

2025 4th International Conference on Power Systems and Electrical Technology (PSET 2025)

**Tokyo, Japan
4-8 August 2025**

Pages 1-525



**IEEE Catalog Number: CFP25CM6-POD
ISBN: 979-8-3315-3729-6**

**Copyright © 2025 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:	CFP25CM6-POD
ISBN (Print-On-Demand):	979-8-3315-3729-6
ISBN (Online):	979-8-3315-3728-9

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

2025 4th International Conference on Power Systems and Electrical Technology (PSET)

Table of Contents

Preface	xvi
Conference Committee	xvii

Control and Protection of AC/DC Hybrid Transmission System

Method for Optimized Arrangement of Vertical Grounding Electrode Parameters in Transmission Towers and Simulation Validation	1
<i>Zihan Lei, Wenkai Gong, Ruiqing Xu</i>	
Optimal Transmission Model Development for Japanese Electricity System under Carbon Neutrality Scenario	7
<i>Qizhou YANG, Shigeru BANDO, Bo JIE, Jumpei BABA</i>	
A Rapid Calculation Method for Power Transmission Capability of a Typical Renewable Energy Station	13
<i>Bo Hu, Wu Cao, Liqun Sun, Shibo Wang</i>	
Study on Spatial Resolution Optimization in Transmission Line Fault Localization Based on Support Vector Machine	19
<i>Shu-hong Li, Shou-jun Bao, Sheng-hai Han, Yong Wei</i>	
Estimation of Switching Overvoltages during Energization of Transmission Lines using Recurrent Neural Networks	26
<i>Sandes Pelendagamage, Hasini De Silva</i>	
Generating Critical Scenarios of Transmission Interfaces Based on Denoising Diffusion Model	32
<i>Quan Zhang, Jiajie Ling, Wei Du, Jun Wang, Guangchao Geng, Quanyuan Jiang</i>	
Modeling and simulation analysis of X-ray backscattering for monitoring insulation defects in XLPE cable	37
<i>Ruohan Wu, Zhengzheng Liu, Yuxin Lu, Huanyu Shi</i>	
Intelligent Solutions for Real time Remote Overhead Power Line Monitoring in Conditions of Electronic Jamming Warfare on the Romanian Territory	42
<i>Constantin Moldoveanu, Catalin Lisman, Virgil Brezoianu, Ionel Fratila, Oana Leu, Vlad Schiopu, Irene Ionita</i>	

Electrical Equipment Control Model and Voltage Monitoring

Performance Enhancement of Voltage Source Inverters with Hybrid Carrier-based Space Vector Modulation Strategy	48
<i>Yu Than, Fuat Kucuk</i>	

A Decoupled Control Strategy for Line Voltage and Power Factor Based on the Steady-State Impedance Regulation Principle of RPFPC.....	54
<i>Chen Shao, Baixue Liang, Weilin Wu, Jiaoxin Jia</i>	
Stability and Passivity Analysis of Single-Voltage-Loop Grid-Forming VSIs with Negative Proportional Gain	63
<i>Yun Yu, Jingxuan Wu, Yajuan Guan, Solomon Feleke, Degarege Anteneh, Solomon Mamo, Juan C. Vasquez, Josep M. Guerrero</i>	
Construction of Parameter Stability Region for Repeated LVRT Problem Based on Fast Kernel Learning	68
<i>Tianguang Lu, Haokun Liu, Guanzhong Wang, Shaocong Wu, Yu Guo</i>	
Electric Field-Based Non-Contact Voltage Inversion Method for Overhead Lines via Regularized Neural Network Regression	75
<i>Xiang-yu Chen, Jian Fang, Haidong Xu, Yue Zhang, Xingming Ma, Shaoyin He</i>	
Attention-Enhanced Multi-Agent Safe Reinforcement Learning for Distributed Volt-VAR Control.....	80
<i>Yanlun Li, Xiaobo Dou, Xiangjun Quan, Kexin Zhang, Xiaotong Zhang</i>	
Modeling and Simulation of a Cycloconverter with a Bond Graph Approach	86
<i>Gerardo Ayala-Jaimes, Gilberto Gonzalez-Avalos, Allen A. Castillo, Alejandra Jimenez Vega</i>	
Frequency Control Method of Induction Heating Circuit with Consideration the Effect of Temperature on Ferromagnetic Loads	91
<i>Ting-Yang Sie, Fu-Sheng Pai, Yu-Ru Wang</i>	
Transient Stability Assessment of Grid-Forming Converters: Global Stability Region	96
<i>Zhifeng He, Zhenglong Sun, Naiyuan Liu</i>	
Design and Development of Intelligent Transformer	
Dual-Mode Grid Forming-Following Control Strategy for Multilevel Current Source Converters.....	102
<i>Marzio Barresi, Luigi Piegari, Riccardo Scalabrin</i>	
Design of a Novel Robust Adaptive PI controller for Dual Active Bridge Converter Enhanced by Transfer Learning Algorithm And Snake Optimization	108
<i>Seyyed Morteza Ghamari, Mehrdad Ghahramani, Daryoush Habibi, Asma Aziz</i>	
Nonlinear Robust Control of a MIMO Converter for Modular DC Nanogrids Based on Adaptive Disturbance Compensation	114
<i>Giovanni Garraffa, Antonino Sferlazza, Massimiliano Luna, Filippo D'Ippolito, Angelo Accetta, Francesco Alonge, Marcello Pucci</i>	
Discharge Detection and Impact Analysis in Power Electronic Systems	
Partial Discharge Characteristics under DAC Voltages with Different Frequencies and Charging Polarities.....	120
<i>Jia Peng, Zhaole Dang, Junbo Deng</i>	
A study of grounding electrode discharge in soil under negative DC voltage.....	127
<i>Yuxin Lu, Ruohan Wu, Chuan Li, Yong Yang</i>	
Effect of AC Voltage Amplitude on Surface Discharge in SF6/N2 Gas Mixture under AC/NLI Superimposed Voltages	132
<i>Yang Zhou, Lin Niu, Xuan Meng, Xutao Han, Xuanrui Zhang, Junhao Li</i>	

