

2019 IEEE Innovative Smart Grid Technologies – Asia (ISGT Asia 2019)

**Chengdu, China
21 – 24 May 2019**

Pages 1-730



**IEEE Catalog Number: CFP19ISK-POD
ISBN: 978-1-7281-3521-2**

**Copyright © 2019 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

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

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

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

IEEE Catalog Number:	CFP19ISK-POD
ISBN (Print-On-Demand):	978-1-7281-3521-2
ISBN (Online):	978-1-7281-3520-5
ISSN:	2378-8534

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

2019 IEEE PES Innovative Smart Grid Technologies Asia (ISGT2019)

Table of Contents

Preface	Ixiii
Conference Committee.....	Ixiv

◆ Grid Operation and Management

Reliability Analysis of Centralized Protection System Considering the Impact of Messages under Multi-operating States	1
<i>Yong Chen, Shengnan Li, Li Zhang, Bingcheng Liu, Hao Lu, Zhihui Dai</i>	
Dynamic Performance of a High Accuracy Generator Model for Stability Analysis.....	7
<i>Quincy Wang, Renke Huang, Song Wang, Ruisheng Diao, Yilu Liu</i>	
Condition-Based Maintenance of Protection Systems Based on Hierarchical Fuzzy Evaluation.....	13
<i>Yong Chen, Shengnan Li, Li Zhang, Jianshuo Han, Xiaoqiang Qiu, Zhihui Dai</i>	
Study of Superconducting Fault Current Limiters for MMC-MTDC with HVDC CBs	18
<i>Jianlong Sun, Xiao Han, Yan Li, Zheren Zhang, Zheng Xu, Yuzhe Xu</i>	
Numerical Calculation of Electric Field Safety Area of 10 KV Transformer Based on Maxwell.....	24
<i>Hao Chen, Ya Gao, Xiaosong Zhu</i>	
A Review on Dynamic Analysis Methods of Power System Frequency.....	27
<i>Yuqiang Hou, Jianbing Xu, Jiajia Wang, Xuelian Wu</i>	
Multi-machine Power System Stabilizers Optimal Design Considering Multiple Operating Modes.....	33
<i>Jianbo Yi, Guozhou Zhang, Qi Huang, Yufei Teng, Peng Zhang</i>	
Life Cycle Cost Analysis of Distribution Transformers Considering High Overload Capacity and Vegetable Insulating Oil	38
<i>Lin Gan, Wenxiong Mo, Jian Fang, Jian Jiang, Yi Rao, Yu Tan, Hang Zhang</i>	
Unreasonable Reactive Power Flow of Traditional SVC and a Novel SVC Model against It	43
<i>Huaichang Ge, Tianhua Chen, Hao Chen, Haoyin Ding, Qinglai Guo, Bin Wang, Fengda Xu</i>	
PSASP-Based City Grid Ring-Closing Strategy Research and Corresponding Risk Assessment	48
<i>Weiyang Zhou, Hua Li, Xiaoping Su, Tingting Xiang</i>	

Dynamic State Estimation of Distribution Network Base on Pseudo Measurement Modeling and UPF	54
<i>Biyun Chen, Hongbin Li, Xiangyang Su</i>	
A New Method for Characterizing Voltage Sag Tolerance	60
<i>Kai Ding, Wei Li, Pan Hu, Ying Wang, Jia-Ni Xie</i>	
Evaluation Method of Equipment Voltage Sag Sensitivity Based on Kernel Density Estimation	64
<i>Zhichao Lin, Busheng Luo, Zhijian Song</i>	
Division of Working Variable Domain Fuzzy PID Control for Valley Electric Phase Change Heat Storage	69
<i>Yu Hongxia, Yang Chengxiang, Zhao Qingqi</i>	
Research on Potential Evaluation Model of Electric Energy Alternative	74
<i>Yi Du, Kangli Xiang, Changyong Lin, Hongyang Lin, Xiazhe Tu, Huan Zheng</i>	
The Study on the Load Characteristics of the Induction Motor with Converter and Their Influence on under Voltage Load Shedding	78
<i>Nan Li, Xiaonan Yang, Feng Han, Yuxiang Li, Yunxu Hu, Yiping Yu</i>	
Modeling PV/PQ Switching in Security Constrained Optimal Power Flow	84
<i>Yunkai Lei, Ronghua Wang, Ting Li, Quan Tang, Yunling Wang, Jinyang Li</i>	
Transformer over Passivation to Prevent On-Load Tap Changer Silver Sulphide Corrosion	89
<i>Sameera Samarasinghe, Daniel Martin, Hui Ma</i>	
Research on Intelligent and Auxiliary Formulating Dispatching Plan Method for Large-Scale Power Grids	94
<i>Min Zhao, Fang Tian, Ping Ding, Yong Zhang</i>	
Probabilistic Load Forecasting via Point Forecast Feature Integration	99
<i>Qicheng Chang, Yishen Wang, Xiao Lu, Di Shi, Haifeng Li, Jiajun Duan, Zhiwei Wang</i>	
Regional Power Grid AGC Control Strategy Research Based on Q-Learning Algorithm under WACPB Mode.....	105
<i>Xiangyu Zhao, Gang Yao, Nianjie Tian, Jiang Dai, Huaying Su</i>	
Monthly Generation Unit Maintenance Optimization Method Considering Power Supply Capacity and Peak Regulation Capacity	110
<i>Zikun Zhu, Jianxin Zeng, Xiaoli Zheng, Cong Zhou, Quanchao Zheng, Nan Zhang</i>	
Reactive Power Provision for Voltage Support Activating Flexibility of Active Distribution Networks via a TSO-DSO Interactive Mechanism	116
<i>Kunjie Tang, Rui Fang, Li Wang, Junge Li, Shufeng Dong, Yonghua Song</i>	

Optimal Power Flow Calculation of Combined Electricity-Heat Power System Based on Alternating Direction Method of Multipliers.....	122
<i>Wei Du, Zhihong Yang, Guoxin He, Xiaochen Zhang, Junjie Ligao, Jun Yang</i>	
Static Security Assessment of Power System Considering Governor Nonlinearity.....	128
<i>Chengwei Fan, Zhen Chen, Xiaoru Wang, Yufei Teng, Gang Chen, Hua Zhang, Xiaoyan Han</i>	
An Out-of-Step Splitting Strategy Based on WAMS Information for Oscillation Center Migration under Multi-operation Mode.....	134
<i>Chunlei Xu, Lin Liu, Hangpeng Ni, Tao Lin, Ruyu Bi, Xunzhe Wang, Shuitian Li</i>	
Fault Line Selection of Single Phase Grounding Fault in Small-Current Ground System Based on Reactive Current	138
<i>Shilong Li, Yufei Teng, Xiaopeng Li, Huajie Zhang, Shilin Feng</i>	
Similarity Calculation Considering the Impact of Voltage Regulation	144
<i>Zeyang Tang, Defu Cai, Wenna Wang, Kan Cao, Xin Shu, Bingke Yan, Li Wan, Xiaodong Yu, Kunpeng Zhou, Yan Liu, Fei Yu, Dan Qiu</i>	
A Transmission System Planning Method Considering Risk Volatility and Capability of Accommodating Wind Power	149
<i>Bo Sun, Jubin Yan, Yuxuan Yang, Xiaoming Wang, Lin Zhang, Chao Wang</i>	
Analysis of a Relay Protection Responding to 220kV Transmission Line	155
<i>Huidong Guo, Zhenguo Ma, Mengqiong Wang</i>	
Supraharmonics Measurement Algorithm Based on CS-SAMP	160
<i>Xinggong Yang, Aiqiang Pan, Guangzheng Yu, Chenyang Li, Yangxiu</i>	
Impact of the UHVDC on Performance Characteristics of Power Grid	165
<i>Qiushi Xu, Xu Zheng, Aihong Tang, Shuyuan Zhang, Dechao Xu</i>	
Loss Comparison Study of MMC-HVDC and All-DC Offshore Wind Farm	171
<i>Weijia Tang, Mingming Shi, Zhen Li, Nayan Yu</i>	
Emergency Capacity Prediction of Direct Buried Cable under Rainfall Condition	176
<i>Haiqing Niu, Tinghan Song, Jia Yu</i>	
Hybrid HVDC System Parameters Tuning Based on Robust Multi-objective Optimization via Evolutionary Algorithms	181
<i>Jia Yang, Hongtao Yang, Fenqing Wei, Weiliang Li, Qipu Liu, Guoqiang Sun</i>	
Global Voltage Sensitivity Calculation for Power System Including Transmission and Distribution Networks.....	186
<i>Jierui Yang, Yujie Sun, Guopeng Liu, Xinhui Cui, Chengbin Wang, Kaigang Ma</i>	

Power Transmission Network Expansion Planning Research Considering System Weak Connection Recognition	191
<i>Chufei Xiao, Fei Tang, Dichen Liu, Yeyan Xu, Wen Jian, Mengjiao Qing, Qiang Zhao, Weiqiang Liang</i>	
Mathematical Modeling of Impedance during Power Swing as a Function of Time	196
<i>Aldrich Zeno, Jordan Rel Orillaza</i>	
Research on Quick Distributed Feeder Automation for Fast Fault Isolation/Self-Healing in Distribution Network	202
<i>Jie Zhou, Lu Wang, Mingxiang Liu, Pan Dai, Rongguo Hao, Yingyuan Zhang</i>	
Optimal Power Flow in Hybrid AC and Multi-terminal HVDC Networks with Offshore Wind Farm Integration Based on Semidefinite Programming	207
<i>Yuhao Zhou, Long Zhao, Wei-Jen Lee, Zhenyuan Zhang, Peng Wang</i>	
Research on Power Supply Recovery Scheme Based on Distributed Intelligence	213
<i>Jun Ying, Mingxiang Liu, Yalou Chen, Yue You, Wenlu Ji, Ming Zhang</i>	
Voltage Sensitivity Analysis and Demand Dispatch Option of Electric Vehicle in Smart Grid.....	218
<i>Muhammad Aqib, Abhisek Ukil</i>	
Optimal Allocation Method of Dynamic Reactive Power Compensation to Suppress Simultaneous Commutation Failure of Multiple DC Lines	224
<i>Wen Jian, Fei Tang, Chufei Xiao, Mengjiao Qing, Mengqi Qing, Weiqiang Liang, Fang Zhou, Hongsheng Zhao, Xiongguang Zhao</i>	
An MILP Model for Annual Power Balance Based on Monthly Multiple Typical Daily Load Scenarios	229
<i>Suituo Shao, Wei Yan, Yang Liu, Yingming Mao</i>	
Analysis of Coordinated Control Strategy for Large-Scale Renewable Energy VSC-HVDC Integration	234
<i>Yan Li, Zhibin Wang, Yongning Chi, Chunxia Wei, Hongzhi Liu, Haiyan Tang</i>	
Data-Driven Localization of Forced Oscillations in Power Systems.....	239
<i>Wenqing Li, Tong Huang, Nikolaos M. Freris, P. R. Kumar, Le Xie</i>	
Research on Power Capacitor Insulation State Detection Based on Polarization Depolarization Current Method	244
<i>Chenmeng Zhang, Shuping Cao, Xin Wang, Siwen Tan</i>	
Open-Circuit Fault Diagnosis for Modular Multilevel Converter Using Wavelet Neural Network.....	250
<i>Pu Lin, Zhaoyun Zhang, Zhi Zhang, Li Kang, Xinghua Wang</i>	
Research Concept of Pattern Features of Generalized Load Curves in Future Power Systems	256
<i>Jinghua Li, Changwei Lai, Bo Chen, Shanyang Wei, Qian Huang, Junjie Liang</i>	

A Novel Fault Section Location Method Based on Binary Global-Best Harmony Search Algorithm for Electric Power Distribution Systems	262
<i>Tao Jin, Siyuan Lu, Yizhen Zhang, Rodolfo César Costa Flesch</i>	
Research on Dynamic Voltage Characteristics of AC/DC Hybrid System Based on PET	270
<i>Zeming Zheng, Jinghong Zheng, Wenzhi Zhao, Zonghang Han</i>	
Adaptability Analysis of Distance Protection on the Transmission Lines Emanating from Renewable Power Generators	275
<i>Yu Fang, Ke Jia, Zhengxuan Zhu, Tao Feng, Zhe Yang, Bohan Liu</i>	
Two-Stage Topology Identification Method for Distribution Network via Clustering Correction	280
<i>Ye Chen, Jinming Chen, Hao Jiao, Yajuan Guo, Wei Jiang, Haibo Tang</i>	
Estimation of Power System Inertia Using System Identification	285
<i>Vasupalli Sagar, Sachin Kumar Jain</i>	
Analysis of Influence Factors on the Transmission Capability of the Yu-e Back-to-Back VSC-HVDC South Channel	291
<i>Xiaodong Yu, Zetang Yang, Kan Cao, Defu Cai, Li Wan, Kunpeng Zhou, Ying Wang, Raoyu Ze</i>	
Emergency Control Strategy of Ultra-Low Frequency Oscillations Based on WAMS.....	296
<i>Qin Liu, Gang Chen, Baisi Liu, Yudong Zhang, Chuyu Liu, Zhuolin Zeng, Chengwei Fan, Xiaoyan Han</i>	
An Optimal Control Strategy of Coordinated Recovery of Multi-infeed HVDC Systems	302
<i>Weiping Liao, Rui Zhou, Kun Xie</i>	
A Two-Steps Splitting Strategy Based on Laplacian Eigenmap Algorithm for Large Power Grid with Power Wind Connected.....	308
<i>Mengjiao Qing, Fei Tang, Mengqi Qing, Weiqiang Liang, Chufei Xiao, Wen Jian, Dichen Liu, Qiang Zhao</i>	
Transient Stability Analysis of AC/DC System Considering Electromagnetic Transient Model	313
<i>Qi Tao, Yusheng Xue, Chenhao Li</i>	
Asynchronous Distributed Dynamic Economic Dispatch in Active Distribution Networks	318
<i>Tong Xu, Wenchuan Wu, Jiaqi Chen, Qiuyu Lu, Yu Zhu</i>	
Topology Modeling Method for Distribution Network via Power Line Communication	323
<i>Jun Ying, Mingxiang Liu, Yalou Chen, Yue You, Wenlu Ji, Ming Zhang</i>	
Distributed Economic Dispatch for Active Distribution Networks with Virtual Power Plants	328
<i>Qiuyu Lu, Yinguo Yang, Yu Zhu, Tong Xu, Wenchuan Wu, Jiaqi Chen</i>	

An Evolution Algorithm of the Distribution Network Reconfiguration to Avoid the Infeasible Solution.....	334
<i>Yufei Rao, Weijun Teng, Zhaohui Li, Haijing Yang, Ze Gao, Jianbo Wang, Chunsun Tian, Yang Liu</i>	
Fault Analysis and Countermeasure of Arc Suppression Coil in 66kV System	340
<i>Qinghao Wang, Huiyan Cao, Tianshu Hai, Chenyang Liu, Wenfeng Hao, Yi Wang</i>	
Fault Diagnosis for HVDC System Based on Wavelet Entropy Clustering and DS Evidence Fusion Theory	344
<i>Chao Xing, Keqiang Tai, Yuhong Wang, Mingqun Liu</i>	
The Study and Application of Security Control Plan Incorporating Frequency Stability (SCPIFS) in CPS-Featured Interconnected Asynchronous Grids.....	349
<i>Yuqi Han, Wentao Zhang, Jun Wei, Xuna Liu, Shengyong Ye</i>	
Analysis and Treatment of 220kV Main Transformer Insulating Cylinder Discharge Failure	355
<i>Tianshi Wang, Tao Wang, Bo Liu, Xiaolei Yang, Shuyi Tao, Yingying Yang</i>	
Selection Method of Neutral Point Overvoltage Protection for 220kV Transformer.....	360
<i>Tao Wang, Qinghao Wang, Hui Chen, Chenghao Lan, Shuai Wang, Jianchun Xu</i>	
Short-Term Daily Load Forecasting in Distribution Power System Based on VMD & BA-LSSVM Combined Method	364
<i>Yuanhong Liu, Tao Wei, Wei Zhang, Mingze Zhang, Yinong Li, Xincong Li, Yu Zhang, Shuai Hao, Fengzhan Zhao</i>	
Economical Operation Optimization of Distribution Network Considering Multiple Adjustment Measures.....	369
<i>Jiancong Zhou, Taotao Hu, Lijuan Liao, Hongxia Gao, Jiajia Hu, Hui Wang, Jiayi Wang, Wenchao Shi, Jinyuan Liu</i>	
Research on the Adaptability of Hubei Power Grid after the Reinforcing Project of Hubei-Chongqing Back-to-Back VSC-HVDC	375
<i>Haiguang Liu, Wenna Wang, Defu Cai, Kunpeng Zhou, Kan Cao, Hongyu Bian</i>	
Reliability Evaluation of Distribution Power Unit Based on DG Power Contribution	380
<i>Mingze Zhang, Yinong Li, Xincong Li, Yuanhong Liu, Tao Wei, Wei Zhang, Shuai Hao, Yu Zhang, Fengzhan Zhao</i>	
A Method for Evaluation of Transmission Section Steady-State Security Region Considering Multiple Faults and Maintenance Mode of Power Grid	385
<i>Haiguang Liu, Kunpeng Zhou, Kan Cao, Chu Zhou, Defu Cai, Dan Xu</i>	
Faulty Feeder Identification Method in Resonant Grounding Distribution Network	391
<i>Xiuyong Yu, Liye Xiao</i>	
Hierarchical Optimization of Cross-Provincial Tie-Line Schedule Considering New Energy Consumption.....	396
<i>Zhi Cai, Dan Xu, Bo Li, Weiwei Yang, Yang Liu</i>	

Short-Term Voltage Stability Mechanism Analysis Based on a Double-Generator-One-Load Model.....	402
<i>Huaichang Ge, Chi Xu, Qinglai Guo, Jinyang Dong, Hongbin Sun, Bin Wang</i>	
Power Distribution Network Disconnection Fault Diagnosis Using Data Mining Method.....	407
<i>Qiqi Zhang, Siyi Liu, Yan Zhang</i>	
Research on the Load Model and Characteristics of Inverter-Fed Motors for Transient Stability Analysis	412
<i>Baorong Zhou, Siyu Lu, Haoqin Zhan, Fang Zhao, Zhaobin Du</i>	
On Application Specific Requirements of PMUs for Electricity Distribution Grids	418
<i>Yushan Hou, Vassilios G. Agelidis</i>	
Coordinated Planning of Storage Unit in a Remote Wind Farm and Grid Connection Line: A Distributionally Robust Optimization Approach.....	424
<i>Libin Yang, Rui Xie, Wei Wei, Cai Sun, Shengwei Mei</i>	
Network Connectivity Identification Method Based on Incidence Matrix and Branch Pointer Vector	429
<i>Lun Tang, Wei Tang, Xiaoqing Chang, Shumin Miao, Liang Wang, Xia Yuan</i>	
MMC-HVDC Fault Ride-through Coordination Control Strategy at Both Ends	434
<i>Guangqiang Peng, Yueyang Wang, Shiyu Chen, Yuhong Wang</i>	
Instantaneous-Power-Theory-Based Approach for Electromagnetic Transient Modeling of Loads at Bulk Supply Points	439
<i>Yizheng Xu, Hongying Peng, Xiaomin Qiao, Qing Mu, Dechao Xu, Xing Zhang</i>	
Modeling and Analysis of VSC-MTDC Transmission Systems.....	445
<i>Miaohong Su, Haiying Dong, Xiaojing Chen, Kaiqi Liu</i>	
Exploiting Unused Capacity in the Grid	451
<i>Jens Priebe, Niklas Wehbring, Hao Chang, Albert Moser, Huseyin K. Cakmak, Uwe Kuhnappel, Veit Hagenmeyer</i>	
Stochastic Geometry-Based Model for Spatio-Temporal Expanding Smart Grids	457
<i>Rachad Atat, Muhammad Ismail, Erchin Serpedin</i>	
A Small-Signal Sub-Synchronous Oscillation Analysis Caused by SVC in Weak-Link Power Grid	463
<i>Xinwei Sun, Hua Zhang, Huabo Shi, Xi Wang, Lun Tang</i>	
Comprehensive Stability Analyses for Hybrid AC/DC Microgrids with Multi-paralleled Interlinking Converters under Distributed Control	468
<i>Pengfeng Lin, Jinyang Fang, Chi Jin, Jianfang Xiao, Jinyu Wang, Koh Leong Hai, Peng Wang, Choo Fook Hoong</i>	

Research on On-line Monitoring Fault Diagnosis System of GIS UHF Partial Discharge	474
<i>Yifan Wang, Jinlong Gong, Zhenyuan Zeng, Zhaoqiang Wang</i>	
A Fuzzy Multi-objective Operation Strategy of Energy Storage System Based on Gravity Search Algorithm	480
<i>Rui Li, Menghua Fan, Haixu Song, Su Su, Wei Wang</i>	
A Decompositon Method for Weekly Unit Commitment Considering Hydro Power Characteristics	486
<i>Chenjia Feng, Chengcheng Shao, Shen Zhang, Yanan Wang, Ding Li</i>	
Sensitivity Vectors and Contingency Ranking Using Linearised AC Load Flow	491
<i>Priyanka Murali, Gopal Gajjar, S. A. Soman</i>	
Imprecise Risk Assessment of Distribution Network Based on Evidence and Utility Theory	497
<i>Zhuohui Guo, Jianbo Yi, Yanyang Fu, Qi Huang, Yufei Teng</i>	
The Quantitative Assessment of the Energy Consumption about Distribution Transformer for Charging Stations	502
<i>Yuqian Li, Jiandong Jiang, Kaibo Mai, Chen Feng, Wenwen Han</i>	
Impact of Utility-Scale Energy Storage Systems on Power System Transient Stability Considering Operating Uncertainties	508
<i>Xuekuan Xie, Yuchen Zhang, Ke Meng, Zhao Yang Dong, Junwei Liu, Shuoya Tang</i>	
Study on Lightning Intruding Overvoltage on DC Side of $\pm 1100\text{kV}$ Converter Station	514
<i>Jingqiu Yu, Zheng Xu, Bo Yue, Xuan Li</i>	
Security Constrained Unit Commitment Model for AC/DC Interconnected System.....	520
<i>Lili Li, Jiafei Huan, Yu Zhou, Zhixu Chen</i>	
Research on Load Rejection Protection of PWR Power Plants at Different Power Levels	525
<i>Wei Sheng, Zheng Xu</i>	
Evaluation Method for HVDC Commutation Failure Caused by Inrush Current	531
<i>Yufei Rao, Wei Cui, Chenghao Li, Yang Liu, Jianbo Wang, Hua Wang</i>	
Design of Online Detection System for Insulation Resistance of Electric Vehicle Based on Unbalanced Bridge.....	537
<i>Yongpeng Shen, Ankang Liu, Guangzhao Cui, Gaorui Ge</i>	
Quantifying the Performance of Pumped Hydro Storage in Supporting Renewable Integrated Power System	543
<i>Min Wei, Yan Luo, Wei Xu, Jie Sheng, Xiaorong Xie, Zhixue Li</i>	
A Dynamic Equivalent Method of Three-Sequence Network for Electromagnetic Transient Simulation.....	548
<i>Linchao Yang, Zheng Xu, Boliang Lou, Hua Zhou, Wen Hua</i>	

