

2025 IEEE 5th New Energy and Energy Storage System Control Summit Forum (NEESSC 2025)

**Hohhot, China
15-17 August 2025**



**IEEE Catalog Number: CFP25UB4-POD
ISBN: 979-8-3315-0123-5**

**Copyright © 2025 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

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

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

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

IEEE Catalog Number:	CFP25UB4-POD
ISBN (Print-On-Demand):	979-8-3315-0123-5
ISBN (Online):	979-8-3315-0122-8

Additional Copies of This Publication Are Available From:

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

Table of Contents

001	The Combined Forecasting Method of Carbon Trading Price in Pilot Carbon Market Based on the Optimal Weighting Method	1
	<i>Zhenyu Wang, Baohua Hu, Jing Xu, Yao Rao, Kui Wang</i>	
002	Research on Photovoltaic Fault Diagnosis Based on Transfer Learning	9
	<i>Wenxin Guo, Liqiang Liu, Yongsheng Qi, Shunli Wang</i>	
003	Improving Transient Stability of Virtual Synchronous Generator-based Grid-forming MMC via Flux Linkage Feedback	14
	<i>Haoheng Li, Haozhe Cui, Yang Liu, Yanqiu Wu</i>	
004	Emergency Restoration Strategy for the Distribution Network Based on Adaptive Meta Spatiotemporal Graph Convolutional Networks	18
	<i>Ruicai Liu, Chen Li, Jie Wang, Jie Ni, Minglun Qin, Chenghao Jiang</i>	
005	A Wind Power Forecasting Method Based on Parallel KAN-iTransformer-LSTM Architecture	23
	<i>Jiajia Fu, Haige Wu, Tianxiao Lan, Zhiyuan Qi</i>	
006	Review of Uncertainty Modeling for Electric Vehicles in Vehicle-to-Grid Interaction	28
	<i>Zhiming Qiao, Haitao Liu, Yang Xia, Junkai Ma, Wenxiao Zhang, Chenchen Yang</i>	
007	Study on Energy Management of Electric-Hydrogen Integrated Energy System Based on SOEC	34
	<i>Peng Dai, Zihao Liao, Ying Yang, Zesong Wang, Xiaoyan Zhang, Wei Wang, Aijun Chen, Ming Li</i>	
008	State-of-Charge Balancing Control Strategy for Grid-Forming Energy Storage System	40
	<i>Tianze Li, Jiafeng Li, Xianzhi Xiong, Zhixuan Li, Yao Yang, Shanhe Yang, Tonghui Wang</i>	
009	Research on the Trading Strategy of VPP in the Power Electricity Market with an Improved Proximal Policy Optimization Method	45
	<i>Yubin He, Kaiting Lai, Tengge Hu, Wei Jiang, Yaping Hu, Yongquan Nie, Dayun Zou, Yiwen Ding</i>	

010	An Optimisation Approach for Reactive Power and Voltage in Distribution Networks Utilising Multi-Agent Deep Reinforcement Learning <i>Jiaqian Zhao, Xiufang Gu</i>	50
011	Line Selection Method of Small Current Grounding System Based on Transient Characteristic Parameters <i>Ziye Huang, Le Wang, Jiyuan Cao, Chen Jin, Zhe Li</i>	57
012	Development of an Automatic Control System for a Booster Transformer in Traction Power Supply Systems <i>Aleksandr Komyakov, Andrey Lavrukhin, Olga Komyakova, Mikhail Nikiforov</i>	63
013	Strain Feature Evolution and Aging Mechanism Analysis of Lithium-Ion Batteries under Long-Term Cycling <i>Shibo Zou, Qian Wang, Jianqiang Kang, Jing Wang, Xiangtian Deng, Haoran Wang</i>	67
014	Coordinated Bidding Decision Model for Battery – Hydrogen Storage in Electricity and Frequency Regulation Markets <i>Rui Zhao, Ruyue Han</i>	73
015	Multi-Objective Distribution Network Source-Grid-Load-Storage Coordinated Planning Model <i>Wentao Lu, Houjing Guo, Baofeng Yang, Peng Wang</i>	78
016	Short-term Voltage Stability Assessment Based on Bayesian Optimized Deep Learning Algorithm <i>Weida Wang, Jifei Wang, Guitao Wang, Zhenting Dong, Baoxin Zhang</i>	85
017	Voluntary Greenhouse Gas Emission Reduction Potential of Offshore Wind Power in China <i>Chaodu Gu, Qing Tong, Sheng Zhou, Jianghui Zhang, Yan He, Yuefeng Guo</i>	90
018	Source – Load Cluster Partitioning Method for Urban Edge Distribution Networks <i>Xiangyi Meng, Peng Wang, Na Zhang</i>	95
019	Improving the Performance of Passivated Contact Crystalline Silicon Solar Cells with NiOx/MoOx as a Composite Hole Transport Layer Using a Novel Annealing <i>Hai Zhang, Xiaoqing Chen, Xiaofei Xu, Dayong Yuan, Yanhao Wang</i>	100