Mechatronics and Intelligent Sensing Technology

Speed Control and Regenerative Braking of PMDC Motor using SiC MOSFET-based DC-DC Converter	138
<i>Jorge Luis Aguilar Martinez, Fuat Kucuk</i>	
Harmonic Losses Minimization of a Dual-Three Phase Induction Motor by Dynamic Input Allocation Control	143
<i>Angelo Accetta, Silvia Di Girolamo, Filippo D'Ippolito, Massimiliano Luna, Marcello Pucci, Antonino Sferlazza</i>	
Sensorless Temperature Estimation of Squirrel Cage Induction Motor Using Transient Low Order Lumped Parameter Thermal Network Model	149
<i>Rohan Derek Mendonca, Fuat Kucuk</i>	
An Enhanced Dataset for Axial Flux Machine Performance Study.....	155
<i>Jinlong Li, Zhuang Xu, Bowen Lei, Ahmed Nasr Abdelwahed, Weinong Fu, Nadia M. L. Tan</i>	
Instantaneous Rotor Position Estimation of a BLDC Motor Using a Low-Resolution Hall Sensor	161
<i>Shun Mizutani, Fuat Kucuk, Yu Than</i>	
Transfer Learning Enhanced High-quality Dataset Generation for Axial Flux Machine	166
<i>Jinlong Li, Zhuang Xu, Bowen Lei, Weinong Fu, Nadia M. L. Tan</i>	
A Torque-Speed Control Strategy for Brushless DC Motors with 180° Commutation.....	172
<i>Ziliang Feng, Ekamjot Singh Tahim, Juri Jatskevich</i>	
Parameter Extraction of Electromechanical Oscillations in Power Systems Based on EMD-DMD	178
<i>Xu Risheng, Guo Shujia, Wu Di, Liu Xu</i>	

Insulation Materials and Electrical Performance Evaluation

Design and Analysis of a Composite Electromagnetic Absorber Based on Plasma and Metamaterial Integration.....	183
<i>Huanyu Shi, Yong Yang, Zhengzheng Liu</i>	
Comprehensive Investigation of JTT Geometries via TCAD for Enhanced Static Performance in Field-Plated p-GaN HEMTs.....	189
<i>Zonghao Zhang, Jiexiang Hu, Jinhong Shi, Wenjun Li, Yuxiang Pang, Zhentao Xiao, Qijun Cai, Jiale Liu</i>	
Vibration Characteristics and Equivalent Assessment Method of Nanocrystalline Cores under Non-Sinusoidal Excitation.....	194
<i>Na Wang, Wenzhao Wang, Lu Chen, Shengchang Ji</i>	
High-Thermal-Conductivity GFRP for Dry-Type Air-Core Reactors: Thermal and Electrical Characterization.....	200
<i>Yanze Song, Qiqiang Chen, Jun Xie, Guishu Liang, Qijun Duan, Haoou Ruan, Yuyao Zhong, Qing Xie</i>	
Movement and Aggregation Laws of Fiber Impurities in the Insulating Oil Under Multi-Physical Fields.....	206
<i>Sihang Gao, Chen Chen, Lijun Yang, Jianyi Wang</i>	
Effect of Siloxane-epoxy Monomer's Filler-like Behavior in Crosslinked Networks on the Electrical and Mechanical Performance of Epoxy Resin.....	212
<i>Kai Yin, Haoou Ruan, Jing Li, Xiangrong Chen</i>	
Aging Effects on Polymeric Insulator Degradation: A Numerical Modeling Approach.....	219
<i>Minhee Kim, Seuggun Yu, Ik Su Kwon, Jae Hyeon Ha, Yonghee Kim</i>	

Dielectric Characterization of Electronic Materials Using a Planar Microwave Sensor with a Complementary C-Shaped Resonator 226

Pongphan Leelatien

Design Concept and Experience for the Supply, Install and Commissioning of 132kV XLPE Submarine Cable from Kuala Perlis to Teluk Apau, Kedah Darul Aman, Malaysia..... 231

Ir. Ts. Hj. Tengku Izzudin bin

Decomposition Products of CF₃SO₂F/N₂ Mixed Gas under Local Overheating Defect..... 238

Zhigang Wang, Wenke Li, Ning Lv, Yu Zheng, Xinbiao Li, Chenyi Liu

Design and Research of Microfluidic Impedance Sensor for Distinguishing Impurity Properties in Insulating Oil.... 243

Sihang Gao, Chen Chen, Lijun Yang, Jianyi Wang

Dual-Expert Learning with Multiscale Wavelet Analysis for Imbalanced Blade Icing Detection..... 249