The Research on High Voltage Electronic Switch	554
<i>Rui Zhang, Hua Zhang</i>	
Data-Driven Short-Term Voltage Stability Prediction Based on Pre-fault Operating State	558
<i>Wenlu Zhao, Huaichang Ge, Qinglai Guo, Bin Wang, Yanling Du, Haitao Liu, Weimin Sun</i>	
On Multiobjective Optimization of Switch Allocation in Radial Distribution Networks	563
<i>Zbigniew Galias</i>	
Structural Dynamics Simulation and Engineering Application Analysis of 550kV GIL	568
<i>Yingqian Du, Zhijun Wang, Yapei Liu, Yongqi Yao, Tianshuo Yin, Bo Zhang, Hao Zhang</i>	
Smart Terminal Unit for Distribution Network with Model Verification Ability.....	574
<i>Jian Hu, Wenlu Ji, Peifeng Shen</i>	
Data-Driven Heuristic Optimization to Manage Congestion of Urban Power Grid.....	580
<i>Youbo Liu, Xi Zhang, Hongjun Gao, Chengzhi Zhu, Yiyang Yao</i>	
Transient Model Integrated Power Flow and Its Application in Electromagnetic Transient Simulation Initialization	587
<i>Shaowei Huang, Wei Wei, Ye Liu, Yankan Song, Ying Chen, Lun Tang, Bo Zhou</i>	
Review and Applications of Virtual Synchronous Machines Technologies	593
<i>Yingjun Liu, Mukai Hao, Yunpeng He, Chuanzhi Zang, Peng Zeng</i>	
Engineering Application and Operation Analysis of Virtual Synchronous Generators	599
<i>Xuekun Cheng, Hui Liu, Peng Song, Dawei Sun, Xiaosheng Wang, Yu Gong</i>	
Power System Virtual Inertia Implemented by Thermostatically Controlled Loads	604
<i>Zhe Wang, Yu-Qing Bao, Cheng Shen, Chen Chen</i>	
Modeling and Analysis of Super-Synchronous Oscillation in Converters-Dominated Power System Based on Multivariable Frequency Domain Method	608
<i>Yabing Yan, Weihua Zhou, Weijun Zhu, Siyuan Guo, Hao Xu, Ding Wang</i>	
Construction of Dispatching, Maintenance and Reconditions under Provincial-Municipal Integration System	613
<i>Jiayu Liu, Junhuan Yang, Luo Chen Shen, Yuan Tian</i>	
Research on Power Supply Capability Evaluation and Optimization Method for Distribution Network with Electric Heating Loads	619
<i>Mingxin Zhao, Hui Hui, Jian Su, Wei Liu, Tao Wei</i>	
Load Flow Calculation Considering Droop Control in Distribution Networks: A Convex Optimization Approach	625
<i>Weiye Zheng, David J. Hill, Wenchuan Wu</i>	

Research and Application of Waste Heat Recovery and Cascade Utilization for Low-Grade Flue Gas in Industrial Field	630
<i>Naili Guo, Zhen Yu, Liang Zhao, Mao Li, Jiebin Yang, Jun Tang, Qiang Li, Dong Li</i>	
Interval-Based Decentralized Dispatch Method for Coupled Transmission-Distribution System	636
<i>Peng Li, Ming Yang, Jiajun Yang, Bin Zhao, Yi Zhu, Liangjing Cao</i>	
Power System Transient Stability Margin Assessment Using Steady-State Information	642
<i>Jun An, Gang Mu, Zonghan Li, Daowei Liu</i>	
Minimizing Active Power Losses in Electricity Networks Based on Optimal Location of Battery Energy Storage System	648
<i>Salem Alshahrani, Muhammad Khalid, Mohammad Al-Muhaini</i>	
Synchrophasor Measurements for Power System Monitoring and Control under the Standard IEC/IEEE 60255-118-1	655
<i>Shi Bonian, Ken Martin, Allen Goldstein, Bill Dickerson</i>	
Effect of Forecast Accuracy on Day Ahead Prediction of Coincident Peak Days	661
<i>Jinxiang Liu, Laura E. Brown</i>	
Graph Computing Based Fast Screening in Contingency Analysis	667
<i>Yiting Zhao, Chen Yuan, Sun Li, Guangyi Liu, Renchang Dai, Zhiwei Wang</i>	
Fast Grid Splitting Detection for N-1 Contingency Analysis by Graph Computing	673
<i>Yongli Zhu, Lingpeng Shi, Renchang Dai, Guangyi Liu</i>	
A Robust Control Strategy for Air Conditioner Group to Participate in Power System Frequency Regulation	678
<i>Cheng Shen, Yu-Qing Bao, Tong-Zhou Ji, Jin-Long Zhang, Zhe Wang</i>	
Prediction for the Maximum Frequency Deviation of Post-Disturbance Based on the Deep Belief Network	683
<i>Yichao Zhang, Hongyu Zhu, Xiaoru Wang</i>	
Fault Location and Fault Type Recognition of Power System Based on Wavelet Transform	689
<i>Xiaotian Tang, Zhenyuan Zhang, Qi Huang, Yan Gong</i>	

✦ **Computational Intelligence Applications, Information and Communication Technologies (ICT), and Cyber-Security**

The Investigation of Dimensionality Reduction Method for State Evaluation of Oil-Immersed Transformer in 220kV Substation	693
<i>Xinghua Liu, Peng Gao, Kecun Han, Xuebin Lv, Chao Yang, Tongping Xie, Yang Yu, Peng Sun, Hongshun Liu, Jian Guo</i>	

Optimization of Black-Start Scheme for Mitigating Overvoltage.....	698
<i>L. Zhang, Z. X. Jing, T. Y. Ji, Y. Sun</i>	
Research on Pricing Segmentation Method of Electric Vehicle Charging Service Fee.....	704
<i>Juan Liu</i>	
Security Evaluation under N-1 for Active Distribution Networks Coordinated with Transmission Grid.....	710
<i>Zufeng Hou, Yuan Liang, Yong Zhang, Wei Wu, Jiaqi Chen</i>	
Research and Application Based on Network Security Monitoring Platform and Device	716
<i>Qingdong Meng, Dan Li, Yu Ma</i>	
Radial Distribution System Reconfiguration for Real Power Losses Reduction by Using Salp Swarm Optimization Algorithm	720
<i>Salah Kamel, Hanan Hamour, Loai Nasrat, Juan Yu, Kaigui Xie, Mansur Khasanov</i>	
Abrupt Change Detection of Home Electrical Appliance Signals Using Mathematical Morphology Gradient	726
<i>Lu Zhang, Zhaoxia Jing, Francois Auger, Xinglei Han, Sarra Houidi, Huu Kien Bui</i>	
Big Data in Power Systems: An Introduction to Julia Linear Models Using Tensor Flow	731
<i>Ebby Thomas</i>	
Design of Temperature Control System for Highprecision Position Sensor Calibration Thermostat Based on Fuzzy-PID Compensation.....	736
<i>Shujiang Li, Chi Ma, Wei Fu, Zhongshuang Li, Shaojia Tao</i>	
Analysis of Half-Wavelength Transmission Lines System State in Operation.....	741
<i>Weifang Lin, Jun Yi, Fangfang Yu, Junchuan Jia, Ansi Wang, Xinyue Wang</i>	
Research and Implementation of Electric-Communication Joint Teaching Platform Based on the IEC-103 Protocol	747
<i>Xinhao Bian, Jinrui Tang, Hui Hou, Xixiu Wu, Hongbo Yang</i>	
Root Cause Analysis of Abnormal Conduction of Electric Trigger Converter Valve in HVDC Projects	752
<i>Kun Liu, Zhen Wang, Jing Zhuang</i>	
Power System Real Time Reliability Monitoring and Security Assessment in Short-Term and On-line Mode	758
<i>Dajiang Wang, Yefeng Jiang, Chenguang Qiu, Hao Xiong, Mingde Bi, Yaming Ge, Jie Li, Yi Cao, Gang Li, Zhanfei Cui, Zhaoyang Yan, Tao Zhu, Yun Chai, Shoukui Zhang</i>	
Cloud-Supported Internet of Things Data Security and Access Control in Smart Grid	764
<i>Yalian Wu, Chengcheng Wu, Jian Hou, Ziqi Zhu, Mengbiao Huang</i>	
A Gossip-Based Asynchronous Distributed Algorithm for Economic Dispatch Problem with Transmission Losses	770
<i>Rui Wang, Qiqiang Li, Yang Shi, Luhao Wang</i>	

Influence of HVDC Reactive Power Compensation Modeling Method on Short-Circuit Current Calculation	776
<i>Ying Wang, Kunpeng Zhou, Kan Cao, Defu Cai, Haiguang Liu, Xuemao Zhao</i>	
Short-Term Load Forecasting of Smart Grid Based on Load Spatial-Temporal Distribution	781
<i>Gangui Yan, Tianyi Han, Wei Zhang, Shujian Zhao</i>	
Research of Typical Line Loss Rate in Transformer District Based on Data-Driven Method	786
<i>Bo Xu, Liming Wang, Yong Zhao, Shubo Liu, Xinran Li, Jinran Wang, Ling Liu, Guoqiang Sun</i>	
Short-Term Photovoltaic Output Prediction Method Based on Similar Day Selection with Grey Relational Theory	792
<i>Yang Cui, Jiarui Zhang, Wuzhi Zhong</i>	
The Study and Application of Field Test Technology of UHVDC Protection System.....	798
<i>Xiangping Kong, Peng Li, Xinyue Gong, Chi Zhang, Qiang Luo</i>	
Static Security Control Method to Solve UPFC near Area Equipment Overload.....	804
<i>Feng Li, Hui-min Peng, Hu-ling Yuan, Wei Li</i>	
Research on the Structure Optimization of Grid Frame Based on Generalized Slow Coherency Clustering	810
<i>Weiqiang Liang, Fei Tang, Mengqi Qing, Chufei Xiao, Wen Jian, Mengjiao Qing, Jiale Liu, Feifei Wang, Fusuo Liu</i>	
Fault Location of Distribution Network Based on Multi-method Fusion.....	815
<i>Yiwen Gao, Wenyue Zhou, Shilong Li, Huajie Zhang, Xiangxi Duan</i>	
Distribution Network Topology Error Identification Method Based on D-PMU and Branch State Function	821
<i>Yang Liu, Jinping Sun, Qifang Chen, Mingchao Xia</i>	
Analysis on AC Voltage Characteristic of UHVDC Converter Station and Dynamic Compensation	827
<i>Zheqian Jin, Qian Chen, Haoqing Xiong, Wenhai Zhou, Xiaolu Deng, Qi Zhang</i>	
Study on 24h Dynamic Reactive Power Optimization Considering Safety Operation Limit of Generators.....	832
<i>Bin Lu, Xi Xu, Zhipeng Yu, Wen Wang, Xuenan Gu</i>	
A Fault Pattern and Convolutional Neural Network Based Single-Phase Earth Fault Identification Method for Distribution Network	838
<i>Yajie Li, Yu Zhang, Wenjing Liu, Zhenning Chen, Yonghui Li, Jun Yang</i>	
Research and Development of Advanced Applications for Relay Protection Fault Information System Adaptable to Smart Dispatch.....	844
<i>Dongliang Nan, Hongshan Zhuang, Yuting Dong, Jie Wu, Yi Yang, Yonghui Sun</i>	

Study on Short-Term Load Forecasting Method Considering Meteorological Factors of Offshore Oilfield Group Microgrid	850
<i>Wenting Tan, Yating Feng, Yangfan Sun, Huang Huang, Siyuan Wang, Anan Zhang</i>	
A Novel Key-Value Based Real-Time Data Management Framework for Ship Integrated Power Cyber-Physical System	854
<i>Chengya Shang, Xianqiang Bao, Lijun Fu, Li Xia, Xinghua Xu, Chengcheng Xu</i>	
Linearization Error of Power Flow Model Considering the Distribution of State Variables	859
<i>Nan Feng, Zhifang Yang, Zhexin Fan, Juan Yu, Gaofeng Yang</i>	
Line Loss Association and Prediction Model Based on Deep Learning.....	865
<i>Daiyu Deng, Jian Li, Weihao Hu, Qi Huang, Shuwen Xu, Dechao Xu</i>	
The Coordinated Control of Thermostatically Controlled Loads and Energy Storage Considering the Lock-Out Effect	870
<i>Mingchao Xia, Yuguang Song, Qifang Chen</i>	
AGC Strategy for Distributed Energy Storage Aggregator Based on Consensus Algorithm	876
<i>Yibin Guan, Shengzhi Lu, Jun Teng, Zhenghua Chen, Bojun Kong, Jihui Zhang</i>	
A Novel Solar Irradiance Forecast Model Using Complex Network Analysis and Classification Modeling.....	882
<i>Kai Lv, Fei Wang, Jianfeng Che, Weiqing Wang, Zhao Zhen</i>	
Investment Optimization of Incremental Distribution Network Based on Cooperative Game in the Context of Investment Liberalization.....	888
<i>Xijun Ren, Bin Ye, Na Yang, Haiwen Shao, Ciwei Gao</i>	
Towards Ubiquitous Power Distribution Communication: Multi-service Access and QoS Guarantees for IoT Applications in Smart Grid.....	894
<i>Liming Chen, Xuzhu Dong, Xiaoyun Kuang, Baoren Chen, Danke Hong</i>	
Research on the Influence of Demand Response on the Life of Distribution Network Transformer	899
<i>JieFu Tian, Hui Ren, LiNing Hu, Fei Wang, HuiXin Feng</i>	
Enhancement of Power Equipment Management Using Knowledge Graph	905
<i>Yachen Tang, Tingting Liu, Guangyi Liu, Jie Liy, Renchang Dai, Chen Yuan</i>	
Ultra-Short Term Load Forecasting Based on Elman Neural Network.....	911
<i>Pengyu Di, Kai Dong, Jiang Du, Chao Dong, Xiangzhen He, Yuheng Guan, Haixiang Gao, Jiaming Li, Yanjie Liang</i>	
Influence of Generator-Tripping Time on Transient Stability.....	916
<i>Yusheng Xue, Xueqiong Zhu, Ze Li</i>	

Load Flow Analysis of 132/11 KV Grid Station Bahawalpur Region Pakistan and Its Voltage Improvement through FACTS Devices Using ETAP	922
<i>Abubakar Siddique, Yonghai Xu, Waseem Aslam, Muhammad Hanan, Adnan Azhar, Hafiz Mudassir Munir</i>	
Advanced Method for the Insertion Time of the Closing Resistor Based on the Pre-breakdown Characteristics.....	928
<i>Wei Wei, Ying Liu, Shengwei Mei, Fan Tang, Lijie Ding, Shumin Miao, Lun Tang</i>	
Optimal Active Power Control of AGC Considering High-Penetration EVs	934
<i>Kaiwen Zeng, Jianing Liu, Xiangzhen He, Xinlei Cai, Pengyu Di, Jiaming Li, Dezhi Wang, Lefeng Cheng, Tao Yu</i>	
Operating Overvoltage Simulation Research of ± 800 kV UHVDC Transmission Converter DC Yard Caused by Typical Grounding Fault	939
<i>Hao Zhang, Yapei Liu, Yujing Guo, Yongqi Yao, Zhijun Wang, Bo Zhang, Yingqian Du</i>	
Status Evaluation of Power Secondary Equipment Based on Big Data of Monitoring.....	944
<i>Xiangxi Duan, Shilin Feng, Yiwen Gao, Cheng Long, Rongsen Luo, Yongchao Sun</i>	
Influence of Nozzle Expansion Angle on the Breaking Performance of Ultra-High Voltage SF6 Circuit Breaker	950
<i>Hao Zhang, Yongqi Yao, Yujing Guo, Zhijun Wang, Bo Zhang, Yapei Liu, Yingqian Du</i>	
Study on Residual Flux Evaluation Method Based on Variable-Regional Integral during the Voltage Attenuation Process	954
<i>Wei Wei, Ying Liu, Shengwei Mei, Fan Tang, Lijie Ding, Lun Tang, Shumin Miao</i>	
Optimal Design of 535kV High Speed Mechanical Switch Pin Based on MAXWELL and LS-DYNA	960
<i>Zhigang Wang, Yapei Liu, Yongqi Yao, Hao Zhang, Zhijun Wang, Bo Zhang, Yingqian Du</i>	
Situational Awareness for Dynamic Power System Based on UKF-Driven Residual Matrix Analysis.....	964
<i>Ruiqiang Zhang, Jianguang Yin, Fei Peng, Guodong Qi, Quanquan Gong</i>	
Impact of Network Structure on Short-Term Voltage Stability Using Data-Driven Method	970
<i>Wanjuan Huang, Xinran Zhang, David J. Hill</i>	
Component Importance Indices of Transmission Systems Based on the Impact-Increment Based State Enumeration Method	976
<i>Yong Zhang, Bengang Wei, Zhaojie Liu, Tangyun Xu, Xiaonan Liu, Kai Hou</i>	
Optimal PMU Placement for the Distribution System Based on Genetic-Tabu Search Algorithm	980
<i>Quan Xu, Li Yu, Yuting Wang, Xiangyu Kong, Xiaoxiao Yuan</i>	
Efficiency Evaluation of Electric Power Industry Based on DEA Model	985
<i>Delv Zhu, Jing Shi, Jiaqi Xu, Kaihui Nan, Wang Zhang, Xiang Fang, Ying Xiao</i>	

Transmission Line Fault Identification Based on BP Neural Network	991
<i>Ran Kou, Yuhong Wang</i>	
Analysis of Voltage Stability Weak Nodes Location and Optimization Measures in DC Multi-infeed Receiving-end Power Grid	995
<i>Wenjia Zhang, Yi Ge, Wentao Sun, Quanquan Wang, Jing Shi, Daigang Liu</i>	
Research on Reconstruction Method of Multi-terminal Electromagnetic Loop Networks	1000
<i>Feng Zhang, Guixing Yang, Pengpeng Kang, Quanrui Hao, Guoteng Wang, Zheng Xu</i>	
On Optimization of Command-Delaying for Advanced Command Authentication in Smart Grid Systems	1006
<i>Daisuke Mashima, Ramkumar Rajendran, Toby Zhou, Binbin Chen, Biplab Sikdar</i>	
Research on Overspeed Protection Control Strategies of PWR Nuclear Power Units	1012
<i>Libin Wen, Wei Sheng, Zheng Xu</i>	
Tabulating Cybersecurity Solutions for Substations: Towards Pragmatic Design and Planning.....	1018
<i>Heng Chuan Tan, Carmen Cheh, Binbin Chen, Daisuke Mashima</i>	
Design of Information System Cyber Security Range Test System for Power Industry	1024
<i>Yongyuan He, Longchuan Yan, Jiaoli Liu, Dongxia Bai, Zhiyu Chen, Xuehao Yu, Dequan Gao, Jing Zhu</i>	
General Design Research of Intelligent Substation Equipment Interface Based on Modular Construction	1029
<i>Gaiping Shi, Jinsong Hu, Bin Chen, Yinzhong Wei, Xiangyu Kong, Jingtao Yao</i>	
Research on the Vibration Characteristics of GIS/GIL Bushbar.....	1034
<i>Zhijun Wang, Yujing Guo, Yongqi Yao, Yingqian Du, Hao Zhang, Yapei Liu, Bo Zhang</i>	
Research on Parameter Correction of Frequency Situation Estimation Model.....	1040
<i>Yanyang Fu, Jianbo Yi, Zhuohui Guo, Qi Huang, Yufei Teng</i>	
Fault Processing Algorithm of Power Backbone Communication Networks Based on Artificial Intelligence and State Perception.....	1045
<i>Weiwei Miao, Lei Wei, Haiyang Wu, Jian Shi</i>	
Comparative Analysis of External Characteristics of Nuclear Power Units and Thermal Power Units	1051
<i>Libin Wen, Wei Sheng, Zheng Xu</i>	
Distribution Network Topology Model Generation Method for Distributed Feeder Automation.....	1057
<i>Ran Chen, Jian Lu, Mingxiang Liu, Jun Ying, Yalou Chen, You Yue</i>	

