172
<i>Yu Gu, Mengqing Zhao, Zhiyuan Yu, Tianyi Zhang, Xu Gong</i>	

Design and Optimization Methods of Key Parameters for Enhancing HVDC-Based Renewable Energy Transmission Capacity	176
<i>Changzun Wu, Yi Hao, Kai Wang</i>	
System Architecture and IoT Technologies for Intelligent Inspection Using Humanoid Robots	181
<i>Hong Tang, Shuang Li, Xuesong Lang, Fucun Huang, Ke Huang</i>	
Hydropower Capacity Expansion and Economic Analysis Using an Integrated Xinanjiang–Muskingum Model	185
<i>Yuhang Li, Yingjing He, Yangqing Dan, Qingyue Chen, Yongzhi Zhou</i>	
Game-Theoretic Day-Ahead Pricing Strategy for Renewable Energy Clusters Considering Multi-Timescale Forecast Deviations	190
<i>Ying Li, Weilin Zhong, Jialong Han, Junru Chen, Quan Li, Muiyang Liu</i>	
Research on optimal regulation strategy of virtual power plant for regional voltage regulation	197
<i>Kaicheng Liu, Haoran Yang, Xiang Hu, Jiayi Zhu</i>	
Intelligent Wellhead Pressure Remote Monitoring System Based on LoRa and RS-485 Communication	201
<i>Yongzhuo Xu, Kaiqi Zhang, Zhiyu Li, Lianghai Guo</i>	
A Method for Enhancing Knowledge Retrieval in Typical Power Scenarios Based on BFS Algorithm	206
<i>Bowen Shao, Yanli Yao, Zhiyuan Zhang, Sen Wang, Zixin Zhang</i>	
A Strategy for Multi-Park Energy Collaborative Optimization Based on Shared Energy Storage	210
<i>Yungang Wu, Su Su, Xiaona Wang, Minghao Zhang, Fei Yang, Xi Chen, Wei Deng, Xiongwei Feng</i>	
LSTM-Based Monthly Electricity Demand Forecasting Using Multi-Source Feature Selection	222
<i>Peiguang Chen, Boqiang Li, Xiaotong Han, Jizhe Dong</i>	
Research on Load Transfer of Distribution Networks Based on Improved Reinforcement Learning	226
<i>Zhunan Jiang, Chenxu Zhao, Peng Ye, Shixuan Lu</i>	
Multi-mode Control Strategy for Grid-connected PV-Storage Systems Considering Multi-factor cooperation	230
<i>Xiaogang Wu, Xinwei Hu, Xiang Cheng, Qingfeng Ji, Tong Xia, Yi Zhang</i>	
Non-Intrusive Daily Load Forecasting based on The Concept of Similar-Type Days	236
<i>Chang Ji, Hanbing Zhang, Tong Xia, Aoying Ji, Hui Huang, Xinlei Chen</i>	
Optimization Configuration of the PV-Hydrogen Coupling System Based on Second-Order Cone Programming	240
<i>Ning Zhang, Jiatian Gan, Jun Yang, Jingang Wang</i>	
Optimization of Dual-Time-Varying Control Systems for Generation Units under Source-Grid Uncertainty	246
<i>Hualong Zhang, Xi Wang, Yanbo Yang, Yiming Ma</i>	
Research on Key Technologies of Multi-Channel Data Relay Scheduling Based on FreeRTOS	250
<i>Wei Zhao, Haibo Bao, Zhen Huang, Yicheng Wang, Peng Wang</i>	
Application of Full-Duplex Wireless Communication Technology in Distributed Transformer Winding Deformation Testers	254
<i>Zhongwei Li, Jingyuan Chi, Xiao Ma, Ying Zhang, Yi Zhu</i>	

Research on Flow Accumulation Algorithm Based on TCAP	258
<i>Tianhao Yang</i>	
Machine-Learning-Based Capacity Forecasting and Dynamic Load Assessment for Distributed Energy Systems	262
<i>Shaoqing Duan</i>	
Dynamic Three-Dimensional Path Planning Based on Informed RRT* and Multi-Objective DWA Collaborative Optimization	267
<i>Baoyu Wang, Jiayi Feng, Zhiqing Li, Xiaodong Feng</i>	
Wind Power Forecasting Based on a GWO-TCN-LSTM Hybrid Model	273
<i>Chenlong Jiang, Tianyu Liu</i>	
Identification Method for Vulnerable Nodes in Power Distribution Systems Based on Operational Status and Network Centrality	277
<i>Yafeng Wang, Jingda Gu, Zihan Zhang, Xiaotong Li, Yiting Liu</i>	
Microgrid Load Forecasting and Optimization Scheduling: A Method Based on Deep Learning with Multi-Source Data Fusion	285
<i>Peng Deng</i>	
Design of a Dynamic Price Limit Mechanism for Power Markets Based on Extreme Value Theory	290
<i>Fangbo He, Qian Yang, Meichen Fan, Ruitao Yan, Feihu Hu, Anqi Zhu</i>	
Key Technologies and Applications of Integrated Multibeam, Side-Scan, and 3D Side-Scan Sonar Surveys for Offshore Wind Farms	294
<i>Xinhui Li, Jingen Miao, Guobing Zhang</i>	