Mengna Liu, Shanshan Qi, Tianjiao Li, Xu Cheng, Xiufeng Liu, Shengyong Chen

Equipment Control Model and Reliability Evaluation in Digital Power System

Design and Analysis of Energy Harvesting from Overhead Power Lines for A Unmanned Aerial Vehicle 256

Kun-Long Chen, Mao-Long Chen

Optical Modulation-Based DC Electric Field Measurement Using Pockels Effect under Ion Flow Conditions..... 261

Yang Yufan, Takahiro Umemoto, Masahiro Sato, Takashi Fujii, Akiko Kumada

Frequency Regulation Ancillary Service Strategy and Benefit Analysis for Typical Flexible Load 267

Shanquan Pi, Youzhuo Zheng, Hengrong Zhang, Yuduo Xiao, Shiqi Bian, Siyang Liao

Improving Wind Speed Forecasting using a Novel hybrid model of Convolutional Neural Network and Transformer with Multi-head Attention Mechanism 273

Thu Nguyen Thi Hoai, Ky Pham Phong, Tuan Anh Nguyen Trung, Bach Do Xuan

Power Characterization Modeling of Lithium-ion Batteries under Shipboard Swaying Conditions..... 279

Yingbing Luo, Peng Wu, Laiqiang Kong, Hailong Zhang, Sidun Fang, Ruijin Liao

Multi Life-Stages Single Proton Exchange Membrane Fuel Cell Aging Prediction 287

Yassine Toughzaoui, Abdelilah Hammou, Raffaele Petrone, Hamid Gualous

Modeling Methodology for Cascade Utilization of Waste Heat in Integrated Cooling, Heating, and Power Systems for HVDC Converter Stations 293

Qihao Zhang, Jiehai Xu, Weijie Zhao, Sidun Fang, Chengjun Zhou, Wei Xiao, Shaojie Chen, Haofeng Zhang, Zheng Zhong

Novel Generator System Design and Functional Control

Analysis and Performance Comparison of Resonance-Based Fault Current Limiters for Transient Stability in Steam Turbine Generators 299

Slava Demin, Eduard Petlenkov, Juri Belikov, Eli Barbie, Dmitry Baimel

The Impact of the Automatic Voltage Regulator on Synchronous Generator Oscillations..... 306

Jožef Ritonja, Boštjan Polajžer, Robert Brezovnik

Fault-Tolerant Control Strategy for High-Voltage Fault-Tolerant Permanent Magnet Synchronous Generators under Open-Circuit Faults	312
<i>Pengzhao Wang, Xiangjun Zeng, Fang Wang, Wei Song, Wei Ran, Yiping Luo</i>	
Neural Network-Based Aggregated Modeling of Multiple Synchronous Generators with Heterogeneous Parameters	317
<i>Xin Wang, Arash Safavizadeh, Juri Jatskevich, Guangchao Geng, Quanyuan Jiang</i>	
Estimating Rotor Speed Stability of Self-Excited Induction Generators.....	323
<i>Jian Hong Liu, Hsiang Chen Hsiao</i>	
Machine Learning-Based Optimal Location Selection Method for Transmission Generator Integration	329
<i>Woo Yeong Choi, Yilu Liu, Hongyu Li</i>	
Predictive Coordinated Yaw Control for Wind Turbine Cluster Based on Deep Reinforcement Learning	335
<i>Qinkai Cao, Jiayang Chen, Xin Liu, Jingjia Yu</i>	
A Linear Transformation-based Temporal-Continuous Approach of Aggregating GDERs.....	341
<i>Zhaocheng Zhang, Mingyu Yan, Yize Liu, Tianyu Sima, Chunmiao Zhang, Yijia Zhou</i>	
Transient Stability Analysis of Wind Turbine Tied to DRU-HVDC.....	347
<i>Ziyu Fu, Zimo Zhao, Wenhao Tong, Zhiyuan Wang, Lujie Yu</i>	
Design of a Bladeless Wind Turbine with a Multiple Linear Generator Configuration and Spring Mechanism.....	353
<i>Rae Jonah Isaac Diego, Paolo Yuan L. Magno, Conrado F. Ostia Jr.</i>	
Precise Lifetime Assessment of Key Equipment in Wind Turbines and Lifetime-Constrained Optimal Power Dispatch Strategy for Wind Farms.....	359
<i>Yuan Gao, Lucheng Hong, Xingrui Zhang, Aihua Zhou, Minghe Wu, Ai Du</i>	

Fault Diagnosis and Equipment Status Monitoring in Intelligent Power Systems

Risk Assessment Method for Commutation Failure of HVDC After Large Disturbances in Modern Power Systems	367
<i>Hongjian Sun, Yongzhen Wang, Jian Wang, Caihai Zou, Runjia Sun, Zongshuai Jin, Chen Feng</i>	
Transient Frequency Indicator Estimation Incorporating Fault Ride-Through Recovery Dynamics of Power Electronic Devices	373
<i>Bowei Dai, Cong Li, Chao Duan</i>	
Identification and Repair of Smart Grid Faults After Storm Tide Disasters Based on InceptionTime and Deep Reinforcement Learning	382
<i>Haotian Guo, Keng-Weng Lao, Junkun Hao, Xiaorui Hu</i>	
Rapid Evaluation of Post-fault Steady-state Frequency Considering State Switching.....	389
<i>Cong Li, Zhenjun Gao, Xiaoqi Zhang, Chao Huo, Xuetao Dong, Ping Wei, Chao Duan</i>	
Master-Slave Cooperative Optimization for Power System Restoration Considering Communication Failure	396
<i>Tong Zhou, Zongshuai Jin, Runjia Sun, Jingbo Zhao</i>	
Determining Substation Equipment Importance in the Presence of Failure Risk Inaccuracy	402
<i>Guido Andreesen, Madis Leinakse, Mart Landsberg, Jako Kilter</i>	