Design Method for the Reinforcement Scheme of the Typical Regional Power Grid with High Proportion of Renewable Energy using VSC-HVDC Technology	1063
<i>Guangzeng You, Lingfang Li, Xinchun Zhu, Xinglong Wu, Liang Xiao, Jian Yang, Zheng Xu</i>	
Effect of Different Activation Function on Short Term Load Forecasting Using Neural Network—A Comparative Study	1069
<i>Rajni Kumari, Sachin Kumar Jain</i>	
Analysis on Impact of Baihetan Inverter Connection Modes on Stability of Zhejiang Power Grid.....	1075
<i>Guoteng Wang, Zheng Xu, Wen Hua</i>	
Application of Time Domain Dielectric Spectral Characteristics in Quantitative Evaluation of Oil-Paper Transformer Insulation Status	1080
<i>Yang Zou, Jin He, Jinding Cai, Mengqi Wang</i>	
Substation One-Line Diagram Automatic Generation and Visualization	1086
<i>Jing Hong, Yue Li, Yiran Xu, Chen Yuan, Hong Fan, Guangyi Liu, Renchang Dai</i>	
Application Research of Fiber Bragg Grating Sensing System in Condition Monitoring of Voltage Transformer	1092
<i>Fan Yang, Yan Gong, Yuqiang Fan, Qin Zhang, Xin Wang, Dou Wu, Huaihao We</i>	
Study on Voltage and Reactive Power Control of 10kV Direct Load Supply of 220kV Transformer Substation	1096
<i>Xue Gong, Yongdong Hua, Jiang Xie, Lei Tang, Xingli Li</i>	
A New Scheme of Substation Backup Protection Based on Topology Matrixes and Differential Zones.....	1102
<i>Yuxin Shi, Liang Wang, Huidong Guo, Da Lei, Qingmeng Meng</i>	
A Review on the Development of Concentrated Solar Power and Its Integration in Coal-Fired Power Plants.....	1106
<i>M. Jabbari Ghadi, Li Li, Jiangfeng Zhang, Luan Chen, Qi Huang, Changhai Li</i>	
The Application of Latent Feature Model in Power Equipment Evaluation.....	1112
<i>Yuqiang Fan, Ke Xu, Yaoran Huo, Yu Zeng, Huaihao Wei, Qin Zhang, Xin Wang, Jiazhou Li</i>	
Wide-Band Phasor Measurement Unit: Design and Test.....	1116
<i>Chen Wu, Jie Sheng, Ronghua Duan, Xiaorong Xie, Zhixue Li</i>	
Optimization of Entering Path for Equipotential Live Work on ± 800 kV UHV DC Line.....	1121
<i>Yadi Zhang, Wencheng Sun, Ke Yang, Zehua Huang, Yuanjie Jiang</i>	
Study on a Novel Fully Automatic Transformer Calibrator Overall Test Device	1127
<i>Na He, Kun Liu, Hao Wang, Gang Liu, Xianshun Chen, Ruihan Wang</i>	

Optimization of Artificial Bee Colony Algorithm Based Load Balancing in Smart Grid Cloud.....	1131
<i>Luocheng Shen, Jiazhou Li, Yan Wu, Zhenyu Tang, Yi Wang</i>	
The Application of Equipment Overheating and Arcing Fault Warning and Protection Systems of Switchgear in Power Systems	1135
<i>Qiang Wang, Peng Qiu</i>	
Active Distribution Network Planning Method under Power-User Interaction Mode	1138
<i>Xibin Yang, Shilong Wang, Shuangshang Song, Zhijun Ren, Minhua Guo, Hongxia Guo, Ping Yang</i>	
A Novel Fuzzy Evidential Reasoning Method Combining Entropy Weight for Power Grid Emergency Capability Evaluation with Uncertainty	1143
<i>Zeyuan Yu, Zhewen Niu, Xia Chen, Wenhui Tang</i>	
Internal State Estimation for Distribution Network with PMU Measurement Information	1149
<i>Li Yu, Xiangyu Kong, Ying Chen</i>	
The Full Frequency-Domain Transient Recorder and the Analysis System	1154
<i>Xaunwei Qi, Chengyu Lu, Song Wang, Liexiang Hu, Yutao Qiu, Baoxing Shen</i>	
Power System Transient Stability Assessment Method Based on CapsNet	1159
<i>Xu Tian, Jun An, Gang Mu</i>	
Active-Adaptive Control System of the Thyristor Voltage Regulator	1165
<i>Elena Sosnina, Rustam Bedretdinov, Evgeny Kryukov, Andrey Smirnov</i>	
Clustering Algorithm Based Battery Energy Storage Performance Analysis Method	1170
<i>Zhang Tianjiao, Tang Xisheng, Kong Li</i>	
Visual Power Line Inspection via Multi-direction Transform	1176
<i>Tianliang Peng, Zhiyu Chen, Shaoyan Gong, Xiaolin Liu, Longchuan Yan, Jing Zhu, Dong Wang</i>	
Power System Text Information Matching Research Based on Deep Learning	1181
<i>Wei Bao, Chengyu Lu, Huafeng Luo, Xiaohua Xuan, Lixiang Ruan</i>	
Simulation Modeling of High Impedance Transformer Based on PSCAD with Deep Correlation of Winding Structure	1187
<i>Yuanlin Pan, Xianggen Yin, Wenbin Cao, Yongxin Chen, Xiangyuan Yin, Yuxue Wang, Qian Guo</i>	
Time Difference Method to Calculate the Optimal Differential Point of Half-Wavelength AC Transmission Line Differential Protection	1193
<i>Yarong Guo, Zexin Zhou, Xingguo Wang, Huanzhang Liu</i>	

Developing a Decision Support System for the Optimal Operating Strategies of a Polygeneration Facility.....	1199
<i>Maximiliano Lainfiesta, Xuewei Zhang, Jinjie Wu, Huihui Song</i>	
An Ensemble Wavelet Deep Learning Approach for Short-Term Load Forecasting.....	1205
<i>Zhiwei Song, Zhaojing Cao, Can Wan, Shenglan Xu</i>	
Frequency Regulation Energy Storage Utility Evaluation Based on Different Power Supply Structures	1211
<i>Hao Chen, Yong Sheng, Yanbing Jia, Jin Zheng, Tianhao Song, Gang Luo, Dong Xie</i>	
Docker-Based Simulation Training System on Dispatching and Control Cloud.....	1216
<i>Qun Ma, Jiabing Han, Zhengqing Xu, Xuanhuai Yang, Qunshan Li</i>	
The Application of Non-invasive Sensor in Unbalanced Three-Phase Current Detecting	1221
<i>Ke Zuo, Guangchao Geng, Quanyuan Jiang</i>	
Analysis on Oscillation Propagation Characteristics Based on Impedance Model	1226
<i>Yan Gong, Qi Huang, Jian Li, Dongsheng Cai</i>	
Poisoning Attack on Load Forecasting	1230
<i>Yi Liang, Di He, Deming Chen</i>	
Fast State Estimation of Power System Based on Extreme Learning Machine Pseudo-Measurement Modeling	1236
<i>Yubin Wang, Mingchao Xia, Qifang Chen, Fangjian Chen, Xiaonan Yang, Feng Han</i>	
◆ Renewable Generation and Distributed Energy Resources Integration	
Impact of FRT Control Strategies of Photovoltaic Power Generation System on Short-Term Dynamic Voltage Response	1242
<i>Gelma Boneya Huka, Pupu Chao, Weixing Li</i>	
Probabilistic Small Signal Stability Assessment of Large-Scale Wind Power Integration.....	1248
<i>Ping He, Jie Chen, Xinxin Wu, Pan Qi, Runjie Shen, Wei Yin</i>	
Simplified Modeling of Directly Driven Wind Turbine with Permanent Magnet Synchronous Generator Based on PSASP/UD.....	1254
<i>Kang Ju, Feng Wu, Linjun Shi, Hongyang Huang, Wen Hua, Weiguo He, Guanghui Hua</i>	
Fault Analysis for Three Phase Unbalanced Distribution Network with Photovoltaic Generation Integration	1260
<i>Huan Li, Ke Peng, XinHui Zhang, ShunQi Zeng, JunGe Li</i>	
Combined Tree Growth Algorithm for Optimal Location and Size of Multiple DGs with Different Types in Distribution Systems	1265
<i>Mansur Khasanov, Kaigui Xie, Salah Kamel, Lili Wen, Xuan Fan</i>	

Optimal Siting and Sizing of Energy Storage System in Distribution Grid Considering Power Supply Reliability	1271
<i>Yingtu Mao, Di Qiu, Dong Liu, Yikai Sun</i>	
Capacitor Allocation in Distribution Systems Using Fuzzy Loss Sensitivity Factor with Sine Cosine Algorithm.....	1276
<i>Salah Kamel, Ali Selim, Francisco Jurado, Juan Yu, Kaigui Xie, Tao Wu</i>	
Feasibility Study to Install a 1 MW Grid Connected Solar Plant in Wairoa-Mahia Peninsular, New Zealand	1282
<i>A. Garae Liu, T. T. Lie</i>	
Assessment Integration of Wind-based DG and DSTATCOM in Egyptian Distribution Grid Considering Load Demand Uncertainty	1288
<i>Salah Kamel, Ashraf Ramadan, Mohamed Ebeed, Juan Yu, Kaigui Xie, Tao Wu</i>	
Different Impacts of Positive Error and Negative Error of Wind Power Forecasting on Power System Economical Operation.....	1294
<i>Yu Chen, Chang Kang, Yanfang Zhu, Yanhong Ma, Xiuli Zhang, Xiaohu Yang</i>	
Allocation of Distributed Generation in Radial Distribution Networks Using an Efficient Hybrid Optimization Algorithm	1300
<i>Mansur Khasanov, Salah Kamel, Kaigui Xie, Ping Zhou, Bo Li</i>	
Designs and Applications for the Controller Parameters of the Photovoltaic System	1306
<i>Bo Wang, Han-juan Shen, Shao-zhen Chen, Dong Wang, Ke Yang</i>	
Multi-objective Whale Optimization Algorithm for Optimal Integration of Multiple DGs into Distribution Systems	1312
<i>Salah Kamel, Ali Selim, Francisco Jurado, Juan Yu, Kaigui Xie, Changqing Yu</i>	
A Novel Sliding Mode Control of Doubly-Fed Induction Generator for Optimal Power Extraction.....	1318
<i>Qingmei Kong, Xiangdong Wang, Shujiang Li</i>	
Control Strategy Analysis of Grid-Connected Energy Storage Converter Based on Harmonic Decomposition	1324
<i>Yonggan Xu, Jian Luo, Kunming Tang, Jie Jiang, Xin Gou, Jiawei Shi, Bingwen Lu</i>	
Volt/VAR Control with DERs, LTCs, and Switched Capacitors: Case Study with a Commercial Distribution System.....	1330
<i>Ling Jiang, Keyue M. Smedley</i>	
Solving Optimal Reactive Power Dispatch Problem Considering Load Uncertainty	1335
<i>Salah Kamel, Said Abdel-Fatah, Mohamed Ebeed, Juan Yu, Kaigui Xie, Chenyu Zhao</i>	
Peaking Compensation Mechanism for Supply and Demand Sides Union Promoting Wind Power Integration.....	1341
<i>Jianfeng Sha, Hao Liu, Huifeng Dong, Tianliang Wang, Xin Jiang</i>	
A Multi Objective Framework for Optimal Installation of Distributed Generator Units Using Genetic Algorithm.....	1347
<i>N. Arputha Aravinth, Vikas Anand Vatul, Narayanan K</i>	

DERs Sizing of Hybrid Microgrid by Hierarchic Optimization Strategy.....	1352
<i>Kai Kang, Yunlong Zhang, Hui Li, Zixun Cao, Hongkun Chen</i>	
Stochastic Planning Model for Incremental Distribution Network Considering CVaR and Wind Power Penetration ..	1358
<i>Xijun Ren, Na Yang, Bin Ye, Yunting Yao, Ciwei Gao</i>	
Renewable Energy-Based Micro-Grid; a Zero-Emission Option for Electricity Production in Australia.....	1364
<i>Ahmad Zahedi</i>	
Distributed Generation Low-Carbon Trading Strategy Based on Cooperative Game Nucleolus Method	1369
<i>Saite Yang, Qian Chen, Jie Yu, Jian Geng, Hongwei Du, Zheqian Jin, Wei Zeng</i>	
A Peer-to-Peer Market Mechanism for Distributed Energy Resources.....	1375
<i>Wei Zhang, Xiuli Wang, Yongxi Huang, Shixiong Qi, Ziyi Zhao, Fen Lin</i>	
SOC-Based Hybrid Energy Storage System Dynamical and Coordinated Control for Vessel DC Microgrid.....	1381
<i>Hao Li, Lijun Fu, Yan Zhang, Xueping Gao, Yunfeng Lin</i>	
Model Predictive Control based Load Frequency Control for Power Systems with Wind Turbine Generators.....	1387
<i>Xiaofei Sun, Kai Liao, Jianwei Yang, Zhengyou He</i>	
The Characteristics and Challenge on Large-Scale Renewable Energy Grid Integration.....	1393
<i>Yongning Chi, Yan Li, Zhen Wang, Zhen Li, Hongzhi Liu, Zhankui Zhang</i>	
Online Identification Strategy of Synchronous Generator Based on Laplacian Eigenmap Algorithm for Wind Power System.....	1399
<i>Huazhi Chen, Yang Liu, Fei Tang, Chufei Xiao, Weiqiang Liang, Mengqi Qing, Fang Zhou</i>	
The Research of Sub-synchronous Oscillation in DFIG Wind Farm under Weak AC Grid	1404
<i>Caihong Dong, Peng Zhang, Yang Bai, Jiixin Hu, Tianshu Bi</i>	
Probabilistic Assessment of Distribution Network with High Penetration of Distribution Generations	1409
<i>Xiongguang Zhao, Feifei Wang, Chenxu Wang, Fei Tang, Dichen Liu, Mengqi Qing, Mengjiao Qing</i>	
Reactive Power and Voltage Coordinated Control of Wind Farm for Parallel Running STATCOM	1414
<i>Lufei Xu, Tianhua Chen, Luo Yang, Jianhua Chen, Lei Du, Hailiang Zhong</i>	
Fault Model of Inverter Interfaced Distributed Generator Adopting PQ Control Strategy Considering Current Tracking Capability of Converter	1419
<i>Chuanzhi Wei, Xiaohan Shi, Boxi Zhou, Yang Liu</i>	
Short-Term Load Forecasting Based on Elman Neural Network Optimized by Firefly Algorithm.....	1425
<i>Haitao Liu, Xiao Sun, Lun Xu, Si Gu, Fang Sun</i>	
The Application of M3C Based on Optimized Sorting in Fractional Frequency Transmission System	1430
<i>Wenhao Wang, Mingdong Wang</i>	

Inertial Response of Doubly-Fed Induction Generator with the Phase-Locked Loop	1435
<i>Mengqi Qing, Fei Tang, Dichen Liu, Mengjiao Qing, Weiqiang Liang, Wen Jian, Chufei Xiao, Fusuo Liu</i>	
Study of the Hierarchical Control System for DC Micro-grid	1440
<i>Lili Yu, Zhaoyun Zhang, Wei Wang, Yitao Liu</i>	
Critical Bus Voltage Support in Islanded Microgrids with Consensus Algorithm of Distributed Generators	1445
<i>Ernauli Aprilia, Wang Zhang, Ke Meng, Zhao Yang Dong</i>	
Robust Voltage Security Regions with VSC-HVDC Connections	1450
<i>Tao Niu, Feng Jiang, Qinglai Guo, Zheng Wang, Huaichang Ge, Hongyang Jin, Bin Wang</i>	
Optimal Allocation of Distributed Generation Based on Multi-objective Ant Lion Algorithm	1455
<i>Haitao Liu, Lun Xu, Chao Zhang, Xiao Sun, Jing Chen</i>	
Optimal Operation of Distribution Network with Distributed Wind Power Efficient Consumption Accounting for Demand Response	1461
<i>Jiandong Duan, Qian Sun, Wenchao Lu, Yulin Cheng</i>	
Single-Stage Grid-Connected Photovoltaic Generation Takes Part in Grid Frequency Regulation for Electromechanical Transient Analysis	1467
<i>Gangui Yan, Wenbo Hu, Qi Jia, Shanfeng Zhang</i>	
Fixed Change-Rate Matrix Correction Algorithm for Processing PV Nodes in Active Distribution Network Power Flow Calculation	1473
<i>Fei Chang, Qian Zhu, Shuai Hu, Zhanwang Li, Zhendong Zang, Rui Wang</i>	
Energy Management Optimization Strategy of User Side in Smart Grid Based on Model Predictive Control	1479
<i>Ting Zhang, Yueping Xiang, Jianwei Yang, Tianlei Zang</i>	
Research on Control Strategy of Improved Virtual Synchronous Generator for Improving the Operating Capability of Passive Isolated Islands	1485
<i>Yuhong Wang, Lan Luo, Tianze Li, Yong Chen, Yuntao Fu</i>	
Integrated Decision Making of Distribution Network Planning Schemes Based on EW-GRA Algorithm Combined with P-OWA Operator	1491
<i>Yanxun Qi, Ruanming Huang, Han Wu, Qing Xie, Dong Peng</i>	
A Corrective Control Approach for Combined Heat and Power System integrated with Multiple Energy Storage System	1497
<i>Qunli Lin, Xinwei Shen, Yong Sun, Zhenyuan Li, Qinglai Guo, Hongbin Sun</i>	
Research on Comprehensive Assessment System of Park Integrated Energy System	1503
<i>Junfeng Liu, Kai Yuan, Yin Xu, Yi Song, Chongbo Sun, Xianing Jin, Danlei Hu</i>	

DE Algorithm Based Double-Layer Frame of Power Flow Calculation for Loop Distribution Networks	1509
<i>Yulu Zhou, Yalin Chen, Jingrui Zhang</i>	
Coordinated Optimal Configuration Method of Hybrid Energy Storage Systems in Energy Internet System	1515
<i>Tianmeng Yang, Zhentao Han, Fangyuan Yang, Yi Liang, Jing Gao, Xing Ji</i>	
Chance-Constrained Shrunken-Primal-Dual Subgradient (CC-SPDS) Approach for Decentralized Electric Vehicle Charging Control	1520
<i>Mingxi Liu, Mostafa Sahraei-Ardakani</i>	
Uncertainty Analysis of Wind Power Fluctuations in Yunnan Power Grid	1526
<i>Pingping Xie, Jizhong Zhu, Jin Zou, Peizheng Xuan</i>	
Optimal Scheduling Method for Electrical-Thermal Integrated Energy System Considering Heat Storage Characteristics of Heating Network.....	1531
<i>Bo Zhao, Xuesong Zhang, Chouwei Ni, Yunfei Mu, Mingjun Wang, Xianjun Meng</i>	
Reactive Power Optimization of Power Grid with Photovoltaic Generation Based on Improved Particle Swarm Optimization	1536
<i>Huibo Liu, Guoying Huang, Chun Wang, Haixuan Liu, Zizhao Wang, Ziwei Xu, Linjun Shi</i>	
Stability Analysis and Compensator Design for PV Generators Based on Describing Function Method.....	1541
<i>Jianing Liu, Yanghong Xia, Miao Yu, Wei Wei</i>	
Chance-Constrained DG Hosting Capacity Assessment with Spatially Correlated Wind Speed	1546
<i>Han Wu, Ruanming Huang, Yuefeng Wang, Yue Yuan</i>	
A MILP Production Costing Method Realizing Environmental Benefits of Wind Power	1552
<i>Jiao Du, Yueyue Li, Shunbo Lei, Yujia Li, Yunhe Hou</i>	
Comprehensive Performance Evaluation and Research of RE-CCHP System	1558
<i>Jiahui Wu, Saniye-Maihemuti, Weiqing Wang, Haiyun Wang</i>	
Research and Application of Rapid Frequency Response Technology for New Energy Power Station.....	1564
<i>Guanghui Hua, Ruwei Hu, Weiguo He, Ailiang Kong, Shuo Liang</i>	
Comparative Study of EKF and UKF for SOC Estimation of Lithium-ion Batteries	1570
<i>Tian Xiao, Xiaohan Shi, Boxi Zhou, Xiaolei Wang</i>	
Macro-level Evaluation of Distribution Network Operational Risks Caused by Distributed Generation	1576
<i>Bibin Huang, Jing Hu, Bowen Hong, Hu Yan, Kaihui Feng</i>	
An Optimal Three-Phase Power Control Method of Distribution Network Based on Split-Phase SNOPs	1580
<i>Chao Lei, Chanxiao Li, Qianggang Wang, Jian Wang, Niancheng Zhou</i>	

Impact of Frequency-Responsive Wind Turbines on Power System Stability	1589
<i>Li Sun, Yanfeng Ge, Dong Wang, Yunhe Hou</i>	
Optimized Operating Strategy for a Distribution Network Containing BESS and Renewable Energy	1593
<i>Ke Qing, Qi Huang, Shuheng Chen, Weihao Hu, Jun Wang</i>	
Dynamic Pricing for Microgrids Energy Transaction in Blockchain-Based Ecosystem.....	1598
<i>Jingpeng Yue, Zhijian Hu, Chendan Li, Amjad Anvari Moghaddam, Josep M. Guerrero, Jeremy Dulout</i>	
Switch Optimal Planning in Distribution Networks Based on Dynamic Programming	1603
<i>Tao Wei, Jian Su, Xuan Zhang, Jiming Ma, Zhiyan Yu, Wenjie Hong</i>	
Voltage Unbalance Mechanism Research with Largescale Wind Power Integration.....	1608
<i>Can Chen, Hui Liu, Linlin Wu, Yuntao Ju</i>	
The Role of Pumped Hydro Storage in Supporting Modern Power Systems: A Review of the Practices in China	1613
<i>Yong Sun, Min Wei, Lei Wang, Wei Xu, Jie Sheng, Xiaorong Xie, Hao Nan</i>	
Frequency Control Strategy of Grid-Connected PV System Using Virtual Synchronous Generator	1618
<i>Wenfeng Li, Hui Wang, Yuan Jia, Suxiang Yang, Haoming Liu</i>	
Impact of Voltage Close Loop Control on Small Signal Stability of Virtual Synchronous Generators	1623
<i>Dawei Sun, Hui Liu, Peng Song, Xiaosheng Wang, Yu Gong, Xuekun Cheng, Junjie Wang</i>	
Integrated Operation Mode of Grid-Connected Microgrid Considering Double-Layer Demand Response	1628
<i>Huimin Wang, Ping Yang, Rui Gao, Zhijun Ren</i>	
Research on Reactive Power and Voltage Coordination Control Strategy for Multi-wind Farm Connecting to Power Grid	1633
<i>Bowen Liu, Xinyan Zhang, Deqian Kong, Xiaoyan Liu, Xiqiang Chang</i>	
Coordinated Primary Frequency Control for Virtual Power Plant Based on Distributed Subgradient-Projection Method	1638
<i>Yin-guo Yang, Qiu-yu Lu, Shuang-xi Wu, Zhongguan Wang, Tian Xia</i>	
Collaborative Control of Integrated Generation and Storage for Offshore Wind Turbines	1644
<i>Xiao-Peng Ji, Zhao Liu, Weiwei Liu, Xinyu Zhang</i>	
Analysis and Inspiration of the National Load all Powered by Renewable Energy in Portugal.....	1650
<i>Wei Yang, Rui Pestana, Joao Esteves, Francisco Reis, Yan Li, Yongning Chi, Xinshou Tang, Haiyan Tang</i>	
Robust Reconfiguration of Distribution Network Considering the Access of Photovoltaic Electric Vehicle Charging Tower	1655
<i>Peifeng Shen, Qiang Liu, Guofeng Liu, Xuyan Wang, Haoliang Zhang, Jun Jiang</i>	

