

2023 2nd International Conference on Clean Energy Storage and Power Engineering (CESPE 2023)

**Xi'an, China
15-16 December 2023**



**IEEE Catalog Number: CFP23DS5-POD
ISBN: 979-8-3503-9550-1**

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

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

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

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

IEEE Catalog Number:	CFP23DS5-POD
ISBN (Print-On-Demand):	979-8-3503-9550-1
ISBN (Online):	979-8-3503-9549-5

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

2023 2nd International Conference on Clean Energy Storage and Power Engineering (CESPE) **CESPE 2023**

Table of Contents

Message from the General Chairs	ix
Message from the Program Chairs	x
Organizing Committee	xi
Program Committee	xii
Steering Committee	xiii
Reviewers	xiv
Sponsors	xvi

2023 2nd International Conference on Clean Energy Storage and Power Engineering

Research on Fault Diagnosis Method of High Voltage Switchgear Based on LPWAN Multi-Source Information Fusion	1
<i>Qinqin Liang (Guangxi Key Laboratory of Intelligent Control and Maintenance of Power Equipment, China), Bin Tang (Guangxi Key Laboratory of Intelligent Control and Maintenance of Power Equipment, China), Fangyuan Han (Guangxi Key Laboratory of Intelligent Control and Maintenance of Power Equipment, China), Min Yu (Guangxi Key Laboratory of Intelligent Control and Maintenance of Power Equipment, China), Zongchang Luo (Guangxi Key Laboratory of Intelligent Control and Maintenance of Power Equipment, China), Longfei Zhang (Guangxi Key Laboratory of Intelligent Control and Maintenance of Power Equipment, China), Chuansheng Luo (Nanning Power Supply Bureau of Guangxi Power Grid Co., Ltd., China), Mengzhu Hu (Guangxi Key Laboratory of Intelligent Control and Maintenance of Power Equipment, China), Jialin Wang (Guangxi Power Grid Co., Ltd., China), and Liping Zhu (Guangxi Key Laboratory of Intelligent Control and Maintenance of Power Equipment, China)</i>	
Application of System Fusion Principle Based on Entropy and Negative Entropy in the New Energy Power Systems	7
<i>Yong Wang (State Grid Jilin Electric Power Co., LTD., China), Yang Liu (State Grid Jilin Electric Power Co., LTD., China), and Yuwei Wang (State Grid Jilin Electric Power Co., LTD., China)</i>	
Research on Energy Storage Technology of Sodium-ion Batteries & Supercapacitors for Low Speed New Energy Vehicles	13
<i>Dalei Wang (Suzhou University, China), Fei Huang (Suzhou University, China), Biao Li (Suzhou University, China), Baoming Hao (Suzhou University, China), and Wenyi Li (Suzhou University, China)</i>	