Stage-Wise Calculation of Short-Circuit Fault Currents in M3C-Based Offshore Wind Power Flexible Low-Frequency Transmission Systems..... 408

Chenxing Wang, Long Pang, Jianchao Li, Pengfei Li, Hailong Cheng, Shulai Wang

A Partitioning-Coordinated Fault Restoration Strategy for Distribution Networks Considering Mobile Energy Storage Systems..... 414

Jiawang Ji, Sidun Fang, Tao Niu, Bo Jie, Guanhong Chen, Ruijin Liao

Digital Twin Health Assessment System for Power Equipment Based on Data Fusion

Use of Eigenvalues in Stability Studies: Different Interpretations in Dynamic System Analysis and Modal Voltage Analysis 421

Nafiu Nawar, Eklas Hossain

Design and Implementation of Threshold-Free Adaptive Sliding-Mode Speed Controller and Observer for SPMSM System 426

Shaocheng Qu, Xiang Cheng, Changfan Zhang, Jing He, Yi Su

Sample Augmentation for Power System Transient Stability Assessment Based on Sensitivity Analysis and Key Parameter Adjustment..... 434

Shuolin Zhang, Jiongcheng Yan, Yixuan Peng, Changgang Li, Pengfei Song, Pengpeng Kang, Wenhui Zhai, Xiaoyu Tian

Multi-Stage Optimization Model Development Using Optimization Tool for Isolated Hybrid System 440

Muhammad Reza Pratama, Kevin Marojahan Banjar-Nahor, Mochammad Aldyan Nur Cahyadi, Rizky Gusti Pratiwi, Nanang Hariyanto

Enhance the Performance of Piezoelectric Vibration Energy Harvester via U-Shaped Dynamic Magnifier 446

Yu Qiu, Xiaoquan Chu, Pengfan Wu, Fayang Wang

Alternating Optimization Method for Virtual Inertia and Virtual Damping within Hybrid Systems 450

Boyan Zhao, Yue Fan, Xiaowei Ma, Yuwen Qin, Chao Duan

Flexibility assessment of production-storage-ventilation-air conditioning systems based on cleanroom thermal inertia 458

Junyao Gao, Jinfei Meng, Yuming Zhao, Xiandong Xu, Yuhan Liu, Yuze Zhao

Construction of Electric Vehicle Charging Stations and New Power Supply Technologies

Impact of EV Charging on Voltage Margin in High PV Penetration Tourist Regions..... 464

Jun-Hyuk Nam, Dong-Il Cho, Yun-Jin Cho, Seong-Jun Park, Byung-Ki Kim, Won-Sik Moon

EV Aggregation and Low-Carbon Scheduling in Virtual Power Plant: A Zonotope-Based Approach..... 470

Yongji Ma, Huifang Wang, Qi Zhang, Jianan Yu

Rectified Flow-Augmented Offline DRL for Cost-Efficient EV Charging Station Management 476

Hao Li, Bin Zhang, Tao Qian, Qinran Hu

A Reliability Study of Electric Vehicle Charging Infrastructure Using Weibull Distribution 482