Capacity Assessment of VAR Compensation in Distribution Network Using Multi-parametric Programming.....	1659
<i>Zhenyi Wang, Chuan Zhao, Ronghua Duan, Tian Xia</i>	
Frequency Regulation Strategy for DFIG Combining Over-speed Control and Adaptive Virtual Inertia.....	1663
<i>Huanjing Lao, Li Zhang, Tong Zhao, Liang Zou</i>	
Imprecise Reliability of Lifetime Data Based on Threeparameter Generalized Inverse Weibull Distribution	1667
<i>Changhai Li, Yunlong Teng, Lulu An, Qiuge Dan</i>	
Active Power Control Strategy of Wind Power Outgoing Channel Considering Multiple Constraints and Target Limit	1671
<i>Jianbo Wang, Chen Wang, Yufei Rao, Chenghao Li, Yang Liu, Zhou Fang, Wei Cui, Weijun Teng</i>	
Dynamic Equivalence Method of Wind Farm Considering the Wind Power Forecast Uncertainty.....	1677
<i>Longyuan Li, Xiaoru Wang, Qingyue Chen, Yufei Teng</i>	
Research on the Impact of Wind Power Integration on Power System Voltage Stability	1683
<i>Yinqiao Wang, Zhimin Li, Fang Lu</i>	
An Interoperable Building Energy Management System with IEEE1888 Open Protocol for Peak-Load Shaving.....	1688
<i>Phanumat Saatwong, Surapong Suwankawin</i>	
Typical Voltage Quality Optimization Strategy for Distribution Network	1694
<i>Shengkai Wang, Jiandong Jiang, Yisheng Fang, Yuanbo Dang</i>	
Cost-Benefit Analysis of PV Penetration and its Impact on the Frequency Stability: Case Study of the South-Central Kalimantan System.....	1700
<i>Tatok Winarko, Nanang Hariyanto, Fathin Saifur Rahman, Masayuki Watanabe</i>	
Research and Application of Distributed Storage Technology in Power Grid Enterprise Database.....	1706
<i>Yan Gong, Yan Wu, Kejia Pan, Jian Chang, Jia Xu</i>	
Multi-objective Optimal Strategy for the Coordination Control between Distributed Energy Storage System and Flexible Load	1711
<i>Juntao Fei, Xiaodong Yuan, Mingming Shi, Qingqiang Xu, Yuhua Xiao</i>	
Distributionally Robust Generation Expansion Planning Model Considering RES Integrations.....	1716
<i>Xuejiao Han, Gabriela Hug</i>	
A New Form of User Power Supply System Promoted by Distributed Electric Resources.....	1722
<i>Xiangqian Tong, Minghang Zhong, Qiao Ma, Xiaoyun Sun</i>	
Grid Integration and Demand Response Management of Geothermal Power Plant with Hybrid Energy Storage System in Indonesia	1727
<i>Ardila Johan Erdiansyah, Xibeng Zhang, Abhisek Ukil</i>	

Optimal Planning Model for Integrated District Energy Systems Considering Electricity and Gas Distribution Networks	1733
<i>Ke Sun, Weibin Yin, Chun Li, Yanan Wang, Chengcheng Shao</i>	
Active Distribution Network Energy Management with Cooperative Scheduling of Multi-microgrids.....	1739
<i>Lining Hu, Zhihui Dai, Shuqiang Zhao, Jiefu Tian, Bingyan Chen</i>	
Capacity Determination of the DC-side Battery for Hybrid Batteries in PV Generation System	1745
<i>Shinya Hashimoto, Toshikazu Yamamoto, Koichi Nara, Nozomi Tobaru</i>	
Optimized Capacity Configuration of Photovoltaic Generation and Energy Storage for Residential Microgrid	1751
<i>Yongqiang Zhu, Quan Zhang, Kang Liu, Minxiao Han, Qing Chen, Yang Liu</i>	
The System of Implementation Effect Evaluation for Distribution Network Planning and Design Standard.....	1756
<i>Yuqing He, Yifei Wang, Cong Liu, Chongbo Sun, Weihong Yang, Shigong Jiang, Can Cui</i>	
A Converter Control Strategy Based on Droop Control in Distributed Generation Systems.....	1762
<i>Dezhou Liu, Siyang Fan</i>	
Node Net Load Forecasting of Distributed Photovoltaic Considering Different User Characteristics	1766
<i>Mengmeng Cao, Linjun Shi, Zizhao Wang, Ladier Fa, Weiyuan Wang, Fei Dou, Junhui Huang, Quanquan Wang</i>	
Optimal Capacity Allocation of Renewable Energy Generation Base for Small Signal Stability Improvement.....	1772
<i>Huiyu Liang, Huanhai Xin, Di Wu, Hui Yuan, Chengzhi Zhu</i>	
Wind Energy Conversion Systems and Artificial Neural Networks: Role and Applications.....	1777
<i>Jaber Alshehri, Ahmed Alzahrani, Muhammad Khalid</i>	
Available Inertia Estimation of Induction Machine and Its Effect on Frequency Response of Power Systems with Wind Penetration	1783
<i>Ding Wang, Xiaoming Yuan, Yangwu Shen, Ting Cui, Zhen Hu, Wei Cao, Long Li</i>	
Analysis of Aggregated Wind Power Dependence Based on Optimal Vine Copula	1788
<i>Xu Yundai, Yuan Yue</i>	
Optimal Locating and Sizing the Energy Storage System Considering the Reconfigurability of the High Voltage Distribution Network in Urban Grids.....	1793
<i>Xizhang, Youbo liu, Xinran Yang, Fangfang Liu, Chengzhi Zhu, Yiyang Yao</i>	
Energy Management Strategy of Smart Residential Community Considering Aggregated Air-Conditioning Loads	1798
<i>Shuifu Gu, Kejun Qian, Jie Li, Jie Song, Hongwei Shen</i>	
Battery Cell Temperature Estimation Model and Cost Analysis of a Grid-Connected PV-BESS Plant	1804
<i>Md Mehedi Hasan, S. Ali Pourmousavi</i>	

A Distribution Network Economic Dispatch Based on Network Reconfiguration and Electric-Heat Combined Demand Response.....	1810
<i>Yue Guo, Juan Zhao, Shiyuan Ni, Xiangyu Kong</i>	
Generation Scheduling Optimization of Wind-Storage Combined Generation System Based on Combined Empirical Mode Decomposition (CEMD)	1816
<i>Jie Shi, Xiaofei Liu, Xingong Cheng, Xiju Zong</i>	
DC Bus Voltage Regulation for Distributed Energy Sources through Buck-Boost Converter in a Direct Current Micro Grid	1822
<i>Asif Raza Solangi, Qi Huang, Ghalib Raza, Muneer Abbas, Siraj Hyder Solangi</i>	
Optimal Allocation of Photovoltaic in the Hybrid Power System Using Knapsack Dynamic Programming	1828
<i>Anindita Satria Surya, Philipp Awater, Musa Partahi Marbun, Nanang Hariyanto</i>	
Optimal Dispatch Model of Wind Power Accommodation in Combined Heat and Power System Based on Unit Commitment.....	1834
<i>Chaofan Hu, Zhiqiang Luo, Shengyu Zhou, Huabao Xie, Linxian Hu</i>	
Multiobjective Sizing Optimization for Combined Heat and Power Microgrids Using a Triangular Evaluation Model and the Self-Adaptive Genetic Algorithm	1840
<i>Jianyong Zhao, Heng Nian, Liang Kong</i>	
Research on Estimation of Regional Distributed Photovoltaic Output Based on K-medoids Algorithm	1846
<i>Wu Ji, Cheng Xu, Zhu Xiang, Zhou Hai, Cui Fang</i>	
Effect of Temporary DC Fault of FB-MMC-HVDC on Offshore Wind Farm Based on DFIGs	1851
<i>X. Chen, Z. Y. Yu, W. H. Tang</i>	
Multi-objective Optimal DG Sizing and Placement in Distribution Systems Using Particle Swarm Optimization	1857
<i>Yahaya Abass, Mohammad Abido, Mohammad Al-Muhaini, Muhammad Khalid</i>	
A Planning Method of Distributed Generations for Promoting Renewable Energy Utilization in the Coupled Network	1862
<i>Huifang Yao, Yong Li, Xia Shao, Xuebo Qiao, Yu Zhang</i>	
Optimal Dispatching Strategy for Active Distribution System Considering Network Reconfiguration	1868
<i>Zhiyong Yuan, Xiangyu Kong, Chengsi Yong</i>	
Research on Improving the Operation Stability of Wind Farms Connected to Power Grid by Using VSC-HVDC Containing SMES	1873
<i>Ziwei Tan, Yujia Zhai, Feng Wang</i>	
Reliability Assessment of Standalone Wind-Based Energy Storage System Using Monte Carlo Simulation	1878
<i>Nemer Amleh, Mohammad AlMuhaini, Muhammad Khalid</i>	

Hierarchical and Divisional Optimal Dispatching Strategy for Active Distribution Network Based on Hybrid Particle Swarm Optimization	1883
<i>Zhao Jian, Zhou Ning, Wang Lei, Liu Hao, Sun Qian</i>	
Dynamic Conductor Temperature Modelling and Analysis of a Distribution Network with PV	1889
<i>Arif Ahmed, Fiona Stevens McFadden, Ramesh Rayudu, Tobias Massier</i>	
Impact of Large Scale Wind Power with DFIG on Small Signal Stability of the System.....	1895
<i>Xiaoyi Xu, Ning Chen, Shuangqiu Qian, Hualing Han, Dawei Zhao</i>	
An Optimization Method Based on Time-Sharing Energy Complementation to Determine Transmission Capacity of Wind-CSP Plants Combined System.....	1901
<i>Yang Cui, Huiquan Zhang, Siyu Huang, Boyang Xu</i>	
An Integrated Operation Strategy of Energy Storage System in ADN Planning	1907
<i>Yunfei Zheng, Yingxiang Wang, Jiong Yan, Chenying Yi, Weiwei Lin, Yue Ning, Zhi Chen, Zhijian Hu</i>	
Coordinated Optimal Planning of Generation and Storage in Hybrid AC/DC Micro-grid	1913
<i>Liang Ge, Chaoran Fu, Mingming Wu, Yutong Wang, Linkun Man</i>	
Voltage Control Partitioning of Wind Power Integration System Based on Pilot-Bus Control Space	1919
<i>Wei Cui, Yufei Rao, Chenghao Li, Yang Liu, Pengling Ren, Ze Gao, Hua Wang</i>	
Research on Adjustment and Utilization Strategy of Transformer in Distribution Network Based on Safety Efficiency Cost	1924
<i>Chao Xing, Xinze Xi, Mingqun Liu, Shengnan Li</i>	
State-Evaluation & Risk-Assessment Based Maintenance Resource Allocation Method for Distribution Networks ...	1930
<i>Linbo Wang, Fengsheng Yang, Zhirui Wang, Yuanfeng Wang, Xi Zeng, Mian Wang</i>	
Real-Time Dispatch of Flexible Ramping Products for Energy Storage and Demand Response	1936
<i>Yuzhou Zhao</i>	
Review on Modeling of Photovoltaic Power Generation Systems.....	1942
<i>Dawei Zhao, Luming Ge, Minhui Qian, Dajun Jiang, Linan Qu, Hualing Han, Yanzhang Liu, Xudong Wang</i>	
An Overview of Planning Technology for Active Distribution Network	1947
<i>Rongjian Cui, Hui Hou, Xiangtian Deng, Tao Xu, Peng Liu, Zhenfeng Xiao, Peizhe Xin</i>	
Flexible Coordinated Planning of Electricity-Gas Integrated Distribution System Considering Demand Side Management	1952
<i>Huiru Wang, Weihao Liao, Jianlian Zhang, Chuangxin Guo</i>	
Review on Modeling of Wind Power Generation Systems	1958
<i>Minhui Qian, Dawei Zhao, Fubao Wu, Lingzhi Zhu, Ning Chen, Haifeng Li, Ningyu Zhang</i>	

Reliability Improvement in Radial Distribution System through Reconfiguration	1963
<i>Srividhya Pattabiraman, Kirithikaa Sampath, Mounika Kannan, Girish Ganesan R, Narayanan K</i>	
Stability Analysis of N-Paralleled Photovoltaic Grid-Connected DC Systems.....	1968
<i>Yue Li, Yonggang Peng</i>	
Operational Optimization of Wind Farm Integrated Battery/Electrolyzer in Electricity Market Considering Fluctuation Penalty	1973
<i>Xiao Xu, Weihao Hu, Di Cao, Qi Huang, Zhe Chen</i>	
A Value-of-Service Based Model for Resilient Distribution System Restoration with Microgrids	1979
<i>Zhigang Ye, Kai Wu, Zihang Zhang, Bo Chen, Chen Chen</i>	
Optimized Planning of P2G Plant in Integrated Electricity and Natural Gas System	1984
<i>Kaige Hu, Jian Li, Xiao Xu, Weihao Hu, Qi Huang, Shuwen Xu, Dechao Xu, Zhe Chen</i>	
✦ Power Electronics and Control and Protection systems for Smart Grids	
Research on Feeder Interconnect Flexible Multi-state Switch	1990
<i>Menghan Su, Qunhai Huo, Wei Tongzhen, Guo Xinming</i>	
Simulation Implementation of Embedded Protection Control Platform	1995
<i>Bi Xiang Dai</i>	
A Strategy for Suppressing the Second Harmonic of Output Power for Photovoltaic Grid-Connected Inverters with Low Voltage Ride-through.....	1999
<i>Haitao Yang, Huifen Zhang, Xijing Wang</i>	
Fault Detection of High Voltage Circuit Breaker Based on Moving Window Variational Mode Decomposition and Fuzzy Entropy	2005
<i>Junxiang Liu, Le Luan, Hongbin Wang, Heping Peng, Haijing Wang</i>	
Simulation of Electrical Stresses on DC Cable system in a ± 800 kV LCC-UHVDC Transmission System	2010
<i>Haitian Wang, Mingyu Zhou, Qikai Zhuang, Ruoyu Xu, Xianzhang Lei</i>	
Research on Virtual Synchronous Generator Control Strategy Based on the Battery State of Charge.....	2016
<i>Jialin Peng, Jianhui Meng, Yi Wang, Meiqi Song</i>	
The Contrastive Analysis of Control of Microgrid Inverter	2021
<i>Yaru Xu, Xiaoning Xu, Xiaonan Yang, Feng Han, Xuhan Wu, Yiping Yu</i>	
Simulation Study on the Transient Characteristics of HVDC Voltage Divider and Their Effects on Undervoltage Sensing Protection	2027
<i>Yufei Teng, Xiaopeng Li, Jie Wu, Mingzhong Liu</i>	

Research and Demonstration Application of On-line Monitoring and Evaluation Technology for Primary Frequency Regulation in Renewable Energy Power Station	2032
<i>Dong Liu, Bo Wang, Xin Shan, TingXiang Lu, XiaoBo Ling, ZhenNing Tan, JingKai Zhu, Sheng Huang, ZhiHua Wang</i>	
Research on Prevention Measures of 380V Load Branch Over-step Trip in Substation	2037
<i>Zhiyuan Ma, Xianqiang Li, Hui Hou, Huanqing Zhang ,Yuan Jiang, Chaojin Sima, Cong Yu, Du Liu</i>	
A Novel Zero-Residual-Current Arc Suppression Method Using Single-Phase Voltage Source Inverter	2042
<i>Hongbo Yang, Jinrui Tang, Hui Hou, Xixiu Wu, Xinhao Bian</i>	
Fault Analysis of DC-Transformer for DC Distribution Grid	2047
<i>Pu Lin, Zhaoyun Zhang, Shuquan Chen, Zhi Zhang, Xinghua Wang</i>	
Research on Multiple Constraints of Flexible Virtual Capacitor Control for VSC	2052
<i>Meiqi Song, Jianhui Meng, Yi Wang, Jialin Peng</i>	
Modeling of LCC-HVDC Stations Based on Concept of Motion Equation	2057
<i>Jun Lu, Xiaoming Yuan, Jiabing Hu, Meiqing Zhang, Hao Yuan</i>	
Unbalanced Loads Control Strategy for Virtual Synchronous Generator in Passive Network	2063
<i>Xichun Wu, Jun Mei, Bingbing Wang, Dong Liang, Chaoyun Qin, Jin Zong</i>	
The Study of Mechanism and Limit Measures for 500kV Single Phase Short Circuit Current Exceeding Limit in UHVDC Converter Station.....	2069
<i>Xi Wang, Yan Li, Hua Zhang, Xinwei Sun, Lun Tang</i>	
Microgrid Adaptive Current Instantaneous Trip Protection	2074
<i>Bilian Liao, Jie Cheng, Guangwei Ren</i>	
Research on Retrofitting Scheme of Merging Unit and Intelligent Terminal in 500kV Smart Substation.....	2079
<i>Xuanwen Ding, Jie Wu, Yongkang Zheng, Mingzhong Liu, Wenyue Zhou, Dongliang Nan</i>	
Numerical Stability and Compensation Method for Equivalent Controlled Source in Electromagnetic Transient Simulation.....	2084
<i>Lu Gao, Feng Ji, Heming Yan, Chang Lin, Hui Pang, Jihong Li</i>	
Current Amplitude Ratio Based Pilot Protection for the Transmission Line Connected to Inverterinterfaced Renewable Energy Power Plants	2090
<i>Ke Jia, Zhe Yang, Zhengxuan Zhu, Qijuan Zhao, Yu Fang, Qijuan Zhao, Bohan Liu</i>	
Application of Current-Transferring Submodule in Modular Multilevel Converter	2095
<i>Mengxue He, Jun Mei, Guangyao Fan, Rui Ge, Chaoyun Qin, Dong Liang, Jin Zong</i>	
Configuration and Control of Energy Router for Classification and Consumption of Wind Power.....	2100
<i>Jinhao Hu, Jilai Yu</i>	

Electric Spring Control Based on Intelligent Controller and Cascade Second-Order Generalized Integrator Phase Locked Loop	2105
<i>Yuqi Zheng, Jun Long, Haoyan Yang</i>	
OLT Analysis and Protection Control Design for ± 800 kV UHVDC System	2111
<i>Dongliang Nan, Yuting Dong, Hongshan Zhuang, Jie Wu, Yi Yang, Yonghui Sun</i>	
State-of-Charge Dynamic Balancing Control for Multi-energy Storage Units in DC Distribution System	2116
<i>Chen Wang, Yun Zhang, Jianhui Meng, Yi Wang</i>	
Parameter Optimization Method of MMC Controls Based on Firefly Algorithm.....	2121
<i>Tianxiao Huang, Tianzhi Cao, Ziqiang Ran, Binghui Wang, Qing Liu</i>	
Multi-Phase Permanent Magnet Synchronous Generator Variable Speed Constant Frequency Offshore Wind System Based on Modular Multilevel Converter.....	2127
<i>Gang Yao, Yichang Gao, Lidan Zhou, Dongdong Li, Xing Li</i>	
Fault Section Identification Method for Multi-terminal Hybrid HVDC Lines	2133
<i>Kun Zhang, Haifeng Li, Xinchu Zhu, Dachao Huang, Yuansheng Liang, Gang Wang</i>	
The Bidirectional DC/DC Converter Operation Mode Control Algorithm Based on RBF Neural Network.....	2138
<i>Liang Zhang, Kang Chen, Shengbin Chi, Ling Lyu, Huanhuan Ma, Kaiwen Wang</i>	
Impact of Different Protection Outlet Schemes on the Body Equipment of Large Capacity Power Flow Control Device	2144
<i>Yanjun Ma, Huanhuan Qi, Linhai Cai, Guoliang Zhao, Zhanfeng Deng, Zhengang Lu</i>	
Short Circuit Analysis and Coordination of Overcurrent Relays for a Realistic Substation Located in Upper Egypt	2150
<i>Salah Kamel, Ahmed Shaban, Ahmed Korashy, Loai Nasrat, Juan Yu, Shuocheng Wang</i>	
Research on Protection for the Flexible Substation.....	2156
<i>Huanhuan Qi, Zhanfeng Deng, Guoliang Zhao, Zhengang Lu, Linhai Cai, Chaoliang Wang, Feng Xu</i>	
Model Predictive Control of Dual-Active-Bridge Based Fast Battery Charger for Plug-in Hybrid Electric Vehicle in the Future Grid.....	2162
<i>Dehao Qin, QiuYe Sun, Dazhong Ma, Jiazheng Sun</i>	
Dual Grid Voltage Modulated Direct Power Control of Grid-Connected Voltage Source Converter under Unbalanced Network Condition.....	2167
<i>Shuning Gao, Haoran Zhao, Yonghao Gui</i>	
Performance Analysis of the ELIS system for UHVDC Grounding Electrode Line under Line Break Faults	2173
<i>Xiaopeng Li, Yufei Teng, Xinyao Song, Shilong Li, Jing Zhao</i>	