Research on Stress Analysis and Energy Saving Measure of Pipeline in Oil Transportation Station Under Non-Uniform Settlement	18
<i>Li Xia (Zhejiang Academy of Special Equipment Science, China), Jia Wu (Zhejiang Academy of Special Equipment Science, China), Zhang Chen (Zhejiang Academy of Special Equipment Science, China), Zhonghe Zhou (Zhejiang Academy of Special Equipment Science, China), Kang Chen (Zhejiang Academy of Special Equipment Science, China), Lintao Xu (Zhejiang Academy of Special Equipment Science, China), and Xiatao Tang (Zhejiang Academy of Special Equipment Science, China)</i>	
3D Point Cloud Segmentation Based Large-Scale Transmission Line Wildfire-Induced Tripping Risk Assessment Technology and Application	24
<i>Jiguang Zhao (Southern Power Grid Digital Grid Technology (Guangdong) Co., Ltd, China), Keying Zhang (Southern Power Grid Digital Grid Technology (Guangdong) Co., Ltd, China), Xinqiao Wu (Southern Power Grid Digital Grid Technology (Guangdong) Co., Ltd, China), Lan Liu (Southern Power Grid Digital Grid Technology (Guangdong) Co., Ltd, China), Ping Qin (Southern Power Grid Digital Grid Technology (Guangdong) Co., Ltd, China), and Mingxiang Lu (Southern Power Grid Digital Grid Technology (Guangdong) Co., Ltd, China)</i>	
Fast Voltage Regulation and Grid Connection Method for Generator-Motor of Vertical Gravity Energy Storage Systems	31
<i>Qingshan Wang (State Grid Jiangsu Electric Power Co., Ltd, China), Yan Li (State Grid Jiangsu Electric Power Co., Ltd, China), Qun Zhang (State Grid Jiangsu Electric Power Co., Ltd, China), Darui He (State Grid Jiangsu Electric Power Co., Ltd, China), and Decheng Wang (State Grid Jiangsu Electric Power Co., Ltd, China)</i>	
Optimal Scheduling of Vehicle-to-Grid Electric Vehicles in Photovoltaic Microgrid	36
<i>Jianfeng Jia (Changchun Institute of Technology, China), Hongbin Sun (Changchun Institute of Technology, China), and Hongyu Zou (Changchun Institute of Technology, China)</i>	
3D Reconstruction of High Voltage Power Cable Tunnel Based on Basic Component Fitting from Point Clouds	41
<i>Yonghen Ai (State Grid Wuhan Power Supply, China), Long Qiu (State Grid Wuhan Power Supply, China), Jianxing Liu (State Grid Wuhan Power Supply, China), Bin Yang (State Grid Wuhan Power Supply, China), and Han Fu (State Grid Wuhan Power Supply, China)</i>	
Nonparametric Analytical Method for Probabilistic Optimal Power Flow in Renewable Energy Distribution Systems Based on Weighted-KNN	45
<i>Xingchen Zong (Zhejiang University, China), Jiandong Si (State Grid Zhejiang Electric Power Co., Ltd. Taizhou Power Supply Company, China), Jian Yang (State Grid Zhejiang Electric Power Co., Ltd. Taizhou Power Supply Company, China), Yunyi Li (Zhejiang University, China), and Xiaoyan Zhang (State Grid Electric Power Research Institute, China)</i>	
Thermal Runaway Simulation of Lithium Iron Phosphate Battery Based on Pyrosim Software ...	52
<i>Yingfeng Huang (North China Electric Power University, China), Yubo Sun (State Grid Fujian Electric Power Company, China), Moyuan Wang (North China Electric Power University, China), Xing Zheng (North China Electric Power University, China), Weiming Liu (State Grid Fujian Electric Power Company, China), Hong Xie (State Grid Fujian Electric Power Company, China), and Chaoqun Lin (State Grid Fujian Electric Power Company, China)</i>	

Research on Charging Infrastructure Related Detection Technology Based on GAN	57
<i>Qingming Lin (State Grid Shanghai Electric Power Company, China; Shanghai Hengnengtai Enterprise Management CO., Ltd., China), Tengfei Li (State Grid Shanghai Electric Power Company, China; Shanghai Hengnengtai Enterprise Management CO., Ltd., China), Yang Zhao (State Grid Shanghai Electric Power Company, China; Shanghai Hengnengtai Enterprise Management CO., Ltd., China), Jianyang Guan (State Grid Shanghai Electric Power Company, China; Shanghai Hengnengtai Enterprise Management CO., Ltd., China), Wenhui Zhang (State Grid Shanghai Electric Power Company, China; Shanghai Hengnengtai Enterprise Management CO., Ltd., China), and Xiaocun Wang (State Grid Shanghai Electric Power Company, China; Shanghai Hengnengtai Enterprise Management CO., Ltd., China)</i>	
An Innovative Electromagnetic Integration Method for LCL Filters in Grid-Connected Inverters	63
<i>Wei Wei (State Grid Ningxia Electric Power Co., Ltd, China), Junxian Ma (State Grid Ningxia Electric Power Co., Ltd, China), Jiaqi Zhao (State Grid Ningxia Electric Power Co., Ltd, China), Yaning Hai (State Grid Ningxia Electric Power Co., Ltd, China), Zongchuan Zhou (State Grid Ningxia Electric Power Co., Ltd, China), and Na Chen (State Grid Ningxia Electric Power Co., Ltd, China)</i>	
Compressed Air Energy Storage in Wind Solar Complementary Systems	69
<i>Yanan Wang (University of Electronic Science and Technology of China, China), Zhen Lei (Guangdong University of Technology, China), and Jiekang Wu (Guangdong University of Technology, China)</i>	
Efficiency Analysis of Solar Energy in Jilin Province Considering Uncertainty Factors	73
<i>Peisheng Gao (State Grid Jilin Electric Power Co., LTD., China), Jiayan Ling (State Grid Jilin Electric Power Co., LTD., China), Boqiang Li (State Grid Jilin Electric Power Co., LTD., China), and Jian Gao (State Grid Jilin Electric Power Co., LTD., China)</i>	
Collaborative Control of Source Storage and Load in Distribution Networks Considering the Capacity of New Energy Consumption	79
<i>Hao Jia (State Grid Xinjiang Electric Power Co., Ltd., China), Xingang Wang (State Grid Xinjiang Electric Power Co., Ltd., China), Xinyu Xu (State Grid Xinjiang Electric Power Co., Ltd., China), and Jiayu Bian (State Grid Xinjiang Electric Power Co., Ltd., China)</i>	
Analytical Method for High-Speed Non-Darcy Seepage Equations Considering the Inertia-turbulence Effect of Natural Gas	85
<i>Zuocai Liao (Karamay Vocational and Technical College, China)</i>	
Low Carbon Economy Dispatch of Integrated Energy Systems Counting Adjustable Loads for Cluster Electric Vehicles	93
<i>Yu Liu (Changchun Institute of Technology, China), Hongbin Sun (Changchun Institute of Technology, China), Hongyu Zou (Changchun Institute of Technology, China), and Jianfeng Jia (Changchun Institute of Technology, China)</i>	
Factor Analysis and Prediction of Carbon Emission in Guangdong Province	99
<i>Shangjiu Wang (Shaoguan University, China), Xueyan Du (Shaoguan University, China), Liang Cheng (Shaoguan University, China), Keqiang Li (Ningbo University of Finance and Economic, China), Peiling Zhang (Shaoguan University, China), and Jiana Xu (Shaoguan University, China)</i>	