Satya Vikram Pratap Singh, Zakir Hussain Rather

Probabilistic Multi-Scenario Revenue Analysis for Vehicle-to-Grid: A Case Study of China	488
<i>Muchun Wan, Yingning Huo, Lin Xia, Xiao Hong, Quanyuan Jiang, Guangchao Geng</i>	
Coordinated Optimization for the Photovoltaic Integration with Electric Vehicles.....	494
<i>Hongyu Long, Yijun Dong, Shun Pan, Sungyun Choi, Zhen Wang, Xuehan Zhang</i>	
Optimization Configuration and Intelligent Operation in Distribution Network	
A Voltage Violation Risk Assessment Method for Active Distribution Networks Based on Cross-Time Domain Adaptive Networks	500
<i>Kexin ZHANG, Xiaobo DOU, Zaijun WU, Xiaotong ZHANG, Yongqing LV, Yanlun LI</i>	
A Two-Level Collaborative Voltage Optimization Control for Photovoltaic and Energy Storage Systems in Active Distribution Networks	506
<i>Tong He, Yusong Yang, Runfan Zhang, Hongrui Lu, Zixuan Liu, Zhaohong Bie</i>	
Optimal Configuration Method for Electric-Hydrogen Coupled System in Distribution Networks Considering Multi-Timescale Power Balance.....	512
<i>Ziqiu Wang, Lucheng Hong, Minghe Wu, Ai Du</i>	
Optimization-Based Hosting Capacity Assessment for Distribution Networks under Multiple Constraints Using a Two-Stage Approach	518
<i>Adhyatma Aulia Rizqi Leksono, Kevin M. Banjar-Nahor, Nanang Hariyanto</i>	
Parameter Identification of Distribution Network Based on Neural Network Data Processing Considering Data Imputation.....	526
<i>Di Huang, Weiyan Zheng, Bin Zhou, Xingping Yan, Weimin Lu, Chaoyue Zhu</i>	
Resilience-Oriented Distribution Network Restoration Optimization and Disaster Recovery Capability Assessment Method Considering Soft Open Points	531
<i>Longteng Wu, Ruijin Huang, Zheng Zhou, Yiheng Bian, Gengfeng Li, Dingyuan Luo</i>	
Development and Application of Superconducting Cable Quench Protection Device for Distribution Network	538
<i>Bing Song, Xiao Cheng, Yuhan Zhou, Zhe Zhang</i>	
Deeply Collaborative Thermal Power Strategy for Agricultural Integrated Energy System Considering Carbon Emissions.....	544
<i>Hailong Zhang, Yingbing Luo, Sidun Fang, Tao Niu, Shijun Wang, Ruijin Liao</i>	
Distribution Losses Projection based on Asset and Target Sales Energy.....	549
<i>Pradita Octoviandiningrum Hadi, Nanang Hariyanto</i>	
Applying Fine-tuned Large Language Model to Distribution System State Estimation	554
<i>Gao Mingyang, Zhou Suyang, Zhuang Wennan, Fan Jili, Liu Haiquan, Zhou Aihua</i>	
Joint Allocation of Flexible Resources in Distribution Systems to Enhance Resilience Considering Resist, Response and Restoration Stages.....	560
<i>Shunyao Zhang, Yiheng Bian, Di Zhang, Runze Han, MingXuan Jiang, Gengfeng Li</i>	
Enhanced Gradient-Optimized Tree Boosting Approach for Distribution System State Estimation Considering Non-Gaussian Colored Noise	566
<i>Himani Mattoo, Muneeb Mushtaq Sheikh, Anirban Dasgupta, Sreenath J.G, Praveen Tripathy</i>	

Key Technologies in Distribution Networks and Distribution Systems

Research on distribution network damage sensing model and method to cope with typhoon disaster	572
<i>Longteng Wu, Ruijin Huang, Dingyuan Luo, Yiheng Bian, Gengfeng Li, Zheng Zhou</i>	
Optimal Mitigation of Voltage Unbalance on Distribution Networks with Distributed Energy Resources.....	577
<i>Jinxuan Liu, Yanjian Peng, Runze Yuan, Zhicai Liang</i>	
Reinforcement Strategy for Distribution Networks with Distributed Generation under Typhoon Disasters.....	583
<i>Qirui Shen, Chenwei Gao, Yuxiong Huang, Fujia Han, Ji Qiao, Zhen Zhang</i>	
Convergence-Enhanced Distribution Network Digital Twins via Logic Tensor Network.....	589
<i>Zeyuan Niu, Yang Gao, Qian Ai</i>	
A Probabilistic Characterization Method for the Aggregated Scheduling Boundary of the Transmission and Distribution Demarcation Point in Active Distribution Networks Considering Renewable Energy Uncertainty	595
<i>Fan Gong, Sitong Li, Hongda Yang, Zhaolong Wang, Hao Zhang, Yuzhen Han, Botao Li, Changen Song, Chengfu Wang, Ruoxi Cheng</i>	
Analyzing the Reactive Power Compensation Influence on Small Oscillation in Distribution Network Operations ..	601
<i>Luu Huu Vinh Qunag</i>	
Reliability and Economic Evaluation of MVDC Distribution Network Protection System Design.....	607
<i>Yun-Jin Cho, Jun-Hyuk Nam, Dong-Il Cho, Won-Sik Moon</i>	
A rapid reliability assessment method for a distribution network with energy storage	613
<i>Qi Liu, Jianfeng Zhu, Tiantian Guo, Pin Jia, Pengfei Ren, Jiuhong Guo, Zhonglin Hu, Yong Wang</i>	
Abnormal Operation Status Identification Method for Distribution Networks with Distributed Generation.....	619
<i>Xulin Zheng, Yilan Yu, Likun Chen, Zongyuan Xie, Runsheng Zheng, Lei Shang</i>	
A Safe Reinforcement Learning Approach Integrated with Weather Forecasting for Real-time Optimal Operation of Distribution Networks	624
<i>Hanxiao Wu, Yahan Dong, Jun Ke, Xu Wang, Chuanwen Jiang, Jianmin Liu, Bo Jie, Leijiao Ge</i>	
Dynamic Topology Tracking of Distribution Networks Based on Sliding Time Window Strategy with Graph Convolutional Networks.....	633
<i>Chenglong Yu, Donglei Cao, Junjun Xu, Peng Du</i>	
Intelligent Restoration of Power Distribution Networks with Reinforcement-Enhanced Multi-Objective Evolution	640
<i>Mengke Du, Sidun Fang, Tao Niu, Guanhong Chen</i>	
Resilience Enhancement of Distribution Systems through Transactive Demand Response.....	646
<i>Ruilai Xin, Hao Wu, Yuli Liu, Kai Hou</i>	
Research on Line Loss Prediction Method for Low Voltage Distribution Stations Based on GWO-SVMD and LSTNet	652
<i>Yifan Liu</i>	

Artificial Intelligence Technology and Data Analysis in Intelligent Power Systems