A Dual Inverter Based Grid Connected Solar Power Conditioning System with Coordinated Closed Loop Control.....	2178
<i>Baibhav Kumar Gupta, Amol Iswararao Gedam, K.Ramachandra Sekhar</i>	
Passive Sliding Mode Variable Structure Control for MMC-UPFC.....	2184
<i>Shunchao Ke, Miao Zhu, Yang Chen, Changbao Zheng, Cungang Hu</i>	
Analysis and Design of Half-Bridge LCC Resonant Converter with Buck-Boost Integration Adopting Dual Carrier Modulation	2190
<i>Yiming Chen, Shiyong Yao, Jijun Gou, Jintang Luo, Leiming Lin</i>	
Architecture Design and Evaluation of Hybrid AC/DC Power Grids Based on Power Electronic Transformer.....	2196
<i>Yanhong Yang, Wei Pei, Shizhong Zhang, Hua Ye, Yuxiang Wan, Xiaomin Qi</i>	
Research on the Fault Mechanism of FOCT and Its Reliability Improvement Measures.....	2201
<i>Fubin Pang, Yu Liu, Liangliang Song, Qiangsheng Bu</i>	
Research on Seamless Switching Control Strategy of VSC-MTDC Based on OPF.....	2206
<i>Yutong Liu, Yang Qi, Xiao Pan and Rukong Jin</i>	
Dual-channel Subsynchronous Damping Control Based on Voltage Source Converter Excitation System.....	2212
<i>Jiancheng Zhang, Kuayu Wu, Hongtao Xiong, Boliang Lou</i>	
Research of MMC-UPFC Control Strategy.....	2217
<i>Jianpo Zhang, Ziwei Hu, Diqong Cui, Hongyan Zhang</i>	
A New Method for HVDC Grounding Electrode Line Protection Based on Multi-band Voltage Amplitude Integration	2223
<i>Yi Zhuang, Yufei Teng, Xiaopeng Li, Jiping Lu</i>	
MMC New Type Sub Module Toplogy and Control.....	2228
<i>Jianpo Zhang, Ziwei Hu, Diqong Cui, Xingcheng Tian, Xiuyan Yin</i>	
Improving CFI of LCC-HVDC Systems through Voltage Compensation Using UPFC	2234
<i>Qian Chen, Yunkai Lei, Yunling Wang, Yunche Su, Ao Li, Fang Liu, Yang Liu</i>	
Power Quality Improvement Device for Medium-Voltage Distribution Network.....	2240
<i>Wei Hu, Yu Shen, Fan Yang, Yang Lei, Min Zhang</i>	
Supplementary Damping Control of STATCOM to Mitigate SSCI	2245
<i>Xu Zhang, Xiaorong Xie, Xuan Li, Jan Shair, Chun Liu</i>	
Research on the Model of CVT Operation Performance Based on the PHM System	2250
<i>Sujie Liu, Hao Wang, Xianshun Chen, Ruihan Wang, Cheng Chen</i>	
Quanlitative and Quantitative Analysis on AC-Side Perturbation Characteristics of Voltage-Source Converter	2254
<i>Wen Qian, Yueheng Zhao, Zhimin Wang, Kai Hu, Facai Xing, Zheng Xu</i>	

High-Frequency Modeling of UHVDC Converter Station Based on PSCAD	2260
<i>Chaonan Ying, Zheng Xu, Chenxi Luo</i>	
A General Extended Theory of Interline DC Power Flow Controller	2266
<i>Xu Zhong, Miao Zhu, Yongning Chi, Xu Cai</i>	
Evaluation of Distance Protection Responses in AC Power System With Converter Interface	2270
<i>Hussain Alharthi, Jaber Alshehri, Muhammad Khalid, Ahmed Alzahrani, Mohammed Faggal</i>	
A Control Strategy for Islanded Three-Phase Inverter with Nonlinear and Unbalanced Loads.....	2276
<i>Bo Wang, Fujun Yang, Chang Lu, Yingjun Feng, Chenguang Xiao, Xing Ning, Yang Han</i>	
A Voltage-Balanced Hybrid MMC Topology for DC Fault Ride-through	2282
<i>Mao Ji, Yi Wang, Kaidong Tan, Chen Wang</i>	
Impedance Model of MMC with CCSC and Sampling Delays	2287
<i>Congqi Yin, Xiaorong Xie, Chun Liu, Xiao Wang</i>	
APLL-Based Harmonic Compensation Scheme for DFIG-Based Wind Power Generation System.....	2292
<i>Fujun Yang, Bo Wang, Chang Lu, Yang Han, Xing Ning, Aiting Jiang, Mingyu Luo</i>	
Analysis on Harmonic Resonance of Offshore Wind Farm Transmitted by MMC-HVDC System.....	2296
<i>Lingang Yang, Zhihui Xu, Lu Feng, Zheren Zhang, Zheng Xu, Facai Xing</i>	
Research on Identification and Calculation Method of Harmonic Active Power Responsibility	2302
<i>Min Guo, Weidong Chen, Qingren Jin</i>	
Simulation Research on Switching Process of Reactive Power Equipment in DC Converter Station.....	2308
<i>Xinglong Wu, Zheng Xu, Jian Yang</i>	
Model Predictive Control for Cascaded Multilevel Inverter Based on Lyapunov Function	2314
<i>Rao Rao, Shiyong Hou</i>	
Active Power Sharing Performance Analysis of Consensus-Based Control Considering Continuous Disturbances in AC Microgrids.....	2319
<i>Sicheng Deng, Lajun Chen, Xiaonan Lu, Libin Yang, Tianwen Zheng, Shengwei Mei</i>	
Impacts of Switching AC Filters of UHVDC Converter Stations on Harmonics.....	2325
<i>Shanshan Luo, Bing Chen, Nayan Yu</i>	
Research on the Key Technologies of Battery Energy Storage Power Station for Plug and Play Operation	2330
<i>Anping Hu, Guanjun Li, Ting Yang, Liang Zhang, Henghua Shui, Chen Fang</i>	
A Non-iterative Switching Status Combination Judgement Algorithm for Half-Bridge Sub-circuit Based Voltage-Source Converters in EMTP-Type Simulation Program	2336
<i>Rui Zhang, Yankan Song, Zhitong Yu, Ying Chen, Shaowei Huang</i>	

Optimal Control of Three-Level Dual Active Bridge DC-DC Converter under Dual Phase-Shifted Modulation	2341
<i>Tao Wang, Alian Chen, Chaochao Song</i>	
Data Center Visualization Based on uDC-Builder.....	2347
<i>Zhenyu Tang, Xujing Wen, Yan Wu, Yuan Yin, Luo Cheng Shen</i>	
An Enhanced Droop Control Strategy for Accurate Reactive Power Sharing in Islanded Microgrids	2352
<i>Shujie Zhang, Chunmeng Chen, Ling Dong, Yongbin Li, Jianyong Zhao, Heng Nian, Liang Kong</i>	
Fractional Phase Lead Compensation for PIMR-Type Repetitive Control on a Grid-Tied Inverter	2357
<i>Sainan Chen, Qiangsong Zhao, Xiaolei Wang, Dongyun Wang, Xiaohui Lu</i>	
Active Frequency Support Control of Energy Storage Power Station Based on Photovoltaic and Energy-storage Microgrid	2362
<i>Ting Yang, Hongfen Cui, Liang Zhang, Bo Yang, Guan Jun Li, Yongcan Lu</i>	
A Rapid Method for Voltage Sag Detection Based on Adaptive Order Morphology	2368
<i>Chunlin Guo, Kai Ma, Xiangzheng Song, Jianing Wang</i>	
Non-invasive Electromagnetic Sensor for Residential Harmonic Distortion.....	2374
<i>Qihang Gong, Guangchao Geng, Quanyuan Jiang</i>	
The Realized Forms of Power Electronics Technology in New Generation Distribution Power System	2379
<i>Lu Shengzhi, Sun Weibing, Zhan Xin, Zhou Feng, Cao Yezhang, Zhang Zhixia</i>	
A Virtual DC Machine Control Strategy for Dual Active Bridge DC-DC Converter.....	2384
<i>Yu Guo, Jianhui Meng, Yi Wang, Chen Wang</i>	
Comparison between Two LCL DC Transformer Topologies: SCR-LCL and IGBT-LCL.....	2389
<i>Mohammed A. Abdulgalil, Abubakr H. Elsayed, Muhammad Khalid, Ibrahim M. ElAmin</i>	
Power Quality Disturbance Detection of DC Distribution Network Based on Tsallis Wavelet Entropy	2395
<i>Xian Wu, Hongkun Chen, Lei Chen, Qing Chen, Yuan Dong, Jingtang Yang, Xiaolong Xiao</i>	
Fault Location for HVDC Transmission Lines Using Interference Cancellation.....	2400
<i>Yongchao Sun, Mei Sun, Zhenchao Jiang, Yufei Teng, Peng Zhang, Xiaopeng Li, Rongsen Luo</i>	
A Control Methodology of Inverter-Based Battery Energy Storage System for AC Microgrid	2406
<i>Thanakrit Kittiwarat, Kittanut Pongjirapat, Raksina Khanaroek, Surapong Suwankawin</i>	
A Robust and Resilient Voltage Control Strategy for Smart Grids Using Distributed Measurements.....	2411
<i>Rajkumar Palaniappan, Alexander Funke, Dominik Hilbrich, Björn Bauernschmitt, Christian Rehtanz</i>	
Mathematical Model of Four-Winding Inductive Filtering Converter Transformer and Its Application	2416
<i>Jing Sun, Longfu Luo, Zhao Huang</i>	

Restoration of a Meshed HVDC Grid with Non-selective Protection Strategy.....	2422
<i>Qi Zhang, Zhou Liu, Zhe Chen</i>	
PSO-Based Secondary Frequency Control and Active Power Sharing	2428
<i>Mahmuda Begum, Li Li, Jianguo Zhu</i>	
✦ Emerging Technologies and End-User Systems	
Power Optimization Strategy for Typical Industrial Users under the Condition of Time-of-Use Pricing	2434
<i>Gang Wang, Xiaokui Zang, Chen Yang, Yichen Xu, Peng Nan, Leijiao Ge</i>	
Multiple Loads-Single Smart Meter for Measurement and Control of Smart Grid	2440
<i>Brandon S. England, Ali T. Alouani</i>	
Optimization of Micro-grid Dispatching Based on Adaptive Chaos Particle Swarm Optimization	2445
<i>Ning Li, Xianwu Shan, Lu Heng, Yongping Ren, Hongwei Pan, Leijiao Ge</i>	
Stability Analysis of A DC Distribution System for Power System Integration of Plug-In Electric Vehicles	2450
<i>Zhiyu Wei, Ke Peng, Jiajia Chen, Xi Yan, Qing Wan</i>	
Optimal Operation of Hybrid AC/DC Distribution Network Based on Two-Stage Robust Optimization Model and Corrective Control.....	2456
<i>Yang Fu, Zhenkun Li, Xiaolin Ge, Zhiquan Zhang</i>	
Research on Repairing Technology of a Slit on Shield	2462
<i>Tingting Luo, Zhiqiang Yang, Fei Ao, Dun Liu, Wangneng Zhu</i>	
Energy Savings Using Direct Current (DC) from Photovoltaic (PV) System in a Residential Home	2467
<i>Y. Z. Luo, T. T. Lie</i>	
Air Conditioning Cooling Power Prediction of Provincial Residents Based on Regional Comprehensive Temperature	2472
<i>KangLi Xiang, BoJian Chen, Xiaohan Yu, Yi Du, Changyong Lin, Xianan Huang, Xiazhe Tu, Yuanfei Li</i>	
Operational Benefits Assessment of Demand Response Based on Linearized Consumers Satisfaction Constraints and Stochastic Simulation Method	2476
<i>Min Zhang, Xiaoyu Cao, Jianxue Wang</i>	
Stochastic Security Constraint Unit Commitment Considering the Correlation of Electric Vehicles' Driving.....	2482
<i>Aiqiang Pan, Xiaolin Ge, Yunpeng Wang, Chenhao Pei, Shu Xia</i>	
Household Energy Consumption Behaviors Analysis Based on Chicken Swarm Optimization and PrefixSpan Algorithm	2488
<i>YunCong Yang, Jian Li, Chen Luan, Huang Qi, DongSheng Cai, Zhao Jin, ZhiLiang Wang</i>	

Optimal Operation of AC/DC Hybrid Micro Grid Considering Night Energy Storage Constraints.....	2493
<i>Linjun Shi, Wei Wei, Haoqing Zhu, Xiaodong Yuan, Juntao Fei, Kejun Qian</i>	
Cost Management Evaluation of Power Grid Engineering: A Life Cycle Theory	2499
<i>Jie Jiao, Ying Du, Jie Yang, Yanan Tian, Lin Hu, Qian Wang</i>	
Nonintrusive Load Monitoring Based on Particle Swarm Optimization	2505
<i>Qi Fu, Yi Guo, Xia Liu, Xiaolan Wang, Xiaotian Dai</i>	
Calculation and Analysis of Energy Storage Demand in Shanxi Power Grid	2510
<i>Zhang Shifeng, Yang Yunlei, Chang Xiao, Zhao Jun, Fan Rui, Wang Tan, Wang Jinhao</i>	
Temporal and Spatial Pricing for Optimal Electric Vehicle Charging and Discharging Management.....	2516
<i>Xianzhong Dai, Yufeng Chai, Xinyang Han, Xiangpeng Zhan, Jun Yang</i>	
Study of Intelligent Inspection for Distribution Network Based on Internet of Things	2522
<i>Zhichun Yang, Yu Shen, Fan Yang, Yang Lei, Lei Su, Fangyi Chen, Zilin Wan</i>	
Impact of Time-Shiftable Traffic Demands on Coupled Transportation and Power Distribution Systems	2527
<i>Longxian Hu, Wei Wei, Ziqi Shen</i>	
A Two Stage AC-DC Converter for Speed Control of a DC Motor.....	2532
<i>Anupam Dixit, Bryce Hillam</i>	
Improved Droop Control Strategy for Reactive Power Sharing of Parallel Inverters in Low-Voltage Microgrid	2538
<i>Xiaodan Bai, Hong Miao, Chengbi Zeng</i>	
A Coordinated Voltage Control Strategy for Coordination of Wind Turbines Variable Mode Control and OLTC in Distribution Grid	2544
<i>Wei Huang, Tianfei Guo, Yu Gao, Liangliang Hua</i>	
The Research of Users-Transformer Relationship Verification Method Based on Data-Driven.....	2550
<i>Ping Li, Yonghui Yan, Mingzhu Xu, Fei Liu, Jinran Wang, Xinran Li, Ling Liu, Guoqiang Sun</i>	
Cooperative Energy Management for Enterprise Microgrid Using Electrical Energy Router	2555
<i>Shiqing Jiao, Yong Li, Sijia Hu, Yu Zhang, Xiaohui Song, Li He, Jingrong Shi</i>	
Impacts of Zero Net Energy Buildings on Customer Energy Savings and Distribution System Planning	2561
<i>Ming Liang, Jiyu Wang, Yao Meng, Ning Lu, David Lubkeman, Andrew Kling</i>	
Reliability Evaluation of Voltage Source Converters for MVDC Applications.....	2566
<i>Gayana Abeynayake, Gen Li, Tibin Joseph, Wenlong Ming, Jun Liang, Andrew Moon, Kevin Smith, James Yu</i>	
Stable Segment Method for Multiple Linear Regression on Baseline Estimation for Smart Grid Fast Automated Demand Response.....	2571
<i>Shun Matsukawa, Chuzo Ninagawa, Junji Morikawa, Takashi Inaba, Seiji Kondo</i>	

Optimal Scheduling of Integrated Energy Systems Considering Multi-energy Flow Constraints	2577
<i>Dawei Chen, Can Wan, Shufeng Dong, Yonghua Song</i>	
A Novel Optimal Operation of Integrated Electrical and Heating System with Photovoltaic and Solar Thermal System	2583
<i>Yuchen Song, Weihao Hu, Xiao Xu, Qi Huang, Zhe Chen</i>	
Research Status and Prospective on Current Transformer Saturation Recognition	2589
<i>Wenchao Lu, Jiandong Duan, Qian Sun, Yulin Cheng</i>	
Oriented Electric Vehicles and DC Charging Piles Feasibility Analysis of Power Line Communication Based on OFDM	2595
<i>Liang Zhang, Shengbin Chi, Kang Chen, Ling Lyu, Huanhuan Ma</i>	
A Optimal Algorithm for DC Breakers Configuration in Multi-terminal DC Systems.....	2601
<i>Shengjie Hu, Yuhong Wang</i>	
Low Complexity Non-Intrusive Load Disaggregation of Air Conditioning Unit and Electric Vehicle Charging	2607
<i>Attique Ur Rehman, Tek Tjing Lie, Brice Vallès, Shafiqur R. Tito</i>	
Electromagnetic Transient Simulation Analysis for the 500 kV Saturated Iron-Core Superconducting Fault Current Limiter.....	2613
<i>Mengze Yu, Haifeng Hong, Huixiang Chen</i>	
Study on Evaluation of Sampling Test Efficiency for Distribution Transformer	2619
<i>Jinmeng Chen, Yi Li, Maohuan Fang, Jingqing Zhang, Hui Li</i>	
STATCOM Based Network Voltage Unbalance Mitigation for Sub-transmission Networks	2624
<i>T. D. Kahingala, S. Perera, and A. P. Agalgaonkar, U. Jayatunga</i>	
Integration of Electric Vehicles into Power Grid Based on Probabilistic Simulation.....	2629
<i>Yuan Xu, Tao Li, Hui Xu, Feng Gao, Tian Xia, Qinglai Guo, Jun Hu</i>	
Technical and Economic Analysis of Aluminum Conductor with Multi-stranded Composite Core and Its Application	2634
<i>XuZhu Dong, Ruihai Li, Yongli Liao, Jinqiang He, Bo Gong, Lingmeng Fan, Dannan Zheng, Weizhuo Chen, Yan Zhu, Qingming Wang, Zhengmin Zhou</i>	
An Optimal Operational Strategy for Vanadium Redox Flow Battery Based on Particle Swarm Optimization.....	2639
<i>Binyu Xiong, Zirui Wang, Yang Li, Kun Qin, Jizhong Chen, Juyi Mu</i>	
Equivalent Modeling of Power Electronic Transformer in AC-DC Hybrid System	2644
<i>Wenzhi Zhao, Jinghong Zheng, Zeming Zheng, Zonghang Han</i>	

Residual Capacity Estimation of Valve-Regulated Lead-Acid (VRLA) Batteries for Second-Use.....	2650
<i>Zhirui Liang, Zhengxiang Song, Jianhua Wang, Guogang Zhang, Xian Wang</i>	
Grounding Current of Converter Transformer Core and Core Clamp and Its Harmonic Characteristics	2655
<i>Minghong Su, Xiao Yao, Dianbo Zhou, Yuhang He, Jing Zhang</i>	
Optimal Dispatching Strategy of Load Aggregators Considering Peak Load Shifting.....	2661
<i>Ying Wei, Zhihao Yang, Haoming Liu</i>	
Dynamic Feeder Reconfiguration in Automated Distribution Network Integrated with Renewable Energy Sources with Respect to the Economic Aspect	2666
<i>Ali Azizivahed, Hossein Lotfi, Mojtaba Jabbari Ghadi, Sahand Ghavidel, Li Li, Jiangfeng Zhang</i>	
Research on Meteorological Sensitive Load in Jiangsu Based on Meteorological Dominant Factors	2672
<i>Jing Shi, Delv Zhu, Hu Li, Bingjie Li, Jian Tan, Yunli Shi</i>	
Optimal Configuration of Energy Storage Capacity in Multi-energy System with Temperature Control Equipment Based on Discrete Fourier Transform	2677
<i>Shuocheng Wang, Bo Hu, Kaigui Xie, Jiahao Yan, Yanlin Li, Huawei Chao, Yi Zeng</i>	
Planning of Central Energy Station in Community Integrated Energy System with Electrical and Heat Storage Devices	2682
<i>Li Yu, Jinyong Lei, Xiaobin Guo, Peng Li, Cheng Li, Guanyu Song, Yusheng Wu</i>	
LBBF Algorithm for TDMA Time Slot Scheduling in VPLC System Based on HomePlug AV.....	2688
<i>Jian Cao, Xiaosheng Liu, Honghong Pu, Ying Cui, Huabao Xie, Dianguo Xu</i>	
Real-time Model Predictive Control for The Regional Autonomy Multi-microgrids With Three-Phase/Single-Phase Architecture	2693
<i>Yuhua Lv, Ping Yang, Zejian Liu, Ying Chen, Jintao Chen</i>	
Control Strategies for Energy Optimization of HVAC Systems in Small Office Buildings Using EnergyPlus TM	2698
<i>Mubashir Wani, Akshya Swain, Abhisek Ukil</i>	
Decentralized MPC-Based Frequency Control of Networked Microgrids.....	2704
<i>Kun Liu, Tao Liu, David J. Hill</i>	
A Frequency Control Strategy Using Electric Vehicles Considering Travelling Demand.....	2709
<i>Chenglin Li, Zheng Xu, Yu Zhou, Wanqing Chen, Xianjun Meng</i>	
Interaction Characteristics of Ports of PET in AC/DC Hybrid System under Large Disturbances	2714
<i>Zonghang Han, Jinghong Zheng, Wenzhi Zhao, Zeming Zheng</i>	
Research on the Optimal Economic Dispatching of Micro-grid with Hybrid Energy Storage	2720
<i>Changqing Yu, Chunyan Li, Chenyu Zhao, Wenyue Cai, Lili Wen, Xuan Fan</i>	