Data-Driven Topology Identification and Parameter Estimation for Distribution Networks via Multi-Scale Feature Enhancement	298
<i>Guoxin Li, Sirui Cao, Tianyu Xu, Haozhe Ma, Jiarun Li</i>	
Association Mining between Electric Vehicle Charging Behavior and Electricity Price	302
<i>Na Li, Chao Ma, Jianwen Zhang, Mengyao Tian, Wenxuan Li</i>	
Reliability Assessment of Power Systems with Wind Uncertainty via Conditional Distributionally Robust Optimization	306
<i>Xiaoling Wu, Jueyou Li</i>	
GridCFN: A Causal Spatio-Temporal Framework for Power Flow Uncertainty Prediction	310
<i>Tianze Zhao, Min Zhao, Yuzhuo Dai, Gengchen Zhang</i>	
A Preliminary Study on Regional PV Output Prediction Based on Spatial Downscaling	315
<i>Chengdong Li, Bingkuan Gong, Chongyu Cui, Kun Zang, Xuezheng Quan, Shuye Liu</i>	
Smart Grid Scheduling Optimization Based on Deep Reinforcement Learning	323
<i>Ningfeng Huang</i>	
Effects of Flow Rate and Split Ratio on Separation Performance of Bezier-Curved-Cone Hydrocyclone Series System	327
<i>Yafei Zhang, Yinghao Yang</i>	

Automated Maintenance Work Order Generation via DoRA with Automated Hyperparameter Optimization	331
<i>Zhiyuan An, Yan Liu, Chunying Wang, Lijie Wu, Lei Wang</i>	
A Distributed Collaborative Optimization Strategy for Peer-to-Peer Trading and Shared Energy Storage	336
<i>Yuming Shen, Jiayin Xu, Liuzhu Zhu, Jiaqing Wang, Xuli Wang, Guifen Jiang</i>	
Research on Model Predictive Control Strategy for LNG Liquefaction Unit Considering Refrigeration Cycle Coupling	340
<i>Aixiang Tang, Renchu He</i>	
Intelligent Temperature Prediction of Shale Oil Stations Based on VMD-CNN-LSTM	345
<i>Honghong Li, Lihui Zheng, Xiangchun Wang, Peng Zhang, Binbin Qi, Xueqian Zuo, Shuaishuai Nie</i>	
Deep Learning based Spatiotemporal Analysis of Line Loss Rate with High Proportion Penetration of Renewable Energy in Power Grid	351
<i>Xiongjie Zhou, Haifeng Li, Di Sun, Xin Guan</i>	
Multi-Criteria Evaluation and Selection of Investment Schemes for Transmission and Transformation Projects Considering Life-cycle Cost and Carbon Emissions	356
<i>Wei Sun, Gang Yu, Chao Han, Yanbo Wang, Dan Xu, Yubo Fu</i>	
Optimization of Car Alarm Production Line Based on CWOA	365
<i>Yupeng Liu, Chunyu Liu, Weinan Zheng, Yuehui Wang, Ying Du, Jian Jin, Miao Yu, Junliang Sha</i>	
Unsupervised Learning with Counterfactual Explanations for Sucker Rod Pump Fault Diagnosis	371
<i>Yiming Chen</i>	
Method for Monitoring and Intelligent Fault Repair of Secure Operating Systems for Power Grid Informatization Terminals	378
<i>Tong Li, Shuai Ren, Dongyu Li, Jian Chen, Zhanguo Wang, Weiwei Zou</i>	
A Substation Digital Pressure Plate State Recognition Algorithm Based on Convolutional Neural Networks and AI Large Models	382
<i>Naichao Song</i>	
Research on A High-Sensitivity Near-Real-Time Accurate Health Monitoring Method for Satellite Flywheels in Orbit Based on the “Speed-Current” Model	386
<i>Chaoqun Li, Lin Li, Shiyu Xia, Zhenqiang Hong</i>	
The Influence of Surface Structure on the Heat Dissipation Performance of Aluminium Surface	394
<i>Bo Li, Jie Bai, Tao Jiang, Xujiang Hua, Tao Zhu, Yuan Yuan</i>	
PSO-LSTM Based SOH Estimation Method for Li-ion Batteries	399
<i>Jinqiao Du, Jie Tian, Bo Rao, Zhaojie Liang, Tengting Li, Xiner Luo, Jiuchun Jiang</i>	
A convolutional regression-based approach for short-circuit fault diagnosis in turbine generator excitation windings	406
<i>Yingjiang Ding, Tong Jiang, Mulin Liu, Yongjin Xu, Jing Gui</i>	
Research on Finite Element Mapping Modeling of Key Transformer Components Integrating Deep Learning	412
<i>Jie Tang, Rundong Gan, Haozhou Wang</i>	

Investigation on the Discharge Characteristics and Identification of Inter-turn Faults in Oil-paper Insulation	417
<i>Yuanzhe Zhang, Meng Huang, Guangrui Shi, Yuan Luo, Kehan Zhu, Bo Qi</i>	
Research on self-cleaning insulation material at the end of stator bar	421