020	Electrochemical-Stress Coupling Model of Silicon-Carbon Anode Lithium-ion Batteries	106
	<i>Weipeng Bai, Jianqiang Kang, Jing V. Wang, Qian Wang</i>	
021	Battery SOH Estimation Using Thermodynamic Parameters and LSTM	111
	<i>Yi Liu, Jing V. Wang, Jianqiang Kang, Qian Wang</i>	
022	DFIG Band-Specific Impedance Reshaping and Wide-Band Oscillation Suppression Based on an Impedance-Decoupling Model	115
	<i>Jiayi Zhou, Lian Suo, Yunmin Wang, Yihe Guo, Yi Ma</i>	
023	Research on Multi-Peak Maximum Power Point Tracking for Photovoltaic Systems Based on RIME and Incremental Conductance Algorithms	121
	<i>Jianxiong Shi, Junmin Zhang</i>	
024	Research on Cooperative Control Strategy of DC Bus of Doubly Fed Induction Generator Wind Turbine Based on Hybrid Energy Storage	127
	<i>Zhenda Han, Chenxu Zhao</i>	
025	Study on Capacity Optimization of Integrated Hydrogen Production and Refueling Station Considering Economic Analysis	135
	<i>Yu Zhuo, Aijun Chen, Keying Feng, Hang Zhang, Sheng Zhang</i>	
026	Research on a Wind - Solar-Hydrogen-Storage Integrated DC Microgrid System with CLLLC Converter Based Voltage Regulation	140
	<i>Jun Chen, Qian Li, Xiaoyan Sun, Zhiyuan Gui</i>	
027	A Optimization-based Planning Approach for Integrating Soft Open Point into Active Distribution Networks Considering Uncertainty and Voltage Sensitivity	145
	<i>Shishi Deng, Xinlei Cai, Pingqing Sun, Quan Lin, Shaobin Lin, Xinchun Chen</i>	
028	Performance Analysis of a Geothermal-Solar Dynamically Matched Power System Integrated with Hydrogen Production and Consumption Modules	151
	<i>Shuntao Hu, Yuan Li, Xinli Lu, Wei Zhang</i>	
029	Review and Prospects of Inertia Demand Assessment and Control Technologies in High-Penetration Renewable Energy Systems	155
	<i>Yang Xia, Haitao Liu, Zhiming Qiao, Wenxiao Zhang, Junkai Ma, Lun Xu</i>	
030	Control-Strategy Characteristics of Grid-Forming/Grid-Following Hybrid Energy-Storage Systems for Frequency Support	162
	<i>Dulin Wang, Lian Suo</i>	