Artificial Intelligence-Based Optimization of Vehicle-to-Grid Scheduling for Real-Time Operation	658
<i>Mohammad Javad Salehpour, M.J. Hossain</i>	

Identification of Hidden Parameters in Complex Systems Based on Random Matrix Theory.....	664
<i>Yikang Bu, Xing He, Qian Ai, Fujia Han, Ji Qiao, Zhen Zhang</i>	
Thermoeconomic Optimization of Absorption Refrigeration System Using Converter Valve Waste Heat.....	673
<i>Qihao Zhang, Dan Wang, Ditian Liang, Sidun Fang, Youming Zuo, Wei Xiao, Shaojie Chen, Haofeng Zhang, Zheng Zhong</i>	
A GIS Integrated Framework for Optimal Planning of Ethiopian Onshore Wind Power Plants under Multiple Constraints.....	678
<i>Wenfa Kang, Yajuan Guan, Yun Yu, Sen Tan, Solomon Feleke, Mulat Azene, Degarege Anteneh, Goran Strbac, Juan C. Vasquez</i>	
Electrified Shipboard Dynamic Positioning System Control Strategy Integrated with Physics Constraints under Harsh Marine Environments.....	684
<i>Jiangfan Huang, Yingbing Luo, Sidun Fang, Tao Niu, Guanhong Chen, Ruijin Liao</i>	
Non-Intrusive Load Disaggregation Based on TimesNet and Transfer Learning.....	689
<i>Qifang Chen, Jiayi Yu, Mingchao Xia, Guangyu Liu, Chong Meng, Qianhao Sun, Yubin Wang</i>	
Projecting Future Trends in Japan’s Electricity Position: A Data-driven Analysis using Monthly Statistics from OECD Members.....	695
<i>Amy Poh Ai Ling, Karen Guo, Kenji Tanaka, Yung-Jen Lin Guo</i>	
Heterogeneous Energy Coupling-Based Synergistic Optimization for Grid-Interactive Operations in Steel Industry.....	701
<i>Xiao Hu, Weijie Li, Jinduo Yang, Shuaizheng Wang, Jiaquan Yang, Shili Wang</i>	
Enhancing Reliability in Regional Power Grids: Condition Monitoring, Protection and Health Management	
Coordinated Planning of Autonomous Electric Vehicle Fleets and Infrastructure in Coupled Transportation-Power Networks.....	707
<i>Huayu Zhang, Bing Han, Fei Xue, Shaofeng Lu, Lin Jiang</i>	
Comparative Performance Analysis of Grid-Following and Grid-Forming Inverters in Diverse Grid Conditions.....	713
<i>Nafiu Nawar, Eklas Hossain</i>	
A Multi-Criteria Optimization for Parallel System Restoration Planning in Power Grids with PV-BESS.....	718
<i>Hasini De Silva, Adland Pradana, Mithulananthan Nadarajah</i>	
Addressing corona-effect for power networks in South Africa using image classification and Machine Learning.....	724
<i>Boitumelo Phetla, Sibonelo Motepe, Ali N. Hasan</i>	
Reliability Assessment of Power Conversion System Considering Lifetime Damage of Key Components.....	731
<i>Xingrui Zhang, Lucheng Hong, Yuan Gao, Ai Du, Minghe Wu, Jie Gu</i>	
Improved SVM based on Feature Screening and Pelican Optimization Algorithm for Cost Level Prediction of Substation Projects in Shanghai Power Grid.....	737
<i>Qiong Wang, Ting Li, Peiwen Wang, Runkun Yao, Yong Zhang, Yanan Kong</i>	
A Linearized VPP Optimal Dispatch Model Considering Demand Response Accurate Regulation and Network Operation Constraints.....	745
<i>Yansong Mei, Yu Guo, Yuhao Zhang, Shaocong Wu, Tianguang Lu</i>	

Advancements of Microgrids for Sustainable Energy Systems

A Robust Co-Design Method for Ensuring Stability in Observer-Integrated Microgrids Under Sensor Attacks.....	752
<i>Sen Tan, Peilin Xie, Juan C. Vasquez, Baoze Wei</i>	
Distributed Scheduling of Low-Inertia Microgrid Clusters with Grid-Forming Energy Storage.....	758
<i>Yilin Bai, Chenghao Lyu, Jiahui Gong, Zhengxiang Song, Kun Yang, Jinhao Meng</i>	
Research on Power Allocation Strategy of Multiport Energy Router in Expressway Microgrid	763
<i>Pengfei Du, Hanqing Wang, Ruihua Li, Bo Hu, Jian Fang, Ziqiao Zhang</i>	
Interactive Imitation Learning for Real-Time Energy Management in a Residential Microgrid.....	769
<i>Jiahui Gong, Zhengxiang Song, Bo Li, Yilin Bai, Baiqin Feng</i>	
Time-Varying Hybrid Observer for Load and State Estimation in DC Microgrids.....	776
<i>Abdelilah Benrekia, Giovanni Garraffa, Ivan Marchese, Massimiliano Luna, Marcello Pucci, Vincenzo Leonardi, Antonino Sferlazza</i>	
Simulation-Enabled Closed-Loop Static-Dynamic Co-Optimization for Grid-Impact-Aware Microgrid Dispatch	782
<i>Chenghao Lyu, Yilin Bai, Jiahui Gong, Yuchen Zhao, Jinhao Meng, Zhengxiang Song</i>	
Optimal Scheduling of Multiple Microgrids with CVaR and Demand Response	788
<i>Liu Haiquan, Zhou Suyang, Gao Mingyang, Fan Jili, Zhuang Wennan, Zhou Aihua</i>	
Optimal Battery Life Cycle Management in PV/Wind/Diesel/Fuel Cell Based DC Microgrids using Secretary Bird Optimization	794
<i>Manoj B. Lonkar, Sushil S. Thale</i>	
Fault-tolerant control strategy for microgrid sensor fault event triggering based on T-S fuzzy observer	802
<i>Xiaotong Zhang, Xiaobo Dou, Qinran Hu, Kexin Zhang, Yanlun Li, Congyue Zhang</i>	
A Communication-Assisted Protection Scheme for Medium Voltage Distribution Lines in Inverter-Based Isolated Microgrids	808
<i>Abbas Hasani, Xiaodong Liang, Bo Jie, Kent Saylor</i>	