<i>Jiang Zhou, Chunqin Ni, Huixin Huang, Guoyong Liu, Yue Zhang, Yuan Yuan</i>	
An Auxiliary Inference Method for Electronic Component Failure Causes Based on Neighborhood Aggregation and a OvR-Logistic Regression Framework	425
<i>Huixin Liu, Chuanwen Wu, Xiaoli Bao, Zeyu Sun, Yajing Guo, Yang Wang</i>	
Precise Fault Location Within a Feeder Section Based on Modulus Transformation and Wavelet Analysis	430
<i>Chen Yang, Ke Wang, Wei Li, Honglin Wang, Xu Hua, Yadong Liu</i>	
Construction of Spark-based Power Equipment Fault Prediction System and Lifecycle Cost-Benefit Analysis	434
<i>Xuan He, Qiang Zeng, Zhen Xiang, Liang Zhang, Zihui Zhao, Lihong Qian</i>	
Incipient Fault Detection Method for Distribution Network Insulators based on Time-Frequency and Waveform Characteristics	438
<i>Ruirui Xie, Mingming Xu, Zhaoru Han, Yuehui Hu, Xiaobin Wang</i>	
Research on Frequency Response Testing Technology of Three phase Transformer Based on Constant Current Excitation and Automatic Phase Change	443
<i>Jie Zhu, Zhen Meng, Peng Qiu, Yifeng Fu, Zehaohan Zhao</i>	
Partial Discharge Pattern Recognition of Switch Cabinets Based on the Fusion of Ultrasonic and Gas Data	447
<i>Long Zhao, Haiwei Wang, Haisheng Gu, Dongbo Song, Zuosheng Zhang, Xin Tong, Teng Tian Yunlong Huang</i>	
Research on Incipient Fault Section Location in Distribution Networks based on Pearson Correlation and Probabilistic Mapping	451
<i>Mingming Xu, Ruirui Xie, Xuan Dong, Zhaoru Han, Yuehui Hu, Xiaobin Wang</i>	
Health-Index-Based Operation and Maintenance Strategy for Vacuum On-Load Tap Changers in High Voltage Power Transformers	456
<i>Xing Wang, Xing Wang, Yi Zhu, Yutong Wang, Tianyue Li</i>	
High-Impedance Fault Detection in Distribution Networks Based on Multi-Dimensional Feature Fusion of Zero-Sequence Current	461
<i>Zebo Jiang, Dong Liang, Xingchi Cui, Rui Li</i>	
Joint Application of Wind Load LiDAR and X-ray Nondestructive Testing in Overhead Line Conductor Maintenance	465
<i>Hongjie Zhang, Chuanfei Jiang, Huibin Liu, Xin Shang, Peng Chen, Jianming Hao</i>	
Construction and Experimental Verification of a Wideband Distributed Electromagnetic Dual Circuit Model of Transformers	472
<i>Yubao Su, Gang Li, Ke Wang, Ruijuan Tan, Xiaolin Zhao, Jianyi Wang</i>	
Research on On-line Perception Method and Device of Transformer On-load Tap Changer Based on Electromagnetic Transient Multidimensional Information Fusion	476
<i>Yuancheng Zhu, Qi Zhang, Xiaoyu Li, Guowei Li, Lijun Yin</i>	

Research on Underground Pipeline Diameter Identification Coupling Ground-Penetrating Radar and Hough Transform	480
<i>Xiaolang Kong, Binbin Zhao, Yi Liu, Tong Zhuang</i>	
Transformer Hotspot Temperature Prediction Based on Improved Dynamic Thermal Circuit Model	487
<i>Qinzheng Wu, Tianguang Lu, Zhenwei Zhang, Shaocong Wu</i>	
Multivariate Characterization of the Thermal Aging State of 10 kV XLPE Cable Insulation	491
<i>Ran Hu, Yanzhi Wu, Zihang Zhang, Fan Yang, Hongliang Chang, Shusheng Song</i>	
Research on the Design of Object Measurement Device Based on Monocular Vision	496
<i>Yan Yu, Peixiong Wu</i>	
Joint Model of Synchronous Machines and Transformers Based on Mate Equivalents	502
<i>Jiajun Luo, Yinsheng Su, Ziwei Zhao, Qian Ma, Yifu Liao, Haicheng Yao, Shujun Yao</i>	
Research on Intelligent Defect Detection and Classification Method for Transmission Lines Based	508
<i>Shuai Guo, Xiangyu Zhao, Ruiye Zhou, Shang Cao, Huanming Zhang</i>	
Effect of antioxidant types on thermal aging properties of insulating paper in transformer oil-paper insulation	514
<i>Wu Nie, Bo Zhang, Yan Du, Wei Luo, Yang Wang</i>	
Study on the Curing Kinetics and Multiphysics Simulation of New Highly Degradable Epoxy Resin for Dry-type Transformer	519
<i>Jiaxin Liu, Li Zhang, Yiwei Wang, Junpeng Ji</i>	
Research on High-Voltage Insulation Dielectric Loss Measurement Method Driven by Multi-Source Data	523