031	Thermal Management of Lithium-Ion Battery Module via CPCM-Fin Hybrid Cooling	167
	<i>Huabin Chen, Jiuyuan Chen, Biao Jin, Shujian Tang, Yinyan Xu, Tong Zhang</i>	
032	An efficient Active Filtering Strategy for Reducing Total Harmonics Distortion in High-Penetration Grid-connected Solar PV System	171
	<i>Atallah Ouai, Abdesslam Ryad Mebarek, Lakhdar Mokrani, Farhad Shahnia</i>	
033	Multi-step Ahead Ultra-Short-Term Wind Power Forecasting Based on Sliding SSA and LSTM Networks	176
	<i>Xin Zhou, Xinyi Yang, Zhenyu Mao, Liang Xiao, Xiaoliang Xu</i>	
034	Optimization of Bidding Strategy in the Spot Market for Power Generators Based on the Risk Strategy Repository	183
	<i>Kaiting Lai, Huijie Gu, Huafeng Zhou, Xiqi He, Guang Ma, Yingchen Li, Genjun Chen, Yuxin Yan</i>	
035	Stability Assessment of Weak Grids with Grid-Forming Device Integration in New Energy Power Stations	189
	<i>Xu Duan, Yuan Wang, Jingyu Li</i>	
036	Transformer Winding Fault Diagnosis Based on Fusion of FRA and IPOA-CNN	194
	<i>Jian Shen, Qing Gu, Jiaying Liu, Lei Peng</i>	
037	Grid-Connected and Off-Grid Switching Strategy Based on Improved Virtual Synchronous Generator	198
	<i>Wenlong Gu, Sufang Wen, Guangchen Liu, Guizhen Tian</i>	
038	PINN-Based Thermal Estimation of Prismatic Lithium-Ion Batteries	203
	<i>Ke Xue, Zhonggui Zhang, Bo Zhang, Qingyang Yuang</i>	
039	GridSage: A Multimodal Large Model for Intelligent Power Fault Diagnosis-Case Studies on Substation Equipment and Electric Meter Calibration Faults	207
	<i>Jinzhi Wang, Zhenfeng Bao, Qinfeng Song, Qiqi Shu, Yanlong Wang, Yu Zhu</i>	
040	An Adaptive Online Detection Method for the Onset of Lithium Plating Based on the ARIMA Model	212
	<i>Kexin Cheng, Maoshu Xu, Sheng Wang, Bangda Wei, Kangli Wang, Kai Jiang</i>	

041	Comparison of Three Different Extraction Method for Stray Inductance of IGBT Power Module	218
	<i>Fuyue Wen, Lei Han, Xu Feng, Huan Zhu, Wenbo Wu, Qicheng Li, Lingyu Liu</i>	
042	Influence of DFIG Modeling on the Sustainable Integration of Wind Turbines into the Power Grid	222
	<i>Boaz Wadawa</i>	
043	Study on Heat Transfer Performance of Staggered Counter-current Cooling Plate for Energy Storage Li-ion Battery	229
	<i>Benjun Xie, Yikun Cao, Shaoping Zhou, Jiang Lan</i>	
044	Design and Application of Multifunctional Vehicle for Installing Distribution Wires	235
	<i>Dongyun Lei, Peng Yin, Jianfeng Bai</i>	
045	Safety Research of Solid-State Battery Based on Active Equalization	243
	<i>Yunhai Hou, Shan Jiang, Ying Zhao</i>	
046	Thermal Simulation Analysis in Lithium-ion Battery Modules during High-rate Discharging Scenarios	247
	<i>Yixiang Ke, Hanbang Chen, Biao Jin, Delin Kong, Jiaji Chen</i>	
047	Numerical Simulation of Tri-layer Symmetric Manifold Cold Plate for Energy Storage Battery	251
	<i>Xiang Li, Shaoping Zhou, Benjun Xie, Jiang Lan</i>	
048	Numerical Investigation on Cooling Performance of Manifold and Serpentine Channels for Energy Storage Batteries: Flow and Thermal	255
	<i>Shaoping Zhou, Wei Zhou, Benjun Xie, Jun Ren</i>	
049	Study on the Characteristics of Sandwich Cooling Energy Storage Li-ion Battery Pack with Manifold Channel Cooling Plates	260
	<i>Bin Ye</i>	
050	Reactive Power Optimization Configuration in Microgrids Based on Particle Swarm Optimization Algorithm	265
	<i>Qun Shi, Lian Suo, Ruyue Han</i>	