Influence Analysis of Droop Coefficients on Load Margins for AC/DC Hybrid Microgrids.....	2726
<i>Lei Pang, Bei Han, Keyou Wang, Guojie Li, Haijun Liu, Shihui Yang</i>	
Research on a Typical Connection Mode of Flexible DC Distribution Applied to High Reliability Area	2732
<i>Jian Yuan, Lin Su, Anxin Yan, Ruoxuan Sun</i>	
Short-Term Load Forecasting of Microgrid Based on Grey Correlation Analysis and Neural Network Optimized by Mind Evolutionary Algorithm	2738
<i>Haoyan Yang, Jun Long, Penghui He, Yuqi Zheng</i>	
Integrated Power Hardware-in-the-Loop and Lab Testing for Microgrid Controller.....	2743
<i>Hiroshi Kikusato, Taha Selim Ustun, Masaichi Suzuki, Shuichi Sugahara, Jun Hashimoto, Kenji Otani, Kenji Shirakawa, Rina Yabuki, Ken Watanabe, Tatsuaki Shimizu</i>	
Asymmetric Fault Propagation Mechanism on AC Side of Hybrid Microgrid and Suppression Methods	2748
<i>Zhu Yongqiang, Liu Kang, Zhang Quan, Han Minxiao, Che Kai, Jia Yongyong</i>	
Reliability Evaluation of Offshore Oil Platform Power System.....	2754
<i>Wei Du, Xianjue Luo, Xue Li, Jun Guan, Chang Xiong, Deyi Li</i>	
Hybrid Energy Storage System for Voltage Stability in a DC Microgrid Using a Modified Control Strategy.....	2760
<i>Khalid Abdullah Khan, Muhammad Khalid</i>	
Cooperative Control in an Islanded Microgrid under Blockchain-Based Market Operation	2766
<i>Huan Aaron Li, Nirmal-Kumar C. Nair</i>	
Research on AP Clustering of Weighted Load Index for Demand Response Potential Analysis	2772
<i>Chenyu Zhao, Chunyan Li, Wenyue Cai, Zongdai Lin, Xin Wang, Ping Zhou, Yi Zeng</i>	
Comparison of Dispatch Strategy in Hybrid Energy Micro-grid with High PV Penetration.....	2778
<i>Aobo Zhou</i>	
Inference of Tampered Smart Meters with Validations from Feeder-Level Power Injections.....	2783
<i>Yachen Tang, Chee-Wooi Ten, Kevin P. Schneider</i>	
Study on the Influence of Key Structure Parameters of Conical Insulator on AC and DC Electric Field Distribution ...	2789
<i>Jianying Zhong, Bo Zhang, Liucheng Hao, Yapei Liu, Yingqian Du</i>	
Peak Shaving of an EV Aggregator Using Quadratic Programming.....	2794
<i>MinGyu Seo, ChungHun Kim, SeKyung Han</i>	
Optimal Electric Bus Charging Scheduling for Local Balancing of Fluctuations in PV Generation	2799
<i>Jakub Szcześniak, Tobias Massier, Marc Gallet, Anurag Sharma</i>	
Research on a Kind of Ubiquitous Power Internet of Things System for Strong Smart Power Grid	2805
<i>Xu Bin, Chen Qing, Ma Jun, Yu Yan, Zhang Zhixia</i>	

Optimal Coupling of Multiple Microgrid Clusters	2809
<i>Md Asaduzzaman Shoeb, Farhad Shahnia, GM Shafiullah</i>	
Research on Wind-Hydro-Thermal Power System Multi-time Scale Coordinated Optimal Dispatch	2815
<i>Honglian Ma, Wei Du, Qi Wang, Naiwei Gong</i>	
Energy Management for Standalone DC Microgrid Using Artificial Bee Colony	2820
<i>Shehab Al-Sakkaf, Mahmoud Kassas, Muhammad Khalid</i>	
Smart Street Lighting System with Networking Communication	2826
<i>Nathawat Sukhathai, Thavatchai Tayjasanant</i>	
Technical Analysis of the Charge/Discharge Rate and the Capacity of Batteries in Meeting the Residential Peak Demand within a Community Solar	2832
<i>Muhammad Adnan Hayat, Farhad Shahnia, GM Shafiullah</i>	
Microgrid Reliability Evaluation Using Distributed Energy Storage Systems	2837
<i>Mohammed A. Abdulgalil, Muhammad Khalid, Jaber Alshehri</i>	
Blockchain Based Domestic Appliances Scheduling in Community Microgrids.....	2842
<i>M. Afzal, Khalid Umer, Waqas Amin, M. Naeem, Dongshang Cai, Zhenyuan Zhang, Huang Qi</i>	
Belief Propagation and H-infinity Controller for Microgrid State Estimation and Stabilization Using Internet of Things Technologies	2848
<i>Md Masud Rana, Rui Bo</i>	
Noise Suppression in Compressive Imaging for Power Internet of Things	2853
<i>Yaoran Huo, Jian Chang, Cheng Liu, Jiazhou Li, Fan Yang, Yu Zeng, Xuan Xu</i>	
Field Implementation of a Real-Time Battery Control Scheme for a Microgrid at the University of California, Riverside	2859
<i>Yun Xue, Michael Todd, Sadrul Ula, Alfredo Martinez-Morales</i>	
Semi-fragile Watermarking for Color Image Authentication in Power Internet of Things.....	2865
<i>Yaoran Huo, Jiajia Liu, Qin Zhang, Yu Zeng, Fan Yang, Jian Chang, Yuqiang Fan, Cheng Liu</i>	
Modeling and Simulation of Virtual Synchronous Generator for Photovoltaic Inverter	2870
<i>Shunlai Wang, Qiongfeng Zhu, Shouhong Feng, Yufeng Wang, Zixiao Xu, Jingru Yang, Bowen Zhang, Weilin Li</i>	
Noncontact Current Source Reconstruction Based on Independent Component Analysis – A Simulation Study.....	2876
<i>Ayambire Patrick Nyaaba, Qi Huang, Jian Li, Siming Pan, Bin Gao, Guiyun Tian, Shijun Zhang, Bin Xiao</i>	
✦ Electricity Market, Innovative Business Mechanism, Policy/Regulatory Aspects	
Real-Time Economic Dispatch and Subinterval Coordination Strategy to Benefit System Operations.....	2881
<i>Chenghui Tang, Fan Zhang, Zheng Zhao</i>	

Operational Reliability Analysis of Grid-Connected Microgrid Considering Operating Strategy in Market Environment	2887
<i>Biyun Chen, Hengwang Zhou</i>	
The Dynamic Subsidy Pricing Mechanism of Clean Energy Central Heating	2892
<i>Xin-Nan Zhou, Zhong-Lin Yi, Zhi-Jie Sun, Feng Xie, Jun Fu, Xuan-Yuan Wang, Li-Rong Duan, Feng-Tao Guang, Zhe Jiao</i>	
Development of Incentive Model for Photovoltaic Generators to Participate in a Day-ahead Electricity Market in South Korea	2898
<i>Junhyuk Kong, Jaesung Jung</i>	
Economic Evaluation Model and Application Tool of Electric Energy Substitution	2903
<i>Xin-Nan Zhou, Zhi-Jie Sun, Feng Xie, Bei-Bei Sun, Mao-Yi Fang, Zeng-Hui Meng, Wen-Xiu Yang</i>	
Long-Term Electricity Price Forecast Using Machine Learning Techniques	2909
<i>Ashkan Yousefi, Omid Ameri Sianaki, Dean Sharafi</i>	
Optimal Power Transfer Limit Planning for Energyintensive Industry Microgrid Considering Economic Accommodation of Wind Power	2914
<i>Yuzhou Zhou, Qiaozhu Zhai, Pai Li</i>	
A Power Spot Market Model and Construction Path Considering Demand Response	2920
<i>Changyong Lin, Yi Du, Shengzhou Ke, Kangli Xiang, Yang Yi, Yuanfei Li</i>	
Long and Medium-Term Power Market Trading Security Checking Method Based on Multi-scenario New Energy Prediction.....	2926
<i>Gang Qiu, Guoqing Li, Guilian Xiao, Yanjun Xue, Deliang Zhang, Wukui Zhai</i>	
Research on Relationship between Energy-Economy-Environment and Index System under the New Situation	2932
<i>Yi Du, Kangli Xiang, Yuanfei Li, Changyong Lin, Xiangnan Huang, Hongyang Lin</i>	
Research on the Electricity Market Clearing Model and Price Fluctuation with Wind Power.....	2936
<i>Peizheng Xuan, Jizhong Zhu, Jin Zou, Pingping Xie</i>	
The Day-Ahead Optimization Scheduling of CCHP Energy System with Multi-mode Energy Storages	2941
<i>Hu Wei, Lu Xiao, Jing Jiangping, Wang Jinran, Zang Haixiang, Wei Zhinong</i>	
Bi-level Demand Response Scheme in the Presence of Aggregators with Thermally Responsive Loads	2946
<i>Youbo Liu, Xiaodi Wang, Junyong Liu, Hongjun Gao</i>	
From Uncertainty Elimination to Profit Enhancement: Role of Data in Demand Response	2952
<i>Bohong Wang, Qinglai Guo, Tianyu Yang</i>	

Analysis on Construction and Development of Hubei Electricity Sale Market	2958
<i>Defu Cai, Wenna Wang, Kunpeng Zhou, Bingke Yan, Li Wan, Chu Zhou, Yuchuan Hu, Xiaodong Yu, Ying Wang</i>	
Simulation and Analysis of Centralized Bidding Market Clearing Method Based on Intelligent Algorithm.....	2963
<i>Long Huang, Haoyong Chen</i>	
Two-Stage Economic Dispatch Optimization for Integrated Energy System Using Improved Brain Storm Optimization Algorithm	2968
<i>Tiannan Ma, Lilin Peng, Ying Du, Zhuangzhuang Yu</i>	
Hydro-Dominated Power Markets in Southwest China: Characteristics and Challenges	2974
<i>Shumin Miao, Bin Luo, Liang Wang, Gang Chen, Hua Zhang, Jichun Liu, Jianhua Li</i>	
Economic Dispatch and Frequency-Regulation Reserve Capacity Integrated Optimization for High-Penetration Renewable Smart Grids	2980
<i>Hong-Tzer Yang, Yi-Syuan Wu, Jian-Tang Liao</i>	
Experimental Analysis of Equilibrium of Long-Term Market Clearing Mechanism in China	2986
<i>Jingyi Shang, Xin Jiang, Jinfeng Gao, Haoyong Chen, Ke Shi</i>	
Look-Ahead Strategic Offering for a Virtual Power Plant: A Multi-stage Stochastic Programming Approach.....	2991
<i>Yuzhou Zhao, Rongpeng Liu, Shunbo Lei, Yunhe Hou</i>	
Research on the Economic Benefit of Energy Storage System Works with Photovoltaic System Considering the Cost of Electricity	2997
<i>Chunlin Guo, Qinbo Yu, Xiangzheng Song, Jingjing Yang</i>	
A Pricing Mechanism for BESS in Frequency Regulation Considering Penetration of the Renewables.....	3003
<i>Jihui Zhang, Shengqi Zhang, Yateendra Mishra</i>	
Energy Storage-Transmission Line Planning Based on Complete Information Static Game Model.....	3009
<i>Cai Sun, Laijun Chen, Liufang Wang, Wei Wei, Tianwen Zheng, Shengwei Mei</i>	
Dynamic Analysis of Operating Reserve Demand Curve in Energy-Only Electricity Markets	3015
<i>Sreelatha Aihloor Subramanyam, Xuewei Zhang, Jinjie Wu, Huihui Song</i>	
Construction and Enlightenment of Japan's New Electricity Market.....	3020
<i>Yumeng Liu, Haoyong Chen</i>	
Agent-Based Models in Electricity Markets: A Literature Review.....	3026
<i>Priyanka Shinde, Mikael Amelin</i>	
A Robust Operation Strategy for Energy Storage Considering Uncertainty in Electricity Price	3032
<i>Jingyi Shang, Xin Jiang, Wenqian Yin, Yunhe Hou, Zhihao Yang, Haoming Liu</i>	

Application of Two-Stage Feature Selection Technique in Power Load Forecasting Considering Delayed Effect.....	3037
<i>Min Liu, Weifeng Liu, Yidan Xu, Peng Wang, Dengke Wang</i>	
Two-Stage Optimization Method for Medium and Long-Term Electric Quantity Security Check.....	3041
<i>Lili Li, Li Chang, Junfeng Yang, Xiaoyu Zheng</i>	
Marketing Models and Value-Added Services of Power Grid Enterprises in Chinese Electricity Market Environment	3046
<i>Jianfu Chen, Yuanji Cai, Jianbiao Li, Yao Liu, Xingyu Pei</i>	
Shapley Value Based Customers Voluntary Demand Response Program: A Stackelberg Game Approach	3051
<i>Jun Wang, Qi Huang, Weihao Hu, Jian Li, Zhenyuan Zhang, Dongsheng Cai, Xiaoyuan Zhang, Xianbo Wang, Changhai Li</i>	
System Frequency Performance of the Australian National Electricity Market with Energy Transformation	3057
<i>Shilpa Kala, John Fletcher, Jahan Peiris, Ahmad Shabir Ahmadyar</i>	
Wind Power Prediction Based on Principal Component Analysis and Long Short-Term Memory Networks.....	3063
<i>Weiming Lang, Xiangjin Ma, Yanhong Luo, Bowen Zhou, Dongsheng Yang</i>	
Demand for Energy Storage: Case Studies for Chinese Power System in 2035 and 2050	3069
<i>Mingliang Cao, Guohe Li, Yong Sun, Wei Xu, Jie Sheng, Xiaorong Xie, Hao Nan</i>	
Intra-Day Multi-sequential Generation Schedule Considering Energy Storage System.....	3074
<i>Zhi Cai, Qiang Ding, Sai Dai, Yanfeng Ge, Songjie Shi, Jiawei Huang</i>	
Design and Research on Electricity Market Operation System in Southern Region	3080
<i>Xiaojuan Wang, Haoyong Chen, Long Huang</i>	
Self-Learning Prosumer in Competitive Local Energy Market	3085
<i>Tao Chen, Can Huang, Fengkai Hu, Junbo Zhao, Wencong Su</i>	
Research on Lean Management of Power Marketing Strategy in Power Grid Enterprises.....	3091
<i>Chao Sun, Yingjie Zang, Jingwen Sun, Yanbo Liu</i>	
Research on Evaluation Indicators System for Electricity Market in China	3095
<i>Xiaocen Xue, Changyou Zhou, Yeyang Zhu, Zehong Li, Yangchao Zeng</i>	
Integrated Flexible Resources and Energy Markets in the Danish Multi-energy System.....	3099
<i>Yufei Xi, Jiakun Fang, Zhe Chen, Henrik Lund, Søren Møller Thomsen, Anders Dyrelund, Per G. Kristensen</i>	
A P2P Trading Mechanism of Distributed PV Based on Continuous Matching	3104
<i>Sifan Jiang, Can Wan, Yanbo Jia, Yonghua Song</i>	
Smart Micro-grid: An Immediate Solution to Nigeria's Power Sector Crisis	3110
<i>Olusola Bamisile, Huang Qi, Weihao Hu, Olufunso Alowolodu</i>	

◆ Smart DC Distribution Systems

A Two-Stage Improved Droop Control Method for Economic Operation of Islanded DC Microgrids.....	3116
<i>Fengzhou Sun, Pengcheng Yang, Jie Zhu, He Zhao, Miao Yu, Wei Wei</i>	
Optimal Hierarchical Voltage Control for VSC-MTDC Distribution Network.....	3122
<i>Lawrence Bibaya, Chongru Liu, Gengyin Li</i>	
Overall Control Architecture of VSC based MV and LVDC Distribution and Utilization Systems	3128
<i>Qing Chen, Yizhen Wang, Haitao Liu, Yu Ji, Xiong Xiong, Dong Yuan, Xinyao Si, Xiaolong Xiao</i>	
Distributed Dual-Loop Active Disturbance Rejection Control for DC Microgrids.....	3134
<i>Chun Wei, Jianqi Xu, Youbing Zhang, Yangwu Shen</i>	
Risk Analysis and Study of Wind Turbines Off-Grid Based on AC/DC Hybrid Grid.....	3139
<i>Yuhang Luo, Wei Zhang, Hualing Han, Quan Li, Yuqiu Zhou, Peifeng Xi</i>	
Transient Voltage of Hybrid DCCB for MVDC Distribution Grids and Its Mitigation	3145
<i>Hong Cao, Zexin Zhou, Xiaodong Zhang, Dingxiang Du, Xingguo Wang, Weijie Wen, Jiuxin Ma</i>	

◆ Stochastic and Robust Optimization for Power System with High-Level Uncertain Renewable Energy Resources

A Two-Stage Stochastic Operation Approach of Combined Heat and Power Networks.....	3150
<i>Yumin Chen, Yan Xu, Zhengmao Li, Xue Feng, Hongming Yang, Luiz Carlos Pereira Da Silva, Ashu Verma</i>	
Stochastic Optimal Power Flow for Islanded Microgrids Considering Droop Control	3156
<i>Daichen Liu, Cuo Zhang, ZhaoYang Dong</i>	
Extracting Time-Varying Subsynchronous Oscillation in Wind Power Systems through Kalman Filtering.....	3162
<i>Jan Shair, Chen Wu, Wei Huang, Xiaorong Xie</i>	
An Improved Scenario Reduction Technique and Its Application in Dynamic Economic Dispatch Incorporating Wind Power.....	3168
<i>Yating Zhou, Libao Shi, Yixin Ni</i>	
Dynamic Reactive Power Robust Allocation Based on Linear Power Flow for Large-Scale Wind Farm Integration	3174
<i>Mang Jiang, Chi Xu, Qinglai Guo, Wei Wang, Huaichang Ge, Bin Wang</i>	
The Impact of Grid Uncertainties on Optimal Transmission Switching	3179
<i>Tian Lan, Garng M. Huang, Zhangxin Zhou</i>	
Multi-period Stochastic Economic Dispatch of Microgrid Considering Renewable Energy Uncertainty Using Parallel Algorithm	3185
<i>Bo Feng, Hongyu Yang, Qingrun Yang, Tao Ding, Haixiang Zang</i>	

An Optimized Control Model of Battery Energy Storage Systems for Primary Frequency Response	3190
<i>Xiwen Cui, Xinran Li, Kun Zhang, Yizhang Wen, Ya Meng</i>	
Probabilistic Transmission Network Expansion Planning Considering Integration of Wind Power	3194
<i>Heng Zhang, Shenxi Zhang, Haozhong Cheng, Zheng Wang, Jianping Zhang</i>	
✦ Planning, Operation and Control of Large-Scale Electrical Vehicle for Its Integration with Power Systems and Transportation Systems	
A Locating Method of EV Fast Charging Stations Based on the Conditional Generative Adversarial Networks	3199
<i>Chunfei Wang, Yingyun Sun, Lei Dong</i>	
Operation of an ICE/PM/TTRB APU in a Range Extender Electric Vehicle Power-Train	3205
<i>Yongpeng Shen, Gaorui Ge, Ankang Liu, Zhufeng Zheng</i>	
Coordinated Control Strategy of Electric Vehicles and Energy Storage System for Smoothing Power Fluctuations of Photovoltaics	3211
<i>Huayanran Zhou, Yang Li, Junjie Hu</i>	
Analysis of Charging Demand of Household Electric Vehicles Based on Travel Characteristics	3217
<i>Xingang Yang, Yahui Cai, Meixia Zhang, XiuYang</i>	
Optimal Charging Strategy of an Electric Vehicle Aggregator in Ancillary Service Market	3223
<i>Zhouyang Wu, Junjie Hu, Jiechen Wu, Xin Ai</i>	
Spatial-Temporal Charging Pattern Analysis for Electric Taxi Grid Integration Study	3229
<i>Haidong Yu, Aiqiang Pan</i>	
Wind Power Fluctuation Absorption through EV Charging Power Control Based on Markov Chain.....	3235
<i>Xin Pei, Chunlin Guo, Xiangzheng Song, Chun Li, Kai Ma</i>	
✦ Planning and Operation of Smart Distribution Network with High Penetration of Distributed Energy Resources and Electric Vehicles	
The Integrated Generation and Transmission Expansion Planning Considering the Wind Power Penetration.....	3240
<i>Haijun Xing, Hong Fan, Shaoyun Hong, Jing Lei, Shiqian Li, Gang Ren, Yanfang Wu</i>	
Statistical Characterization of Solar Irradiance Variability and Its Effect on Step Voltage Regulators	3245
<i>Yi Cui, Feifei Bai, Yilu Liu, David Smith</i>	
Multi-objective Planning of Soft Open Point in Active Distribution Network Based on Bi-level Programming	3251
<i>Shenxi Zhang, Ke Li, Libo Zhang, Heng Zhang, Jiawei Lyu, Haozhong Cheng</i>	