<i>Shibo Zhao</i>	
Influence of Test Cables on Transformer Frequency Response Analysis and Development of a Winding Deformation Tester Based on Radio-Frequency Communication Technology	529
<i>Kai Gao, Zhen Meng, Jialin Li, Dalve Cai, Yishen Guo</i>	
Analysis of EM void growth failure time in multiple via structure	533
<i>Xiaojing Fan, Ge Gao</i>	
Comprehensive Assessment of Insulator Operating Condition Based on Matter-Element and Cloud Model Integration	538
<i>Haonan Che, Jin Xu</i>	
Hybrid Adaptive Wavelet Thresholding for Partial Discharge Signal Denoising	544
<i>Zisheng Zou</i>	
Count-Rate-Modulated NV-Diamond Quantum Magnetometry with Phase-Noise Suppression and Sensitivity Breakthrough	548
<i>Ximing Gao, Wei Luo, Jiguang Zhao, Bing Tian, Liang Zhao, Bo Yang</i>	
An AI-Driven Multimodal Feature Fusion Framework for Integrated Circuit Fault Diagnosis	553
<i>Hongyi Xie</i>	
Application of Waveform Data Preprocessing Method in Transformer Fault	558
<i>Jian Wang, Xiao Sun, Dingqian Yang, Ziliang Zheng, Haoran Zhou</i>	

Research on Current Fault Detection Methods in Low-Voltage Networks Based on Isolated Forest and Bayesian Optimization Algorithms	562
<i>Kaiyu Yu</i>	
Numerical Study on Seismic Responses of HV Power Transformer	566
<i>Xiaojie Yang, Yongfu Ma, Zibin Li, Wang Zhu, Jiyun Ren, Xiaohan Liang</i>	
Research on On-line Monitoring Method for Damping Circuit Parameters of Thyristor Level in Converter Valves	570
<i>Jin Liu, Lin Zheng, Qiang Zhao, Tao Zhao, Bingqi Gu</i>	
Frequency-Dependent Parameter-Incorporated Equivalent Circuit Modeling and Fault Simulation for Transformer Windings Based on Frequency Response Analysis	575
<i>Xiaoxiao Luo, Haishan Zheng, Xiong Liu, Siqian Li</i>	
Study on Alternating Current Field Measurement Technique to Detect Cracks in Fusion Zone of T91/TP347H Dissimilar Steel Joint	582
<i>Yuntao Li, Benli Wan, Shuangsheng Yan, Chao Shi</i>	
Few-Shot Fault Diagnosis of Electric Submersible Pump Based on Transformer-Embedded Discriminative Prototypical Network	588
<i>Liangcheng Wang, Kang Li, Xiaoyong Gao, Chaodong Tan, Laibin Zhang</i>	
Transformer-Driven Fire Point Recognition for Power Transmission Corridor Monitoring	594
<i>Bo Gao, Shoubin Yuan, Wei Wang, Xiaohua Zhang, Shengchen Xu, Huanan Liu</i>	
Design of a 220 kV Flexible and Widely Compatible Standby Transformer	599
<i>Liangyuan Chen, Jian Zhao</i>	
Prediction Method of SF ₆ Decomposition Products Based on Bayesian Neural Network and Multi-dimensional Collaborative Compensation	603
<i>Xinmiao Xu, Junqing Yang, Qiqi Guo, Kun Wang</i>	
Cable Charging Status Detection: A Deep Learning Method Based on Magnetic Field Intensity Time-Series Signals	607
<i>Xiong Cai, Shuzhi Dai, Wulin Miao, Qijiang Pei, Haiqi Li, Liqun Su</i>	
Cable Charged State Detection: A Method Based on Magnetic Field Using LSTM Networks	615
<i>Xiong Cai, Wulin Miao, Shuzhi Dai, Jiong Hu, Lifeng Huang</i>	
Integration of Normalizing Flows and Prototypical Networks for Few-Shot Early Fault Detection in Transformer	621
<i>Yuanfa Cen, Honglian Qiu, Xuanzhen Chen, Lijun Mo, Ming Gao, Xinqi Lu, Baichi Ou, Xiaorou Huo</i>	
Design of Intelligent Generation System for Power Grid Fault Reports Based on Multi-source Heterogeneous Data Fusion	627
<i>Meizi Hou, Baichi Ou, Xuanzhen Chen, Xianzheng Chen, Lijun Mo, Jiaxuan Tang, Ming Gao, Ziyi Li</i>	
<i>Yuanfa Cen</i>	
Microwave Polarization-Controlled NV Center Superheterodyne Magnetic Detection System	632
<i>Chun Li, Dong Feng, Maoheng Jing, Xiaoxia Li, Wenhao Lu, Yihui Luo</i>	
Switching Control of double-heater heating systems based on Predictive Model	637
<i>Shuai Chen, Feiyang Zheng, Lin Sun</i>	

Simulation Study of IGBT Electric Field Optimization Based on Finite Element	644
<i>Wensheng Chen, Yiming Zhang, Shuo Yang</i>	
Adaptive Bipartite Formation Control for Nonlinear Multi-Unmanned Ground Vehicle Systems Under Sensor Attacks	648