Comprehensive Evaluation Model Based on the Internet of Things for Electricity	108
<i>Guanlin Li (Shandong Electric Power Engineering Consulting Institute Corp., Ltd, China) and Jiaxing Shi (Shandong Electric Power Engineering Consulting Institute Corp., Ltd, China)</i>	
Optimization and Energy Consumption Analysis of the Cooling System for Energy Storage Electric Cabinets	115
<i>Yingfeng Huang (State Grid Fujian Electric Power Company, China), Yubo Sun (State Grid Fujian Electric Power Company, China), and Chenhui Jing (North China Electric Power University, China)</i>	
Research on Two-Stage Optimal Dispatching of Active Distribution Network	121
<i>Shuqi Zhao (Northeast Petroleum University, China), Jianjun Xu (Northeast Petroleum University, China), Xuyang Zeng (Northeast Petroleum University, China), and Limei Yan (Northeast Petroleum University, China)</i>	
Analysis of Single-Phase Grounding Fault Based on Internet of Things for 1000 kV	127
<i>Xiangzheng Xu (East China Jiaotong University, China) and Diyu Ao (East China Jiaotong University, China)</i>	
A Hybrid Algorithm Based on Sparrow Search and Crisscross Optimization for Parameters Identification of Modified Jiles-Atherton Model	132
<i>Zihui Chen (Jiangmen Power Supply Bureau of Guangdong Power Grid Co Ltd, China), Xianrong Li (Jiangmen Power Supply Bureau of Guangdong Power Grid Co Ltd, China), Zhiying Wu (Jiangmen Power Supply Bureau of Guangdong Power Grid Co Ltd, China), Ronghuan Mai (Jiangmen Power Supply Bureau of Guangdong Power Grid Co Ltd, China), and Baiping Yan (Guangdong University of Technology, China)</i>	
Implications of Energy Storage Device in Efficient Frequency Control of Multi-Area Power System	139
<i>Hiramani Shukla (IES College of Technology, India), Sonali R. Nandanwar (IES College of Technology, India), N.P. Patidar (MA National Institute of Technology, India), Jalpa Thakkar (UPL University of Sustainable Technology, India), Deva Brinda Deepak (Norwegian Solar India Private Limited, India), and Mohan Lal Kolhe (University of Agder, Norway)</i>	
Distribution Network Fault Location Method Based on Improved Graph Convolutional Neural Network	145
<i>Youjun Wang (State Grid Anhui Electric Power Co., Ltd, China), Qianqian Shi (State Grid Anhui Electric Power Co., Ltd, China), Ya Zhou (State Grid Anhui Electric Power Co., Ltd, China), Lulu Du (State Grid Anhui Electric Power Co., Ltd, China), Yinghua Wu (State Grid Anhui Electric Power Co., Ltd, China), and Fei Lin (State Grid Anhui Electric Power Co., Ltd, China)</i>	
Tri-Stage Optimal Scheduling for Microgrid Cluster Considering Carbon Emissions	151
<i>Yinghua Wu (State Grid Anhui Electric Power Co., Ltd, China), Lulu Du (State Grid Anhui Electric Power Co., Ltd, China), Chengjuan Chu (State Grid Anhui Electric Power Co., Ltd, China), Qianqian Shi (State Grid Anhui Electric Power Co., Ltd, China), Ya Zhou (State Grid Anhui Electric Power Co., Ltd, China), and Fei Lin (State Grid Anhui Electric Power Co., Ltd, China)</i>	
Study on the Influence Law of Adjacent Cavity of Natural Gas Energy Storage in Salt Rock	158
<i>Yingjie Wang (Zhongyuan University of Technology, China), Zhilong Li (Zhongyuan University of Technology, China), and Fuzhou Qi (Zhongyuan University of Technology, China)</i>	