Sizing Approach of Distributed Energy Storage System in the Presence of Aggregators.....	3256
<i>Youbo Liu, Yue Xiang, Zao Tang, Mingjuan Wang, Quan Tang, Weiting Xu</i>	
Bandpass Filtering Scheme for Improving Phasor Measurement Accuracy	3262
<i>Xingchen Han, Hengxu Zhang, Fang Shi, Peng Wang, Yunbo Wang</i>	
Siting of Electric Vehicle Charging Stations Based on Weighted Voronoi Diagram: A Graphic User Interface Design	3267
<i>Jinpeng Meng, Yue Xiang, Yang Wang, Hanhu Cai, Runqi Deng, Shuwen Wang, Jiayu Wu, Shuxin Tan, Junyong Liu</i>	
Optimal Expansion Planning of AC/DC Hybrid System Integrated with VSC Control Strategy.....	3272
<i>Weiting Xu, Ao Li, Yunche Su, Mi Zhu, Xuotong Ouyang, Xinting Yang</i>	
Tech-economic Benefit Evaluation and Decision for Distribution Network Planning Based on Fuzzy Analysis Hierarchical Process.....	3277
<i>Tianyou Li, Zhixuan Liu, Yue Xiang, Junyong Liu, Zhuozhen Jiang, Yang Wang</i>	
Research on Distribution Network Planning Containing Micro-grids	3283
<i>Lei Shen, Xun Xu, Tianqi Zheng, Jingyue Gu</i>	
An Optimal Capacity Planning Method for Multiple Types of Renewable Energy in Combined Operation Considering Different Peak-Shaving Demands	3288
<i>Xi Ye, Xuotong Ouyang, Xi Zhang, Mi Zhu, Weiting Xu</i>	
Automatic Simulation of Active Distribution Network Based on Multi-agent Technology.....	3293
<i>Tianyou Li, Zhixuan Liu, Yanxin Chai, Yue Xiang, Junyong Liu, Zeming Li</i>	
Research on Operation Optimization Method of Regional Integrated Energy System.....	3299
<i>Xiaochen Zhang, Dongmei Yang, Wei Du, Yonghua Chen, Guoxin He</i>	
Explicit Formula Based Reliability Estimation Method for Distribution Feeder.....	3305
<i>Yunche Su, Siqi Cheng, Jun Rong, Weiting Xu, Li Shen, Yunkai Lei, Tianqi Lu, Chiyao Chen</i>	
Multi-scale Modeling and Simulation of CHB Multilevel Converter for EMT-RMS Transients Studies.....	3310
<i>Hua Ye, Yao Liu, Yanan Tang, Yanhong Yang, Wei Pei</i>	
Visualization System Design for Investment and Planning of Active Distribution Networks.....	3316
<i>Zhixuan Liu, Fang Lin, Tianyou Li, Yan Lin, Yanxin Chai, Yue Xiang, Junyong Liu, Lili Zhou</i>	
A Coordinated Charging Strategy on Battery Swapping Station in Microgrid Considering Battery to Grid	3322
<i>Hongwang Yang, Chunlin Guo, Jinwei Ren, Jie Sheng</i>	
Research on Establishment and Method of Performance Evaluation Index System of smart grid Distribution Network	3327
<i>Di Wang, Lin Lv, Jie Tang, Xinda He</i>	

Optimal Scheduling to Improve Load Supply Capability Considering the Integration of Electric Vehicles in Active Distribution System.....	3333
<i>Jun Xiao, You Situ, Weideng Yuan, Jiahui Chen, Hua'an Xie</i>	
Reliability Assessment of High-Medium-Low Voltage Integrated Distribution Network Using Hybrid Method	3339
<i>Lixiong Xu, Junyong Liu, Lanling Wang</i>	
Evaluation of Filtering Function for Grid Connected STATCOM in Wind Power Applications.....	3345
<i>L. Shen, Y. Su, X. Ouyang, M. Zhu, Y. Wang, T. Li, D. Ai</i>	
Research on the Test of Communication Protocol of Power Quality Monitoring Platform.....	3351
<i>Jinhao Wang, Da Lei, Xiaoyang Ma, Honggeng Yang</i>	
Security Co-planning of Generation and Transmission Considering Flexible Facility and High-Penetration Renewable Energy	3358
<i>Chengming Zhang, Shenxi Zhang, Haozhong Cheng, Jianzhong Lu, Zheng Wang, Xiaohu Zhang</i>	
A Combined ARIMA-PPR Model for Short-Term Load Forecasting	3363
<i>Lintao Yang, Honggeng Yang</i>	
Operational Performance and Economic Analysis of Three PV Tracking Technologies in an Australian PV Plant	3368
<i>Junyong Wang, Feifei Bai, Muhammad Hafidz B. Khairudin, Rodney H. G. Tan</i>	
Line Outage Detection and Localization via Synchrophasor Measurement	3373
<i>Xianda Deng, Desong Bian, Di Shi, Wenxuan Yao, Zhihao Jiang, Yilu Liu</i>	
Research on Multi-objective Planning of Active Distribution Network Considering Energy Storage Operation Strategy	3379
<i>Shilong Wang, Xibin Yang, Qinghua Lin, Zhijun Ren, Huimin Wang, Hongxia Guo, Ping Yang</i>	
Short-Term Load Forecasting at Different Aggregation Levels with Predictability Analysis	3385
<i>Yayu Peng, Yishen Wang, Xiao Lu, Haifeng Li, Di Shi, Zhiwei Wang, Jie Li</i>	
Method of Energy Station Capacity Configuration for Residential District-Level Integrated Energy System Considering Virtual Energy Storage	3391
<i>Jiawei Lv, Shenxi Zhang, Haozhong Cheng, Heng Zhang, Kai Yuan, Yi Song, Chongbo Sun</i>	
Identifying Correlation between Planning Strategy and Reliability of Distribution Networks Based on Machine Learning	3396
<i>Yang Wang, Yue Xiang, Junyong Liu, Wei Sun, Zihao Li</i>	
Review of Machine Learning in Power System	3401
<i>Zhibo Ma, Chi Zhang, Chen Qian</i>	

Weaknesses Identification Using Reliability Tracking in Distribution System with Distribution Generation	3407
<i>Jing Pan, Bin Xu, Xiaogang Hou, Lingfeng Kou</i>	
Modular Distribution Network Reliability Analysis and Comprehensive Evaluation Method	3413
<i>Ruoxuan Sun, Mufan Wang, Zaijun Wu, Xiaobo Dou, Yuchao Luo, Jianlong Sun, Liang Cheng, Jian Yuan</i>	
Day-Ahead Reactive Power Optimization Model for Active Distribution Network based on Various Active Management Measurements.....	3419
<i>Xin Ma, Jinsong Liu, Ruipeng Guo, Dewei Xu, Yadi Zhang, Yanping Wang, Zhao Huang</i>	
A Novel Voltage Regulation Strategy for Secure Operation of High Renewable Penetrated Distribution Networks with Different R/X and Topologies	3424
<i>Qian Hu, Siqi Bu, Shiwei Xia, Hui Cai</i>	
Predictive Control of Regional Flexible Load Cluster Based on Mixed Logical Dynamic Method	3430
<i>Guanhong Chen, Dong Liu, Lixia Yan</i>	
Economic Analysis of User-End Grid Connected Energy Storage System Based on the Sensitivity Analysis of Battery Price	3435
<i>Geng Niu, Ming Wu, Lingfeng Kou, Xiaogang Hou, Xiaoyun Qu, Lijing Sun, Yijin Li</i>	
Fuzzy Logic-Based Electric Vehicle Charging Management Considering Charging Urgency	3441
<i>Lidan Chen, Bo Chen</i>	
Priority Rules on the Charging of Electric Vehicles with Energy Storage	3447
<i>Jiangliang Jin, Yunjian Xu</i>	
Power Flow Optimization of Intelligent Distribution Network with Distributed Energy Resources	3452
<i>Xuenan Gu, Xi Xu, Zhipeng Yu, Sujuan Huang, Bin Lu</i>	
Urban Smart Energy System Architecture and Key Technology Analysis.....	3458
<i>Xiaoyun Qu, Lingfeng Kou, Xiaogang Hou, Geng Niu</i>	
An Optimal Dispatch Strategy of Distribution Networks with Electric Vehicle Charging Stations Integrated Energy Storage.....	3462
<i>Jianjun Fan, Shaocong Bi, Hong Yuan, Yuankai Han, Qiongshan Wu, Xiaoyi Liu, Xiao Li</i>	
Long-Term Electric Vehicle Planning in a Microgrid.....	3467
<i>Jean-Michel Clairand, Mariano Arriaga, Mohammad Hasan Ravanji, Guillermo Escriva-Escriva</i>	
Correlation-Based Investment Decision-Making for Distribution Network Reconstruction.....	3473
<i>Yue Xiang, Junyong Liu, Yanxin Chai, Lili Zhou, Shuai Hu</i>	

◆ Artificial Intelligence for Smart Grid and Sustainable Energy Systems

Electrical Equipment Inspection Process Intelligently Tailoring Based on Graph Planning	3479
<i>Jieshan Li, Changhong Zhang</i>	
A Very Short-Term Forecasting Approach for Virtual Power Plant Using a Self-Adaptive Hybrid Algorithm.....	3485
<i>Yu Zhu, Qiuyu Lu, Yinguo Yang, Bo Li, Yingming Lin, Yan Tan, Zhongkai Yi, Kang Wang, Yinliang Xu</i>	
Intelligent Flexible Priority List for Reconfiguration of Microgrid Demands Using Deep Neural Network.....	3490
<i>Ahmed S. Alahmed, Salman U. Taiwo, Mohamed A. Abido, Mohammed M. Almuhamini</i>	
The Applications of XGBoost in Fault Diagnosis of Power Networks	3496
<i>Bo Wang, Ke Yang, Dong Wang, Shao-zhen Chen, Hai-juan Shen</i>	
Multi-angle Analysis and Calculation of Electric Heat Storage Heating Equipment Connected to Distribution Network	3501
<i>Peixian Cong, Weichun Ge, Fujia Zhang, Changlong Yang, Yueyue Li</i>	
Method for Peration Control Obstacle Location and Fault Prediction of Substation Based on Information Driven	3507
<i>Jie Wu, Yufei Teng, Wenxuan Ding, Dongliang Nan, Kaike Wang, Hongshan Zhuang</i>	
Study on the Index System of Windproof Safety Evaluation for Coastal Power Grids.....	3513
<i>Yun Qin, Xianfu Gong, Yang Fan, Hao Yu, Xin Cheng, Yao Duan</i>	
Comparative Analysis of Technology and Economy on Echelon Battery Energy Storage	3519
<i>Bingjie Li, Hu Li, Guojing Liu, Jing Shi, Linyuan Wang, Hongda Zhao</i>	
A Simplified Model Prediction Control Method for PV Grid-Connected Inverter.....	3525
<i>Zhenao Sun, Wei Zheng, Heng Du</i>	
A Novel LSTM Based Deep Learning Approach for Multi-time Scale Electric Vehicles Charging Load Prediction.....	3531
<i>Juncheng Zhu, Zhile Yang, Yan Chang, Yuanjun Guo, Kevin Zhu, Jianhua Zhang</i>	
Reactive Power Compensation and Control Strategy for MMC-STATCOM Doubly-Fed Wind Farm	3537
<i>Lu Tianqi, Wang Youyin, Li Zhanjun, Li Meijun, Xu Weimao, Su Yunche, Cao Zhijian, Zhang Na</i>	
Intelligent Fault Diagnosis of Three-Trans Towers' Bolts Based on EMD and LS-SVM	3543
<i>Xian Wu, Yuan Cai, Ruidong Shi, Yu Wang, Yue Zuo, Xuefang Liu</i>	
Mid Long Term Optimized Dispatching of Virtual Power Plant Based on Weighted Kilowatt Hour Battery Loss Model	3549
<i>Tianqi Lu, Heyan Zhu, Peng Yu, Chuang Yan, Zhe Nan, Xue Xiao, Zheng Gu, Xiao Pan</i>	
Weight Acceleration Based Neural Network Design Method for Energy System State Analysis	3556
<i>Yongheng Pang, Dongsheng Yang, Mingjia Ji, Yueyue Li</i>	

A Short Term Integrated Forecasting Model for the Active Power of Photovoltaic Generation Based on Support Vector Machine Algorithm	3561
<i>Lu Tianqi, Pan Xiao, Xu Yanlu, Cheng Siqi, Li Jiahuan, Song Zhuoran, Li Hua, Yu Peng</i>	
Pre-day Coordinated Optimal Control of Large-Scale Electro-Thermal Internet Based on the Response of Heating Temperature Demand of Thermal Users	3567
<i>Weichun Ge, Ping Li, Siluo Sun, Aimin Liu, Jiajue Li</i>	
Research on Wind Power Prediction Method Based on Convolutional Neural Network and Genetic Algorithm	3573
<i>Gang Chen, Zhenyu Li, Dan Yang Li, Chenqi Wang, Chengwei Li, Zhe Zhou, Xin Wang, Zhenyu Li, Ji Jun Hao</i>	
Dispatching Strategy of Combined Heat and Power System Based on Additional Heat Source for Wind Power Accommodation.....	3579
<i>Weichun Ge, Tao Wang, Jing Gao, Yihe Wang, Yanfeng Ge, Kang Liu, Bonan Huang</i>	
Abnormal Electricity Consumption Detection from Incomplete Records in Power System	3584
<i>Yang Zhang, Pietro Colella, Andrea Mazza, Ettore Bompard, Emiliano Roggero, Giuliana Galofaro</i>	
Research of Fault Diagnosis and Location of Power Transformer Based on Convolutional Neural Network	3589
<i>Jia Qin, Bowen Zhou, Ziheng Mi</i>	
✦ Big Data Analytics, Modern Artificial Intelligence and Advanced Optimization Technologies in Power and Integrated Energy Systems	
Analysis on Complaint Behavior of Electric Power Customers	3595
<i>Defu Cai, Wenna Wang, Kun Chen, Kan Cao, Zeyang Tang, Haiguang Liu, Xianjun Ma, Min Xu, Zhenting He</i>	
Prediction of Critical Clearing Time for Transient Stability Based on Ensemble Extreme Learning Machine Regression Model.....	3601
<i>Zhen Chen, Xiaoyan Han, Chengwei Fan, Hua Zhang, Chang Liu</i>	
Hybrid Energy Storage System in Naval Vessel with 2-Stage Power-Sharing Algorithm.....	3607
<i>Kyaw Hein, Yan Xu</i>	
Influence Analysis of Voltage Loss on Similarity Calculation	3613
<i>Zeyang Tang, Xiaodong Yu, Kan Cao, Xin Shu, Bingke Yan, Defu Cai, Li Wan, Kunpeng Zhou, Lei Wan, Jie Xing, Hongyan Zhou</i>	
A Hierarchical Fuzzy Method for Power-Electronic Inverter Evaluation	3618
<i>Kyaw Hein, Yan Xu</i>	
A Method for Identifying Connectivity Relationship in Low-Voltage Area Based on Voltage Big Data	3624
<i>Shuang Wu, Wei Hu, Yu Dong</i>	

Efficient Abnormal Load Identification in Large-Scale Power System employing Rayleigh Quotient Method and Parallel Computing Techniques	3629
<i>Song Han, Hongqian Li</i>	
Detection and Identification of Bad Data Based on Neural Network and K-means Clustering	3634
<i>Tong Zhang, Yi Wang, Jian Ning, Mingyu Zhai</i>	
BIRCH Algorithm and Wasserstein Distance Metric Based Method for Generating Typical Scenarios of Wind Power Outputs.....	3640
<i>Qiushi Li, Xianghua Tang, Changming Chen, Xinyi Liu, Shengyuan Liu, Xiongjie Shi, Hui Liu, Zhong Li, Zhenzhi Lin, Li Yang, Fushuan Wen</i>	
A New Attack Separation Scheme Based on Bilinear State Estimation	3645
<i>Wenli Xue, Huaizhi Wang, Xichang Wen</i>	
Optimal Design of Energy Hubs in an Integrated Energy System Considering Contingencies in Critical Branches	3651
<i>Zihan Lin, Yuan Yan, Fushuan Wen, Ivo Palu, You Xue, Chenbo Xu, Lijun Zhang, Yikai Sun</i>	
Response-Based Adaptive Under-Voltage Load Shedding Using Oblique Energy Decision Tree.....	3657
<i>Lipeng Zhu, Chao Lu, Yonghong Luo</i>	
Investigation on the Accommodation Capability of a Distribution System for Electric Vehicles Considering System Flexibility.....	3663
<i>Qing Deng, Yuanxiang Wang, Fushuan Wen, Weimin Zheng, Pan Dai, Yang Zhang</i>	
Interval State Estimation with Limited PMU against False Data Injection Attack.....	3669
<i>Ting Yang, Huaizhi Wang, Guibin Wang, Hui Jiang</i>	
Resilience Enhancement for a Power System with Electric Vehicles under Extreme Weather Conditions	3674
<i>Fang Yao, Jiawei Wang, Fushuan Wen, Junhua Zhao, Xingyong Zhao, Weijia Liu</i>	
Research on Storage and Processing Method for Renewable Energy Big Data	3680
<i>Tie Li, Junci Tang, Feng Jiang, Xiaopeng Xu, Cheng Li, Tao Ding</i>	
Real-Time Dispatch with Flexible Ramping Products in a Power System with High Penetration of Renewable Energy Generation	3685
<i>Hongji Lin, Qing Deng, Fushuan Wen, Ivo Palu, Jiahua Hu, Li Ma, Shengjiang Peng</i>	
Research on Predicting the Short-Term Output of Photovoltaic (PV) Based on Extreme Learning Machine Model and Improved Similar Day.....	3691
<i>Yongmei Jiang, Yang Yang, Qiuxuan Wu, Xiaoni Chi, Jinzi Miao</i>	
Optimal Operation Strategy for an Integrated Low-Carbon Energy System in Coupled Electricity and Natural Gas Markets.....	3696
<i>Yuan Yan, Zihan Lin, Fushuan Wen, Ivo Palu, Xixiang Chen, Weimin Zheng, Lijun Zhang</i>	

Online Operation of Battery Energy Storage System for Demand Charge Reduction Considering Degradation.....	3702
<i>Zhenhuan Ding, Ziang Zhang, Tianqiao Zhao</i>	
Combined Use of Support Vector Machine and Extreme Gradient Boosting System for Cost Prediction of Ultra High Voltage Transmission Projects	3708
<i>Yuanxiang Wang, Qing Deng, Fushuan Wen, Hongyu Zhou, Fuyan Liu, Xiaoyong Yang</i>	
A General Real-Time OPF Algorithm Using DDPG with Multiple Simulation Platforms	3713
<i>Huanhuan Nie, Ying Chen, Yankan Song, Shaowei Huang</i>	
Data-Driven System-Side Harmonic Impedance Estimation Method for UHVDC Converter Station	3719
<i>Haiwei Xie, Wentao Lv, Shengyuan Liu, Feng Chen, Zhenzhi Lin, Diya Zhou</i>	
Mitigating Multi-stage Cascading Failure by Reinforcement Learning	3724
<i>Yongli Zhu, Chengxi Liu</i>	
Electricity Consumption and Weather Reflect Macro-economic Status.....	3729
<i>Xin Wu, Haotian Chang, Jian Li, Zhenyuan Zhang, Qi Huang</i>	
✦ Complementary and Coordinated Planning, Operation and Control of Multi-energy Systems	
Energy Decomposition of Long and Middle Term Contract in Multi-energy System.....	3735
<i>Yongxi Huang, Xiuli Wang, Wei Zhang, Chunlian Cao</i>	
Capacity Assessment of Flexibility Retrofits for Coal Power Units to Promote Renewable Energy Accommodation ..	3741
<i>Xiaofei Li, Yuehui Huang, Weichun Ge, Huanhuan Luo, Guiping Zhou</i>	
Study of Typical Scenarios of Wind Power Based on Data Dimension Reduction and Affinity Propagation Clustering	3747
<i>Jiachen Li, Lin Ye, Qingzhi Zhai, Ling Dong, Yujie Ding, Pai Li, Yuehui Huang</i>	
Optimal Energy Flow of Integrated Energy System Considering Distributed Energy Resources	3753
<i>Yongjie Zhong, Hongwei Zhou, Xuanjun Zong, Kai Yang, Yonghui Sun</i>	
Complementary Coordinated Dispatch of Multi-energy Systems Considering Power Flexibility Margin.....	3759
<i>Bai Xiao, Zhiwen Xiao, Gangui Yan, Zhuo Jiang, Ling Dong, Maochun Wang, Hongzhi Yang</i>	
Optimization Strategy for Generator Excitation System Adjustment Coefficient Based on High Energy Consumption Load Accessed to the Power Grid	3765
<i>Xiaohe Liang, Zhuang Cai, Kai Zhang, Liang Wang, Tie Li, Dai Cui, Ruojin Li, Xiangwu Yan, Yongsheng Jin</i>	
Short-Term Optimized Operation of Multi-energy Power System Based on Complementary Characteristics of Power Sources.....	3770
<i>Bai Xiao, Jia Zheng, Gangui Yan, Yonggang Shi, Mingxi Jiao, Yao Wang, Ling Dong, Maochun Wang, Hongzhi Yang</i>	

Fusion of Multi-time Section Measurements for State Estimation of Power System.....	3776
<i>Xiaoli Liu, Lei Yao, Xianghui Zeng, Shuaidong Zhang, Muqing Liang, Changhong Deng, Yujie Ding</i>	
A Novel Strategy for Wind-Solar-Hydro Complimentary Real-time Scheduling and Control.....	3782
<i>Hao-Tian Zhang, Haohao Wang, Yujie Ding, Ning Wang</i>	
Design and Implementation of Intelligent Dispatching Operation Strategy Platform for Power Grid with UHV	3788
<i>Li Fucai, Cheng Tao, Guo Qiuting, Qi Yuchen, Hu Wei</i>	
Complementarity Analysis and Evaluation of Renewable Energy Stations Based on Mixed-Copula Model	3793
<i>Jiahao Wan, Quanfu Zheng, Ming Xiao, Xuebin Wang, Hao Su, Donghan Feng</i>	
Integrated Energy Collaborative Optimal Dispatch Considering Energy Flexible Building in Smart Grid	3799
<i>Peiqiang Li, Chengyu Zeng, Zuoyun Tan, Piao Xu, Xuqiong Yang</i>	
Capacity Optimization of Battery Energy Storage System in Multi-energy Complementary System Based on Time Series Simulation Method	3804
<i>Yuehui Huang, Pai Li, Weisheng Wang, Ling Dong</i>	
Research on Cooperative Scheduling Model of Wind-Solar-Thermal Virtual Power Plant Based on Thermal Load Demand Response	3810
<i>Xiuyun Gao, Ying Wang, Feng Zuo, Yan Jiang, Chengzhi Sun, Yimiao Yue, Yan Zhao</i>	
Capacity Co-optimization of Thermal and Battery Energy Storage System in Multi-energy Complementary System	3815
<i>Pai Li, Yuehui Huang, Wannian Qi, Jiatian Gan</i>	
Optimal Planning of Multi-carrier Energy Hub System Using Particle Swarm Optimization	3820
<i>Alaa Farah, Hamdy Hassan, Kenichi Kawabe, Toshiya Nanahara</i>	
Optimal Scheme of Energy Storage System with Wind Power Integration Considering Negative Peak Load Regulation Capacity	3826
<i>Linli Liu, Haichao Cui, Yabo Zhao, Haibo Li, Xiuping Zhang, Xijuan Li</i>	
A Novel Integrated Control Strategy of Multi-micro Source Microgrid	3831
<i>Yannan Dong, Zhiyuan Cai, Henan Dong, Yahong Zheng</i>	
Optimization Operation of Multi-energy Complementary System Based on Interval Model	3837
<i>Li Yuan</i>	
Capacity Allocation Optimization of Components in Regional Integrated Micro-energy System.....	3843
<i>Hui Hui, Mingxin Zhao, Jian Su, Wei Liu</i>	