<i>Lu Yin, Jie Lan, Zhiyao Ma</i>	
Modeling for Alkaline Water Electrolyzers based on Dual Bridge Series Resonant Converter	652
<i>Yong Sun, Baojv Li, Chenhang Shen, Yanghong Xia, Wei Wei, Guoyue Zhang, Hangfei Dong</i>	
Adaptive fuzzy active fault-tolerant control for fractional-order nonlinear systems with output constraint	657
<i>Ziyun Zhao, Zhiyao Ma, Jie Lan</i>	
A Hybrid Time-Event Driven ESO Based on a Low-Precision Position Sensor for ADRC of Electric Machine Drives	661
<i>Zihan Zhang, Qiwu Wang, Jianbo Gao, Yu Li, Wei Wang, Guofeng Dong</i>	
Research Progress on the Innovation of Power Electronic Topologies for Electric Vehicle Motor Drives	667
<i>Xibei Shi</i>	
Research on Model Predictive Control for Hybrid Ships Based on Operational Condition Recognition	673
<i>Wenhui Lai, Jiang You</i>	
Design of a 32-Channel Exhalation Acquisition Circuit Based on Multi-Level Multiplexing	679
<i>Kun Li, Guangpeng Zhang, Juan Qin, Changsong Wang, Yu Wang</i>	
Robust Optimization of an Electric Vehicle Powertrain Mounting System Based on an Adaptive Subinterval Method	683
<i>Jie Wu</i>	
An Approach Based on SOGI Observer to Improve the Dynamic Performance of Repetitive Control in Permanent Magnet Synchronous Motors	688
<i>Yuanming Zhang, Lingjun Lu, Jian Yang, Mi Dong, Jun Leng, Qilong Liang</i>	
Space-Vector Analysis of Open-end Winding Motor Drive with Isolated Supply Under Switch ShortCircuit Fault	693
<i>Xiangwen Sun, Jiajun Wang, Min Qian</i>	
Design of a Millimeter-Wave Power Amplifier Based on GaAs Technology	697
<i>Ao Feng, Jiahao Zhao, Guhaolan Zhao, Kang Yang, Wei Hu, Di Jiang, Jianglai Tian, Ye Yuan</i>	
A Resonant-Switching Capacitor for Impedance Matching in RF Plasma Systems	702
<i>Jiahao Qi, Haiping Ren</i>	
Neural Lyapunov Control based on Importance Sampling	706
<i>Fangzhou Yu, Zhengyun Ren</i>	
Design and Robustness Analysis of a NOR Logic Gate Based on Complementary Negative-Capacitance Field-Effect Transistors	710
<i>Yuchen Qiu, Lin Kang</i>	
Improved Balun Chip Design Based on GaAs IPD Technology	714
<i>Junzhen Ruan, Yonggang Zhou</i>	

Torque Ripple Suppression Strategy for Brushless DC Motors Across the Entire Speed Range	718
<i>Yang Li, Xiaodong Kang</i>	
A High-gain Low-noise Op-Amp Based on RIRFC Structure	722
<i>Meixing Zhao, Wanrong Zhang, Chao Li, Hao Chen, Jingxuan Wang, Jingxue Yu</i>	
Research on Trajectory Planning and Motion of a Hybrid-Structure Flexible Manipulator Using an Improved PSO Algorithm	727
<i>Jialin Sun, Haidong Hu, Zifeng Shen, Yu Jiang</i>	
Design and Communication Optimization of an LLC Resonator- Based Wireless Charging System	734
<i>Huangyue Chen</i>	
Research on Sequential Model Predictive Control of Permanent Magnet Synchronous Motors Based on RCS-PMSM	738
<i>Jinyu Wang, Yangyang Pan, Hui Kong</i>	
Research on Speed Monitoring and Control Methods in Industrial Conveyor Systems Subtitle	743
<i>Yiheng Huang</i>	
Optimization Study on the Theoretical Model of Thermoelectric Micro-Electro-Mechanical Systems (MEMS) Microwave Power Sensors	748
<i>Fangruoyan Chen</i>	
Incremental Predictive Current Control Based on Dual-Stage Extended State Observer	752
<i>Mingdi Wang, Haiyan Zhang</i>	
Peak Characteristics of a Hairpin Winding Permanent Magnet Synchronous Motor with Dual-strand Pins	756
<i>Mengyuan Zhang, Lijun Zhang, Yu Gong, Han Guo</i>	
Design and Implementation of Reconfigurable Frequency Synthesizer Receiver for Spaceborne Phased Array Radar	762
<i>Qiuming Zhang, Zhangweiyi Liu, Shuo Dong, Hanqing Wang, Sheng Zhai</i>	
Performance Simulation and Parameter Optimization of Permanent Magnet Disc Motors for Oil Pumping Units	767
<i>Yawei Duan, Chaodong Tan, Chaoluan Tan, Jian Song</i>	
Design and Performance of Grid Emulators for Renewable Grid-Integration: Topology and InverterSide Control	774
<i>Kesheng Wang</i>	