Probability Prediction and Calculation Model for Power Load

A Calculation Method for the Maximum Adjustable Capacity of Polysilicon under Process Constraints	814
<i>Wuxiao Chen, Yuqing Cai, Zhijun Jiang, Xuan Deng, Zhexin Lin, Yihao Zou</i>	
Scheduling Optimization Strategy for Electric Fishing Vessels in Offshore Fish Farms toward Source-Load Balancing	820
<i>Zhenyu Cui, Juan Su, Yi Lin, Jingyi Lin, Min Dong, Qian Cao, Jian Wei</i>	
Two-Stage Adaptive Robust Optimization Model for Joint Unit Maintenance and Unit Commitment Considering Source-Load Uncertainty.....	826
<i>Hongrui Lu, Yuxiong Huang, Tong He, Gengfeng Li</i>	
A Hybrid GBM-LSTM and Feature Engineering Residual Learning Approach for Medium-Term Load Forecasting Framework in Resource-Constrained Power Grids	831
<i>Anas Th. Mustafa, Omar Sh. Al-Yozbaky</i>	

Power and Electricity Balance Assessment for Renewable Power Systems via Time-Series Production Simulation with Source-Load Uncertainty.....	837
<i>Haoliang Zhao, Hongrui Lu, Yuxiong Huang, Qirui Shen</i>	
Load Rebound Effect in Demand-side Flexibility: Analyzing the Impacts on Grid Stability	843
<i>Arqum Shahid, Argo Rosin, Roya Ahmadiyahangar, Tarmo Korõtko</i>	
Digital Twin Technology Applications in Integrated Energy System	
Adaptive Learning Rate-Enhanced XGBoost for Smart Home Energy Forecasting with Solar Energy System Integration.....	848
<i>Banafshe Parizad, Ali Jamali, Hamid Khayyam</i>	
Feasible Region Characterization for Uncertainty TVPP Considering Ramping Constraints	853
<i>Peng Hao, Chunyi Huang, Ziyang Xiang, Weidong Hu, Kangping Li, Zhenghui Li, Zihang Song</i>	
A Multi-stage Resilience Enhancement Method for Integrated Energy Systems Considering Gas/heat Dynamic Characteristics	858
<i>Mingxuan Jiang, Yiheng Bian, Gengfeng Li</i>	
Multi-entity Economic Dispatch of Electricity-Heat-Hydrogen-Methanol Integrated Energy System Based on TOC Multi-Energy Flow Constraint Chain	865
<i>Dingran Cheng, Yang Cui, Yang Xu, Han Zhu, Shuo Wang, Zhi Zhang, Fuxuan Ge, Jianpeng Ni</i>	
Resonance Modal Analysis and Mechanism Research of the Islanded Source-Load-Storage System.....	874
<i>Lin Han, Lucheng Hong, Yumeng Huang</i>	
A Network-Cognizant Bid-Based Transactive Energy System Design	880
<i>Rui Cheng, Hairong Feng, Huanyu Zhang, Yang Xu, Gengming Liu, Wenxia Liu</i>	
Optimal Strategy for Smart Pole-Based Multi-Energy System Considering Sleep Mechanism of 5G Base Station ...	886
<i>Ai Du, Lucheng Hong, Zihan Zhu, Yuan Gao, Ziqiu Wang, Xingrui Zhang</i>	
Cost-Efficient and Resilient Operation of an Islanded Hybrid Energy System Using an Adaptive Robust Uncertainty Modeling Method	893
<i>Mehrdad Ghahramani, Daryoush Habibi, Asma Aziz</i>	
Cyber-Threat Detection for Distributed Control against FDIA in Energy System.....	901
<i>Ziyang Wang, Shaohua Yang, Hongxun Hui, Ye Chen</i>	
Comprehensive Analysis of Grid Suitability for Integrating Grid-Forming SVG and STATCOM in New Energy Power Station.....	907
<i>Hongqiao Yin, Wu Cao, Liqun Sun, Shibo Wang</i>	
An Interval Predicting-Based Early Warning System for Supply-Demand Imbalance in Power Systems with High Renewable Penetration	913
<i>Xingyu Zhu, Zhiping Yan, Chenghao Liang, Xiyuan Zhou, Gaoqi Liang, Haifeng Wu, Junhua Zhao</i>	
Energy-Aware Cloud Service Pricing Scheme Considering Spatial-Temporal Characteristics of Electricity Cost.....	919
<i>Xinru Guan, Xinyu Duan, Shijie Chen, Wenyu Liu, Yimeng Sun, Yujie Cao, Xuan Wei, Zhaohao Ding</i>	