The Optimal Ratio of Wind Light Storage Capacity Considering the Uncertainty of Renewable Energy	168
<i>Xingang Wang (State Grid Xinjiang Electric Power Co., Ltd, China), Zhuan Zhou (State Grid Xinjiang Electric Power Co., Ltd, China), and Zhiyong Yu (State Grid Xinjiang Electric Power Co., Ltd, China)</i>	
Analysis of Energy-Saving Modification Technology of Drying System in Silica Gel Production Process	174
<i>Zezheng Fu (Qingdao University of Technology, China), Xuquan Li (Qingdao University of Technology, China), and Yali Zhang (Qingdao University of Technology, China)</i>	
Smart Grid Power Fault Detection and Safe Transmission Method of UAV Automatic Patrol Inspection	179
<i>Jianfeng Su (Anshun Power Supply Bureau of Guizhou Power Grid Co., Ltd, China), Bixiang He (Anshun Power Supply Bureau of Guizhou Power Grid Co., Ltd, China), Jin Zhang (Anshun Power Supply Bureau of Guizhou Power Grid Co., Ltd, China), Hangkang Yang (Anshun Power Supply Bureau of Guizhou Power Grid Co., Ltd, China), Jingyan Mou (Anshun Power Supply Bureau of Guizhou Power Grid Co., Ltd, China), and Baobao Zeng (Anshun Power Supply Bureau of Guizhou Power Grid Co., Ltd, China)</i>	
Development and Application of a Small Synchronous Generator Excitation Operation Training System	185
<i>Tao Zhou (Guangxi Vocational College of Water Resources and Electric Power, China), Xinting Yan (Guangxi Vocational College of Water Resources and Electric Power, China), Bingsen Chen (Guangxi Vocational College of Water Resources and Electric Power, China), Jianfa Li (Guangxi Vocational College of Water Resources and Electric Power, China), and Huali Hu (Guangxi Vocational College of Water Resources and Electric Power, China)</i>	
Research on Distributed Real-Time Optimal Control Strategy for Micro-Grid	190
<i>Yangqin Ma (Chongqing Vocational College of Public Transportation, China) and Jing Jiang (Chongqing Vocational College of Public Transportation, China)</i>	
Design of ICCP Cathodic Protection System for Offshore Wind Power Jacket	197
<i>Yuhang Pan (Shenzhen CGN Engineering Design Co., Ltd, China), Xianjun Li (Shenzhen CGN Engineering Design Co., Ltd, China), and Guangda Li (Shenzhen CGN Engineering Design Co., Ltd, China)</i>	
Research on Harmonic Suppression Control Strategy for Grid Side Converter	202
<i>Linzhao Hao (Guangdong University of Science and Technology, China), Qiyang Yan (Guangdong University of Science and Technology, China), and Xia Liu (Guangdong University of Science and Technology, China)</i>	
Study on Optimization of Consumption and Delivery Scheme of High-proportion Renewable Energy Grid in Zero-carbon Park Based on Cuckoo Search	207
<i>Zongyuan Wang (State Grid Liaoning Electric Power Supply CO. LTD, China), Tao Jiang (State Grid Liaoning Electric Power Supply CO. LTD, China), Guangshuo Liu (State Grid Liaoning Electric Power Supply CO. LTD, China), Jingwei Hu (State Grid Liaoning Electric Power Supply CO. LTD, China), and Sichen Lu (State Grid Liaoning Electric Power Supply CO. LTD, China)</i>	
Author Index	213