Research on LLC Resonant Converters with CLC Filters for Low Inrush Current	780
<i>Lei Lei, Jinfeng Xiao, Xin Ouyang, Cheng Li</i>	
A High-Gain Coupled-Inductor Dual-Switch Quadratic Boost Converter	784
<i>Ke Ding</i>	
A Reinforcement-Learning Logic Synthesis Framework and Its Integration into the EDA Flow	788
<i>Yicheng Duan</i>	
Design and Implementation of a Large-Scale Series Battery Pack Voltage Acquisition Circuit Based on Programmable Switch Arrays	794
<i>Kun Li, Yang Xue, Haiping Ren, Daoyi Zhu</i>	

Simulation and Analysis of a Boiler Main Steam Temperature Control System Based on Improved Smith- Fractional-Order PID	798
<i>Jiaxin Yang, Zhengang Wan</i>	
High-Stability Clock Recovery Circuit Based on Adaptive Bandwidth Phase-Locked Loop (PLL)	802
<i>Yunfeng Zhao</i>	
Power Allocation Control Strategy of Single-Phase Parallel Inverters Based on Virtual Impedance	806
<i>Xiaokuan Zhao, Zaiyong Jiang, Haifeng Wang</i>	
Research on Model Predictive Current Control Strategies for Dual Three-Phase Permanent Magnet Synchronous Motors	811
<i>Ze Li, Xiaodong Yao</i>	
Application of FPGA-Based Embedded Real-Time Control System in the Dynamic Stability Optimization of Photovoltaic Inverters	815
<i>Zijun Song, Chenrui Zhang, Yichen Yuan, Zheng Cao, Yihao Zhang, Zhihang Sun</i>	
Alignment Correction and Systematic Bias Feedforward for Large-Format Bipolar-Plate Stacking	819
<i>Shaoyu Lin, Christopher Ehrmann, Liyan Zhao, Quang Trung Le, Lishun Zhou, Hongjie Ma, Weimin Zhang</i>	
A Comparative Analysis of State Estimators for Sensorless Control of DC Motors	824
<i>Shengkun Ji, Mi Lv</i>	
Research on Electric Inertia Compensation and Braking Performance Mathematical Modeling in Flight Tests	828
<i>Jiabin Guo</i>	
An Integrated Control Strategy for High-Frequency and Low-Frequency Circulating Current Suppression in Parallel Converters	832
<i>Chuanyue Shen, Jianbo Gao, Qiwu Wang, Wei Wang, Qingzhao Li, Guofeng Dong, Guoxing Zhang, Yu Li</i>	
Research on Fast Impedance Matching Networks for RF Plasma Based on Back-to-Back SiC MOSFETs	839
<i>Shuo Zhang, Haiping Ren</i>	
Model Predictive Control with Multi-Objective Cost Function for Current Sharing in IPOP-DAB Converters	843
<i>Shuo Xu, Zhong Xu, Chang Liu, Di Wu</i>	
Asynchronous FIFO Design Based on Clock Gating Power Optimization	849
<i>Haocheng Guo, Yao Zhang</i>	
Design of a Monitoring System and Operating Parameter Optimization for a Controllable Commutated Converter	855
<i>Meng Sun, Fei Jiang, Jianliang Lu, Chao Leng, Chenghao Wang, Xiaolong Zhang</i>	
Research on Impedance Control Algorithm for Heavy-Duty Electro-Hydraulic Hybrid Driven Legged System	861
<i>Jiacheng Yang, Yongheng Hu, Hujiang Wang, Minggang Du, Xingyu Wang, Ao Shen</i>	
Research on Model Predictive Control Method for Open-End Winding Permanent Magnet Synchronous Motor Based on Dynamic Sector Selection and Weight Adjustment	871
<i>Yinghao Xu, Qiaoliang Huang, Haifeng Wei, Jia Cui</i>	

Online Inductance Correction Strategy by High Frequency Injection and Interference Minimization for Slide Mode Observer based Sensorless SPMSM Drive	877
<i>Yifan Wu, Liqing Liao, Jian Yang, Yaying Wang, Yanfu Ge, Jun Leng</i>	
Research on Autonomous Navigation of Catamaran-Type Unmanned Bait-Deployment Vessels	882
<i>Jifu Xue, Chenglong Yang, Qingfeng Cao, Ye Ye</i>	
AI Algorithm-Based Synchrophasor Measurement Technology for Power Systems	886
<i>Jingyuan Xiang, Shaodong Chen, Lihong Yin, Yaqiang Lu, Yuhui Song</i>	
Power Quality Enhancement Strategy Using Dynamic Adaptive SVPWM Control and SVG Reactive Power Compensation	891
<i>Xiwei Fu, Yubin Fu, Jun Li, Zewei Zhan, Sijia Hu, Xiaoqiang Wang</i>	
Research on AC Ice-melting Reactive Power Compensation Control Method Considering the Impedance Variation of Overhead Ground Wire	900
<i>Haoyi Liu, Shuangyan Shu, Zheng Wang, Lu Cai, Changfa Liu</i>	