Safe Operation and Resilience Enhancement of Multi Energy Systems

Optimization of charging current constraint control strategy for heated tobacco product sets based on barrier function	925
<i>Qingyuan Zheng, Minghui Wang, Jian Sun, Kun Chen, Shiming Li, Tianyu Jiang, Haoxiang Zou</i>	
Resilience-Oriented Service Restoration Strategy in Integrated Electric and Heating System via Mobile Heat Sources	932
<i>Han Shi, Sheng Cai, Hao Wu, Kaige Liang, Chong Chen, Yunyun Xie</i>	
Power Flexibility Quantification of Vehicle-to-Grid as a Surrogate Model	938
<i>Yingning Huo, Muchun Wan, Wei Du, Jun Wang, Guangchao Geng, Quanyuan Jiang</i>	
Solar Power Forecasting Using Seasonal AutoRegressive Integrated Moving Average Model	944
<i>Abdelilah Hammou, Yassine Toughzaoui, Hamid Gualous</i>	
Research Method on Thermal Matching Characteristics of Waste Heat Cascade Utilization in the Combined Cooling, Heating and Power System of Converter Station	949
<i>Huqiang Yuan, Menglin Hu, Dan Wang, Sidun Fang, Chenyi Xiang, Wei Xiao, Shaojie Chen, Haofeng Zhang, Zheng Zhong</i>	
Univariate Ultra-Short-Term Wind Power Prediction Based on Hierarchical Trend Decomposition	958
<i>Shusheng Jin, Cheng Peng, Xiaodong Li</i>	
Continual Lifelong Learning for Non-Intrusive Load Monitoring	963
<i>Zihan Shan, Gangquan Si, Wenhan Tong, Minglin Xu, Jiangyu Liu</i>	
Sub/Super Synchronous Oscillations in Wind Power Generation Systems: Triggering Factors, Characteristics, and Analysis Methods	969
<i>Mirhamed Pourmirasghariyan, David Campos-Gaona, Panagiotis. N. Papadopoulos, Olimpo Anaya-Lara, Georgios Rogdakis, Helena Perze-Martinez</i>	
Consideration of Seasonal Differences in the Energy Optimization Planning of Converter Stations	977
<i>Qihao Zhang, Xiaowei Sun, Yongbing Lu, Sidun Fang, Juyi Zheng, Wei Xiao, Shaojie Chen, Haofeng Zhang, Zheng Zhong</i>	

Electricity Demand and Electricity Market Transactions

Equilibrium Analysis of Electricity-Carbon Coupling Markets Considering Competitors' Market Behavior	982
<i>Yanzhe Ren, Tao Long, Gengfeng Li, Runfan Zhang, Haochen Zhang, Zhaohong Bie</i>	
Research on Cross-Regional Negative Reserve Market Clearing Model Considering the Regulation Capability of External Power	988
<i>Chunying SHI, LIZI ZHANG, BO JIE, Jumpei BABA</i>	
Privacy-Aware Incentive-Based Demand Response Potential Prediction for Electric Arc Furnace Steelmaking	995
<i>Zihang Song, Kangping Li, Zhenghui Li, Chunyi Huang</i>	
Surrogate-Assisted Optimization with Dynamic Model Management for Combined Economic/Emission Dispatch	1001
<i>L.X. Zhai, J.H. Zheng, Zhigang Li</i>	

Optimal Demand Response Scheduling of Electrolytic Aluminum Considering Thermal Safety and Production Constraints 1006

Qiang Ye, Wuxiao Chen, Peng Zheng, Lingling Zhu, Yuqing Cai, Zhijun Jiang

Photovoltaic Grid Connected System and New Power Generation Technology

A Coordinated Control Method of PEM Electrolyzers Based on Dynamic Response to PV Fluctuations 1011

Zhangxi Wu, Bin Li, Jiawei He, Ye Li, Zhongjian Kang, Hongyang Zhang

Frequency Coupling Effects on the Admittance Modeling of Grid-Following Photovoltaic Inverters 1017

Yumeng Huang, Lucheng Hong, Yunyi Zhu, Lin Han

Data-Driven and Knowledge-Based Digital Twin Modeling for Distributed PV Systems 1023

Liang Ji, Jieni Chen, Peipei Yu, Xiao Chang, Shengwen Li, Qiteng Hong

Systemwide Forecasting of Behind-the-meter Distributed Photovoltaic Generation Using a Data-Driven Approach: Recent Developments in South Korea 1029

Jae-Kyeong Kim, Sangwon Min, Young-Min Choi, Jaehak Lim, Sanghyun Lee, Hyunchul Jeong

Photovoltaic Power Generation Prediction Based on Multi-Scale Graph Convolutional Network 1035

Fan Jili, Zhou Suyang, Gao Mingyang, Liu Haiquan, HongHua Xu

Improving the PV Power Generation Self-consumption Rate in Individual Dwellings Equipped with Electrical Water Heaters 1041

Oumaima Laguili, Julien Eynard, Stéphane Grieu

Author Index