✦ Risk Assessment and Planning of Power Systems Integrated with High Penetration of Renewable Energies

Comparative Study of Partial Discharge (PD) Signal Characteristics in Insulation Systems Filled with Mineral and Ester Oil.....	3849
<i>Anupam Dixit, Sameera Samarasinghe</i>	
A Power Flow Tracing Based Load Curtailment Technique	3855
<i>Tao Wu, Bo Hu, Kaigui Xie, Heng-Ming Tai, Shuocheng Wang, Bo Li</i>	
Simulation of PV Grid-Connected Inverter Based on PSCAD	3860
<i>Jian Zhang, Fang Lin, Weijun Zhang, Yi Zhang, Zhengxin Ruan</i>	
Estimation of Offshore Wind Farm Reliability Considering Wake Effect and Wind Turbine Failure	3866
<i>Angshu Plavan Nath, Santanu Paul, Zakir Hussain Rather, Sadhan Mahapatra</i>	
Interval Electrical Betweenness Method for Power Grid Vulnerability Assessment Considering Wind Power.....	3872
<i>Lijuan Li, Zhiqiang Liu, Mao Tan, Yuan Li, Jian Zhou, Jun Wu</i>	

✦ Power Electronic Interface for Smart DC Microgrids

Circulating Current Control for Hybrid MMCs under DC Voltage Sag.....	3878
<i>Pengfei Hu, Jie Guo, Rui Yin, Qian Xiao, Yi Du</i>	
AC Side Impedance Modeling of Grid-Tied Modular Multilevel Converter Using Double Closed Loop Control Strategy	3884
<i>Cheng Zeng, Xiong Du, Jun Zhang, Chengmao Du</i>	
Interleaved Hybrid Boost Converter with Switched Capacitor Technique.....	3890
<i>Mahadevan Bhaskar, Girish Ganesan R, Narayanan K</i>	
Design and Implementation of Droop Control Strategy for DC Microgrid Based on Multiple DC/DC Converters	3896
<i>Yuxiong Liu, Yang Han, Chengjia Lin, Ping Yang, Congling Wang</i>	
Switched Capacitor Based Multilevel Boost Inverter for Smart Grid Applications	3902
<i>Girish Ganesan R, Raghuram Shankar, Mahadevan Bhaskar, Narayanan K</i>	
A New Distributed Control Strategy for DC Microgrids with Droop Coefficient Correction and DC Bus Voltage Restoration.....	3908
<i>Luqiao Li, Yang Han, Ping Yang, Qi Huang, Zhenyuan Zhang, Yan Xu</i>	
Simulation and Analysis of Multilevel DC Transformer Using Different Dual-Active-Bridge DCDC Converter Models	3914
<i>Yanhui Qin, Kaike Wang, Zhendong Tan, Yue Xia, Ying Chen, Yankan Song</i>	

A Three-Phase Hybrid Four-Level Rectifier	3920
<i>Jianfei Chen, Fujin Deng, Qian Heng, Caisheng Wang</i>	
Preliminary Experiments of a Cryogenic Boost Chopper Based on Low-Resistance MOSFETs and Zero-Resistance ReBCO Inductor under 77K.....	3925
<i>Yu Chen, Jia Lei Wang, Hua Yu Gou, Kang Hong, Ming Shun Zhang, Shan Jiang, Xiao Yuan Chen</i>	
A Three-Phase Four-Level Rectifier with Reduced Component Count	3930
<i>Jianfei Chen, Fujin Deng, Qiang Yu, Yulin Zhong</i>	
◆ Challenges and Solutions for Industrial Applications of Probabilistic Analysis	
Transformer Apparent Age Estimation Based on Probabilistic Health Index.....	3936
<i>Shuaibing Li, Haiying Dong</i>	
Comparison on Three Unscented Transformation Methods for Solving Probabilistic Load Flow.....	3941
<i>Sui Peng, Xi Pang, Huixiang Chen, Xingyu Lin, Yong Lin, Zhengmin Zuo, Hao Yu, Junjie Tang</i>	
◆ Bio-Inspired Algorithms for Energy Management in Smart Grid	
Nonlinear Power Flow Calculation of Offshore Oilfield Power Grid Based on Improved PSO Algorithm.....	3947
<i>Yansong Wang, ZhiQiang Lu, Qiang Li</i>	
◆ Smart Grid Resiliency	
Planning of Distributed Energy Resources in Singapore	3953
<i>Dhivya Sampath Kumar, Hamimah Binte Ahmad Jefri, Anurag Sharma, Wai Lok Woo</i>	
Robust Islanding Identification Technique for Single DG Distribution Networks and Rank Based Load Shedding.....	3959
<i>Narayanan. K, Girish Ganesan. R, Mahadevan. B, Shahbaz A.Siddiqui, Manoj Fozdar</i>	
Study of Smart Condition Monitoring using Deep Neural Networks with Dropouts and Cross-Validation.....	3965
<i>Hwee Fang Cindy Tan, Wai Lok Woo, Anurag Sharma, T. Logenthiran, D. S. Kumar</i>	
Predicting the Damage of Distribution System by Strong Wind	3970
<i>Seongmun Oh, Jaesung Jung, Fauzan Hanif Jufri, Min-Hee Choi</i>	
An Implementation Evaluation Method of Demand Response considering Secondary Peak Effect	3975
<i>Shihai Yang, Feng Ji, Xiaodong Cao, Hongwei Shen, Li Huang</i>	
Framework for Computationally Efficient Outage Detection	3980
<i>Nihith Koundinya. SPVS, Vignesh. S, Sowmya. R, Girish Ganesan. R, Narayanan. K</i>	
A Method to Forecast Storm-Caused Distribution Grid Damages Using Cost-Sensitive Regression Algorithm	3986
<i>Fauzan Hanif Jufri, Seongmun Oh, Jaesung Jung, Min-Hee Choi</i>	

New Performance Indicators for Evaluating the Power System Static Security with STATCOM/BESS	3991
<i>Huimin Wang, Qi Huang, Zhaojun Li</i>	
Load Shedding Method of Power Restoration of Distribution Network Based on SOP.....	3997
<i>Zhigang Xie, Bei Han, Guojie Li, Chenbo Xu, Caiming Jiang</i>	
A Reliability-Based DG Planning Method against Ice Storm Weather	4002
<i>Chaofan Lin, Di Fang, Zhaohong Bie, Liang Gao</i>	
A Review of Smart Grid Restoration to Enhance Cyber-Physical System Resilience.....	4008
<i>Hamed Haggi, Reza Roofegari Nejad, Meng Song, Wei Sun</i>	
Positive Sequence Modeling of AC Drive Systems with Power Interruption Ride-Through Capability in DigSILENT ...	4014
<i>Salish Maharjan, Ashwin M. Khambadkone, Rahul Bhujade</i>	
 ◆ Ancillary Services Provided by Wind Power	
Improvement of Fault Ride through Capability of DFIG-Based Wind Turbine Systems Using Superconducting Fault Current Limiter.....	4019
<i>Muhammad Sarwar, Babar Hussain, Asad Hussain, Muhammad Abubakar</i>	
Wind Power Fluctuation Smoothing with BESS Considering Ultra-Short-Term Prediction.....	4025
<i>Yawen Zhao, Xiaohan Shi, Boxi Zhou, Xiaolei Wang</i>	
Reactive Power Optimization of Wind Farm Considering Reactive Power Regulation Capacity of Wind Generators	4031
<i>Ying Wang, Tao Wang, Kunpeng Zhou, Kan Cao, Daifu Cai, Haiguang Liu, Chu Zhou</i>	
A Fast Frequency Control Strategy for Deloaded WTG in the Power System with High Penetration of Renewable Energy	4036
<i>Jiixin Hu, Chong Shao, Weizhou Wang, Guoyi Xu, Caihong Dong, Tianshu Bi</i>	
Pitch Control Strategy of Permanent Magnet Synchronous Wind Turbine Generator in Response to Cluster Auto Generation Control Command.....	4042
<i>Yang Cui, Peng Zeng, Cheng-wei Cui</i>	
 ◆ Uncertainty Handling Techniques for Smart Grid	
Smart Substation Secondary Equipment Defect Diagnosis Method Based on Information Flow	4048
<i>Wenyue Zhou, Yongkang Zheng, Mingzhong Liu, Xuanwen Ding, Xin Zhu, Xia Li</i>	
Optimal Energy Management of Vanadium Redox Flow Batteries Energy Storage System for Frequency Regulation and Peak Shaving in an Islanded Microgrid	4053
<i>Hao Quan, Jin Kun Teo, Anupam Trivedi, Dipti Srinivasan</i>	

Uncertainty Handling in Electricity Market Operations	4059
<i>M Saboor-UI-Haseena, Pranjal Pragma Verma, Wenjie Zhang, Hao Quan, Dipti Srinivasan</i>	
Non-Intrusive Load Monitoring using Feed Forward Neural Network	4065
<i>Dhivya Sampath Kumar, K. L. Low, Anurag Sharma, Wai Lok Woo</i>	
Isolated Microgrid Capacity Configuration Considering Economic Risk of Customer Interruption	4070
<i>Junpeng Zhu, Yi Zheng, Yaqi Wang, Yue Yuan</i>	
Layered Real-Time Optimization and Coordinated Control of Active Distribution Network Considering Distributed Generation	4074
<i>Yunsong Yan, Mingcai Kang, Junfang Zhang, Zhou Xu, Ying Liu</i>	
Probabilistic Load Flow Using an Improved Point Estimate Method Considering Wind Generation	4080
<i>Yulong Che, Xiaoqin Lv, Xiaoru Wang, Jianyun Liu, Yu Zhang</i>	
Short-Term Load Forecasting Approach with SVM and Similar Days Based on United Data Mining Technology	4086
<i>Xuna Liu, Wentao Zhang, Shengyong Ye, Yuqi Han</i>	
A Novel Method of Contingency Screening and Ranking in Distribution Network Based on PMU	4091
<i>Shuxin Tian, Kunpeng Li, Yang Fu, Shurong Wei, Ping Ling, Shu Liu</i>	
Centralized Demand Response Framework of an Aggregator under Uncertainty.....	4096
<i>P. B. S. Kiran, Naran M Pindoriya</i>	
Research on Intelligent Transient Information Monitoring Technology for Overhead Line.....	4102
<i>Zhao Liang, Zhu Jian, Liu Hua</i>	
Price Setting of a Microgrid Operator in a Radial Distribution Network	4106
<i>P. B. S. Kiran, Naran Pindoriya</i>	
Distributed Interactive Reactive Power and Voltage Control for AC/DC Hybrid Distribution Network	4112
<i>Wei Liu, Jianbin You, Minghui Yin, Hucheng Li, Liudong Zhang, Chaoming Wang</i>	
Harmonic and Magnetic Leakage from Wireless Charging System for Electric Vehicles	4117
<i>Feng Wen, Qiang Li, Rui Li, Li Liu, Tao Wu</i>	
Cost-Effective Energy Management of Grid-Connected PV and BESS: A Case Study	4122
<i>Sachinkumar Suthar, Nitish Kumar, Naran M. Pindoriya</i>	
Research on Harmonic Influence of Electric Vehicle Wireless Charging System on Power Grid	4128
<i>Feng Wen, Qiang Li, Li Liu, Rui Li, Tao Wu</i>	

✦ Machine Learning and Its Applications to Power Systems

Wind Turbine Generator Fault Detection Based on Multi-layer Neural Network and Random Forest Algorithm	4132
<i>Xiangwu Yan, Yongsheng Jin, Yun Xu, Ruojin Li</i>	
Research on the Transformer Area Recognition Method Based on Improved K-Means Clustering Algorithm	4137
<i>Chen Liu, Junping Wang, Meng Wu, Jialing Bai, Xiaohua Wang, Libo Lian</i>	
Deep Learning for Predicting the Operation of Under-Frequency Load Shedding Systems	4142
<i>Youqiang Xiao, Rongzhen Zhao, Yunfeng Wen</i>	
The Analysis of State Estimator Condition Number: A Machine Learning Approach	4148
<i>Xi He, Chunming Tu, Peiqiang Li, Pingjuan Ge</i>	
Analysis of 10kV Non-technical Loss Detection with Data-Driven Approaches	4154
<i>Zheng Wang, Guodong Li, Xudong Wang, Chang Chen, Huan Long</i>	
Day-Ahead Security Constrained Unit Commitment with Controllable Risk	4159
<i>Xin Zhu, Yinhui Shang, Xuan Liu</i>	
Fault Section Location Method Based on Random Forest Algorithm for Distribution Networks with Distribution Generations	4165
<i>Jinquan Zhao, Xue Xia, Dawei Su, Chunlei Xu, Fan Wu</i>	
Isolation Forest Based Detection for False Data Attacks in Power Systems.....	4170
<i>Yufei Song, Zongchao Yu, Xuan Liu, Jianwei Tian, Mu Chen</i>	
Indirect PCA Dimensionality Reduction Based Machine Learning Algorithms for Power System Transient Stability Assessment	4175
<i>Kening Chen</i>	
A Kind of Recommendation Algorithm of Matrix Decomposition Based on Power Grid User Rating Characteristics	4180
<i>Tingting Zeng, Daxing Wang</i>	
Knowledge Acquisition for Transformer Condition Assessment Using Synthetic Minority Over-Sampling Technique and Decision Tree Algorithm.....	4186
<i>Hua Xie, Junxing Chen, Pei Zhang, Fang Zhang, Xiangfei Meng, Jiayu Cheng</i>	
Multi-dimensional Evaluation of Temporal Neural Networks on Solar Irradiance Forecasting	4192
<i>Zhenyu Song, Laura E. Brown</i>	
Method of Static Reactive Power Allocation Considering N-1 Failure Mode and Load Fluctuation.....	4198
<i>Bo Yuan</i>	

BP Neural Network Based Fault Prediction of Distribution Network during Typhoon Disaster	4204
<i>Chen Yu, Kang Chang, Bin Chen, Jiaxin Chen, Yunyun Xie, Gongxin Li</i>	
Research on Minimum Schedulable Power Optimization of CCHP System	4210
<i>K. Zhang, X. R. Li, J. M. Liu</i>	
A Simulation Approach to Multi-station Solar Irradiance Data Considering Temporal Correlations	4215
<i>Xingbo Fu, Feng Gao, Jiang Wu, Ruanming Huang, Yichao Huang, Fei Fei</i>	
Wind Power Prediction Based on the Chaos Theory and the GABP Neural Network	4221
<i>Lina Zhu, Hongtao Shi, Maosheng Ding, Tianji Gao, Zhongnan Jiang</i>	
An Ensemble Machine Learning Based Fault Classification Method for Faults during Power Swing	4225
<i>Dinesh Patil, OD Naidu, Preetham Yalla, Hida S</i>	
The Characteristics Analysis of Controllable Reactor of Transformer Type	4231
<i>GuoSheng Zhao, Pei Li</i>	
Research on Credibility of the Dynamic Simulation of Power Grid Frequency Regulation Based on the Hybrid System Model.....	4235
<i>Qing Liu, Mingkui Wei, Yong Li, Weihua Luo, Qiang Lan, Zhida Su, Xiong Xiao, Song Xiao</i>	
Transformer Fault Diagnosis Using Deep Neural Network.....	4241
<i>Hossein MehdipourPicha, Rui Bo, Haotian Chen, Md Masud Rana, Jie Huang, Fengkai Hu</i>	
✦ Planning, Operation and Control Techniques for Integrated Systems with Distributed Photovoltaic and Cascaded Small-Hydropower Stations	
The Runner Structure Fluid Solid Coupling Research of Bulb Tubular Turbine Based on the Cam Relationship	4246
<i>Sheng-Yang Peng, Zheng-Gui Li, Bo Wang, Xiao-Bing Liu ,Yong-Zhi Zhao, Xiao-Yan Han, Li-Jie Ding, Qing Yang, Hong-Guang Shi</i>	
Research & Prospect of Cascade Hydro-Photovoltaic-Pumped Storage Hybrid Power Generation Technology.....	4252
<i>Liang Wang, Xiaoyan Han, Gang Chen, Lijie Ding, Shumin Miao, Hua Zhang, Xiaoqing Chang, Bin Luo</i>	
An New Method of Photovoltaic Generation Fluctuation Suppression for Cascade Hydro-Photovoltaic-Pumped Storage Generation System.....	4256
<i>Lei Chen, Jun Wang, Fan Wu, Xiaoyan Han, Zhang Sun, Gang Chen</i>	
Feasibility Analysis of Pumped Storage Integration for PV Fluctuation Mitigation	4262
<i>Zhengbo Chen, Xiao Xu, Jichun Liu, Weihao Hu, Junyong Liu, Shaosen Zhou, Hua Zhang, Xiaoyan Han</i>	
The Working Conditions Optimization of Low-Head Water Turbine with Different Guide Vane Outlet Angle	4268
<i>Sheng-Yang Peng, Zheng-Gui Li, Jia-Rong Zhang, Yong-Zhi Zhao, Liang Wang, De-Min Liu, Jian-Ming Yang, Bing-Quan Yang</i>	

Emergency Control for Improving Transient Stability of Integrated Systems with Photovoltaic and Hydropower Stations Based on EEAC Theory	4274
<i>Weitao Chen, Xiangyu Wu, Yin Xu, Jinghan He, Zheng Shi</i>	
An Optimal Operation Method for Cascade Hydro-Photovoltaic-Pumped Storage Hybrid Generation System	4280
<i>Xing Huang, Jun Wang, Sixiong Cheng, Tao Wang</i>	
Microgrids as Electrification Alternatives for the Amazon Region in Ecuador	4286
<i>Jean-Michel Clairand, Hector Chinchero-Villacis, Xavier Serrano-Guerrero, Andres Gonzalez-Zumba</i>	
Application of Vortex Dynamics Diagnosis in Numerical Simulation of Tubular Turbine.....	4292
<i>Dan Yao, Zheng-gui Li, Sheng-yang Peng, Xin-rui Li, Shi-yang Pan, Xian-zhu Wei, Feng-chen Li, Xiao-yan Han, Xue-Ren Wang</i>	
Analysis on Internal Flow Characteristics of Tubular Turbine Draft Tube	4298
<i>Shi-Yang Pan, Zheng-Gui Li, Xin-Rui Li, Xiao-Bing Liu, Yong-Zhi Zhao, Xiao-Yan Han, Xian-zhu Wei, Feng-chen Li</i>	
Optimized Operation of Photovoltaic and Pumped Hydro Storage Hybrid Energy System in the Electricity Market ..	4306
<i>Kai Liu, Weihao Hu, Xiao Xu, Qi Huang, Zhenyuan Zhang, Zhe Chen</i>	
Numerical Analysis of Cavitation Flow in Low Specific Speed Condensate Pump Impeller.....	4312
<i>Chang-Shen Lu, Zheng-Gui Li, Xin-rui Li, Xin Chai, Xiao-bing Liu, Chuan-Qi Ou, Dan Yao, Biao Ma, Wei-Jun Wang</i>	
✦ Research on Key Technologies of Optimization Management and Energy Transaction of the Distributed Resource Under the Electricity-Sold Side Liberalization	
A Novel Pricing Scheme for Peer-to-Peer Energy Trading Based on Evaluation Mechanism in Microgrid	4318
<i>Dan Wang, Pengfei Su, Qi Yang</i>	
✦ Emerging Technologies in Regional Energy Internet	
Virtual Power Plant Model for the Cluster of Household Prosumers Based on Minkowski Sum	4323
<i>Qiu-yu Lu, Yan Tan, Li-juan Duan, Yin-guo Yang</i>	
A Review on Virtual Power Plant Concept, Application and Challenges.....	4328
<i>Xuanyuan Wang, Zhen Liu, Hao Zhang, Yunhao Zhao, Jianlei Shi, Huajie Ding</i>	
Potential Evaluation of Distributed Energy Resources with Affine Arithmetic	4334
<i>Lin Cheng, Ning Qi, Yanfei Guo, Nan Liu, Wei Wei</i>	
Application of AC/DC Distribution Network Technology Based on Flexible Substation in Regional Energy Internet...	4340
<i>Xiaofei Wang, Rui Chen, Jun Ge, Tianzhi Cao, Feng Wang, Xiaolin Mo</i>	
Integrated Demand Response in Multi-energy Market Based on Flexible Loads Classification	4346
<i>Peiyun Liu, Tao Ding, Yuankang He, Tianen Chen</i>	

Virtual Power Plant Optimization Decision Method Considering the Interaction Between Combined Cooling-Heating and Power and Electric Heating Equipment	4351
<i>Honghui Kuang, Shaoqing Guo, Hui Ni</i>	
A Peak Regulation Ancillary Service Optimal Dispatch Method of Virtual Power Plant Based on Reinforcement Learning	4356
<i>Ya Liu, Deliang Zhang, Xuanyuan Wang</i>	
EV Charging Coordination via Blockchain-Based Charging Power Quota Trading	4362
<i>Jian Ping, Sijie Chen, Zheng Yan, Haoran Wang, Liangzhong Yao, Minhui Qian</i>	