Evolution Mechanism Analysis of Continuous HVRT/LVRT Chain Off-Grid Caused by Wideband Oscillation	905
<i>Honglu Xu, Ni Zhen, Liping Gao, Zixuan Guo</i>	
A Sub-synchronous Oscillation Suppression Method for Grid-forming Converters Based on Composite Power	911
<i>Chang Chen, Lingxiao Ye, Kaijian Du, Fangge Shao</i>	
VSG-Integrated Frequency and Voltage Regulation Strategy for Diesel-Storage Hybrid Microgrids	917
<i>Yanpeng Sun, Zhijun Wang</i>	
Research on Sensitivity Analysis Methods for DC Bias Risk in Large-Scale Power Grids	923
<i>Yingying Zhang, Xiaotong Gou, Zhuohong Pan, Lin Geng, Bichuan Xu, Xin Liu</i>	
Research on a Model-Driven Approach for Integrated Analysis of Power System Frequency Response Based on Initial Predictions	928
<i>Ou Zhang, Xiaoyu Zhou, Xingcheng Yu, Xuefeng Wu, Xue Jiang</i>	
A Comprehensive Assessment Method for Power Quality Based on Combined Weighting Using AHP Entropy Weighting Approach	932
<i>Yongsheng Ju, Yanjun Feng, Zhifeng Wang, Xin Zhang, Anlong Hu</i>	
A Deep Learning-Based Error Correction Model for Power System Frequency Response Prediction	939
<i>Xiaoyu Zhou, Qiangsheng Xu, Xuefeng Wu, Jiannan Li, Junru Lin</i>	
Enhancing Power System Resilience in Extreme Scenarios: Integrated Strategies and Collaborative Governance Mechanisms	943
<i>Xubin Wang, Jun Zhang</i>	
Control Strategy for Inertia-Flywheel Energy Storage System Participating in Grid Frequency Regulation	948
<i>Kunyu Sun, Xiangkai Wei, Tonghui Li, Hongfen Tang, Hongfei Zhu, Xinjian Jiang</i>	
Research on Power Measurement Algorithm for Voltage Sag Based on Db4 Wavelet Packet Transform	955
<i>Yu Su, Yingying Cheng, Tao Cheng, Wenli Chen, Min He, Feili Yang, Wenbo Yao</i>	

Safety Analysis of Double Grounding Mode for Maintenance of Active Distribution Networks	960
<i>Jun Chen, Xuanqing Zhou, Jian Sun, Qinghua Chen</i>	
A Comparative Study of the Effect of Rainfall on Ground Resistance at Different Depths	964
<i>Yi Chang, Peng Gao, Bo Sun, Mu Liu, Haoquan Wang</i>	
FPGA-Based Harmonic Mitigation for Residential EV Charging Piles in Low-Voltage Distribution Networks	968
<i>Chao Zhang, Yongjie Tong, Yuetian Wang, Hong Zhang, Xu Tan</i>	
Research on Design and Control Methods of High-Efficiency De-icing Device for Substation Equipment	972
<i>Guangpu Wang, Fei Xiong, Dong Liang, Yuxin Zhang, Xinran Wang, Ligang Quan</i>	
Investigation into the Formation Mechanism and Simulation of Transformer Inrush Current in the Context of Offshore Wind Farms	976
<i>Xinlei Zhang, Gang Li, Ke Wang, Jiaxi Li, Jiantao Sun, Geqi Li</i>	
A Relay Protection Method for New Energy Grid Integration Based on Multi-Source Information Fusion with Dynamically Adjusted Weights	981
<i>Guohua Wu, Xu Fang, Yirong Ma, Haohui Zhu, Jun Wang, Luohao Lin, Yiqiao Chen, Wenjing Fang</i>	
Numerical Simulation Study on Hot Air De-icing of High-Voltage Electrical Equipment in Substations	986
<i>Ying Guo, Qingda Liu, Xiaozhuo Guan, Rao Fu, Xu Liu, Tiebin Guo</i>	
Numerical Simulation of Onset Conditions for Corona Discharges on Stranded Conductors	990
<i>Zhibin Guo, Kai Yu, Qianyun Song, Feng Dai, Changyi Kang, Jingyi Xu, Lingfeng Zhu, Yuzheng Liu, Jiahui He</i>	
Modular simulation implementation of radar sidelobe cancellation system	995
<i>Kun Zhang, Min Duan, Bin Deng, Yichi Zhang, Shilin Deng</i>	
Application research of blind source separation algorithm in radar anti main lobe interference	999
<i>Min Duan, Kun Zhang, Bin Deng, Shilin Deng, Yichi Zhang</i>	
A Prediction Model for Icing Thickness of Transmission and Substation Lines Based on WOA-BiLSTM	1003
<i>Lidan Zhang, Yuxin Zhang, Guangpu Wang, Xu Liu, Tianyu Zhang, Songnan Pang</i>	
Multi-objective Optimization of Core Parameters for Electric Detachable Grounding Device Based on NSGA-III	1007
<i>Tianyu Zhang, Bo Zhang, Da Li, Zheng Liu, Dianwen Li, Guangpu Wang</i>	
Charge Effect on Impulse Testing of Air-insulated Gap	1011
<i>Bin Tang, Jingjie Zeng, Kai Yu, Junkai Li, Hao Yu, Jianxun Zhang, Xin Lin, Yuxin Li</i>	
Research on digital systematic development of key elements of electromagnetic compatibility in high voltage system	1016
<i>Jiandong Guo, Hongchao Wang, Xiaomin Zhang, Yang Chen</i>	
Stability Analysis and Oscillation Mechanism of Offshore Wind-PV-Storage Integrated via MMC-HVDC System	1020
<i>Yuxi Sun, Yuyue Zhang, Li Ma, Shichao Xu, Zhen Li</i>	

Impedance Modeling of MMC-HVDC System with Offshore Wind-Solar-Storage Integration	1025
<i>Changcheng Song, Xin Tian, Yu Chen, Zhen Li</i>	
Grid-Forming Energy Storage in Low-SCR Grids: Modeling and Simulation	1031
<i>Yaohui Geng, Junru Chen, Baoyu Zhai, Chenchen Ge, Yushan Liu, Shuchao Liang</i>	
Optimization Method for Wind Power Frequency Regulation Parameters Based on Coordinated Frequency Response Control	1036
<i>Xiaohui Zhao, Laifu Ming, Tenglong Lu</i>	
Experimental and Simulation Study on Short-Circuit Current Characteristics of Photovoltaic Systems Connected to Distribution Networks	1043
<i>Peng Ye, Qiyuan Chen, Shixuan Lu</i>	
Research on Voltage Support of the Hybrid Grid Energy Storage System Based on Lithium Battery and Supercapacitor	1047
<i>Xinghan Chen, Peng Ye, Shixuan Lu</i>	
Transient overvoltage suppression method under commutation failure scenario for wind power sending system via HVDC transmission	1051
<i>Shuyi Wang, Zhijun Wang</i>	
10 kV Lines Near-Electricity Warning Technology Based on Electric Field Measurement	1057
<i>Yuqing Lei, Jianglin Zhou, Siyu Xiong, Zhenong Zhang, Kun Ke</i>	
Electrical Safety Monitoring and Protection Technologies for Substation Warehouse Operation Equipment	1061
<i>Zhen Xu, Angze Li, Dianlong Sun, Hongfeng Sun</i>	
Microgrid Power Quality Enhancement: A Hybrid CNN-SVM Based Fault Detection System	1065
<i>Kai Qin, Wenyi Wu</i>	
A Strategy for Isolation Zone Partitioning in Distribution Networks Considering Graph-Based Physical Information Coupling	1070
<i>Guangru Zhang, Haodong Ren, Jie Chen, Jiawu Zhang, Dilong Fan, Binyu Liu</i>	
Mitigating Electrical Fire Hazards in Forested Areas: A Transient-Based Relay Protection Scheme	1078
<i>Xiangyin Guo, Dong Liang, Xingchi Cui, Rui Li</i>	
Knowledge-Embedded Deep Reinforcement Learning-Based Emergency Frequency Control Method for Power Systems	1082
<i>Xiaoyu Zhou, Jiannan Li, Qiangsheng Xu, Junru Lin, Chao Ge</i>	
Analysis of the Impact of Reactive Power Compensation Equipment on the Impedance Characteristics and Wide-Band Oscillation Stability of New Energy Power Plants	1086
<i>Lei Zhou, Xutao Li, Ningbo Zhang, Wenbo Gu</i>	
Simulation Analysis of Circulating Current in Parallel-Operating Transformers	1094
<i>Liangyuan Chen, Jian Zhao</i>	
Transient Analysis of Long-Distance Subsea Power Supply and Distribution Systems Based on Distributed Parameter Modeling	1099
<i>Dayong Wang, Haizhu Wang, Niantao Zhang, Yinzhi Ma, Lvyin Niu, Wei Yang</i>	

YOLOv10-PowerBird: Real-Time Bird Detection for Power Transmission Safety Using UAV and Lightweight Deep Learning	1105
<i>Tuo Shen, Keqiang Wang, Deyuan Li, Mengnan Wang, Zhenyu Jiang, Guangmin Gao</i>	
Intelligent Recognition Method and System for Power Grid Flood based on Ground Monitoring Video	1110
<i>Shunchao Dong, Guoliang Yue, Sihang Zhang, Ruidong He, Jiangbo Tian, Jingpu Ge</i>	
Research on Cascading Failure Control and Resilience in Power Grid Based on Key Node	1115
<i>Gengchen Zhang, Min Zhao</i>	
Fault Arc Detection: A Deep Learning-Based Multi-Level Energy Integration Model	1122
<i>Runan Song, Penghe Zhang, Yang Xue, Yining Yang, Chen Guo</i>	
Analysis of Multi-Level Smooth Grid-Connection Characteristics and Collaborative Optimization Control for Grid-Forming Energy Storage Systems	1127
<i>Qiang Fu, Jian Liang, Xiaoyun Zhang</i>	
Dynamic Characteristics of an Islanded DC Microgrid Incorporating Energy Storage-Based Virtual Inertia Control	1136
<i>Yao Cheng</i>	