

2023 3rd New Energy and Energy Storage System Control Summit Forum (NEESSC 2023)

**Mianyang, China
26-28 September 2023**



**IEEE Catalog Number: CFP23UB4-POD
ISBN: 979-8-3503-0935-5**

**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:	CFP23UB4-POD
ISBN (Print-On-Demand):	979-8-3503-0935-5
ISBN (Online):	979-8-3503-0934-8

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

CURRAN ASSOCIATES INC.
proceedings
.com

Table of Contents

A Deep-Reinforcement-Learning-based Optimal Scheduling for Rural Integrated Energy System Considering the Uncertainties of Renewable Energies and Loads	1
Bi Liu, Jun Liao, Lijia Xu, Qi Huang	
Multi-timescale Coordinated Operation Optimization of Integrated Energy System	7
Lizhi Zhang, Fan Li, Bo Sun, Haiyang Wang	
Large-scale energy storage system structure design and Thermal Flow Field Optimization-A case study	12
Bo Yang, Afang Jing, Xiong Shu	
Optimized High Energy Vibration Environmental for Four-way Joint Lock Nut of Hydraulic Pipeline in Aircraft Energy Storage Systems	17
Qingjie Liu, Guangqiang Huang, Xing Liu, Zhenggang Liu, Dong Xu, Tao Lu	
Operation Strategy and Economic Analysis of Active Peak Regulation “Photovoltaic + Energy Storage” Power Stations	21
Lisha Tian, Xuejian Chang, Xiong Yan, Haoliang Tan	
Research and Design of Solar Energy-Efficient Systems	30
Jian Jin	
Research on Joint Optimization Configuration of Low Carbon Equipment in Comprehensive Energy System Based on Life Cycle Analysis Carbon Emissions and Carbon Trading	35
Ruoxi Geng, Jian Gao, Huiming Xu, Sian Chen, Canjie Wu, Hongbin Xie, Sian Chen	
Research on Optimal Configuration of Park Level Integrated Energy System for Hydrogen Production Based on Wind Power	40
Minghui Yu, Lianhai Yu, Qiangqiang Yu	
Research on energy hub selection and capacity planning considering demand response uncertainty	44
Hao Zhou, Jinxin Fan, Pingliang Zeng, Xiaohui Qin, Baodi Ding, Yuanyuan Zhang	
Optimal Scheduling for Multi-energy System Considering Coupling of Molten Medium Hydrogen Production and Pipeline Energy Storage	48
Xuan Wang, Qianyu Zhao, Shouxiang Wang	
CLLLC resonant converter compound control for optical storage system	53
Chunxue Wen, Shuhui Li, Peng Wang, Jianlin Li	
Tuning Reserve Margins in Long Term Unit Commitment Integrated Generation Expansion Planning to Enhance Capacity Adequacy	58
Lian Cheng, Peng Liu, Dingyi Cheng, Jiwei Zhang, Jilai Yu	
Research on Optimal Configuration of Energy Storage in Microgrid Considering the Reliability of Power Supply for Critical Loads	63
Dianyi Deng, Xiaoliang Tang	
Hydro-Pump/Generator-based Hydrogen-Pressure Energy Storage for Power Grid-Forming Support	67
Hua Ye, Yan Huang, Yingpeng Hao, Shuanglin Miao, Qingquan Qiu, Yan Liang	
Coordinated Planning of Distributed Photovoltaic Stations and Coal-Replacement-Electricity Devices in Electrical Distribution Networks	72
Tianbin Liu, Xiaowei Yu, Xin Tian, Xiangguo Guo, Jinrui Tang, Kui Wang	

A Steel Wire Rope Defect Detection Method for Gantry Crane in Gravity Energy Storage Systems	77
Xuepeng Mou, Zhen Li, Yuxiang Wang, Zhaofeng Zhang, Dongjunming Yang, Jiahao Wu	
A node importance evaluation method based on Monte Carlo simulation and VIKOR for grids containing new energy	81
Jian Li, Yusong Lin, Qingyu Su	
A New Integrated Locational Marginal Price Based on the Node Carbon Emission Intensity	86
Xirui Xu, Jie Yu	
Effect of multi-energy storage systems on improving the synergy of integrated energy system	90
Delong Zhang, Mingxing Du, Ziyang Zhang, Ji Li, Chao Li, Hongli Liu, Lei Shao	
Renewable Energy Environmental Economic Dispatch Based on Fractional-order Multi-objective Differential Evolution Algorithm Subtitle as needed	94
Hanhao Guo, Guojiang Xiong	
Optimization Configuration Method for Capacity of Photovoltaic Energy Storage System in Urban Rail Transit Based on Demand Response	99
Ai Li, Zhifang Ma	
HAST test of electrical connectors for electronic control systems of new energy vehicles	103
Ziwei Li, Xiaolu Li, Mengna Wang, Bin Suo	
Primary Frequency Regulation Strategy for Combined Wind-storage System Based on Improved Virtual Inertia Integrated Control	110
Xuehao Zhao, Jiguang Wu, Liping Guo, Shaobo Wang, Dezheng Zhao	
Research on Combined Frequency Modulation Strategy of Wind Turbines and Storage System	116
Xiaoyu Han, Shunqing Qiao, Min Xie, Yujia Kang, Yijun Liu, Guizhen Tian	
Optimization of Energy Storage Controller Parameters to Suppress Low-frequency Oscillation of High-proportion Wind-solar Access System	121
Yanan Lu, Tao Xu, Zenan Liu, Boyu Hua, Xiaoxu Wang	
Primary frequency control of flywheel energy storage assisted wind farms	126
Du Jin, Guangchen Liu, Hangyu Yang	
Control Strategy of Flywheel Energy Storage Machine-Side Converter based on Three Vector Model Predictive Torque Control	132
Hangyu Yang, Guangchen Liu, Guizhen Tian, Du Jin	
Research on PV Maximum Power Tracking Based on IMA	139
Lei Zhao, Sufang Wen	
Research on Multi-modal Wind-solar Coupling Hydrogen Production Intra-day Energy Management Strategy	144
Wenhao Wang, Wanhui Ju, Jian Chen, Chenzhi Fang, Bin He	
Optimal Scheduling of Integrated Energy System Considering Demand Response of Multiple Controllable Loads	150
Wenting Dong, Na Zhang, Lanna Du, Yu Liu	
Cost Analysis of Multi-scenario Shared Energy Storage Considering Operational Life Conditions	155
Jizhong Chen, Shuili Yang, Tao Yan, Xiao Chang, Min Zhang, Kaifeng Wang, Jun Zhao	

Research on Hybrid Energy Storage Fluctuation Suppression Based on PI Control	163
Xueqiang Liu, Huaizhong Yun, Jian Cui, Xusheng Wang, Li Ma, Yan Jia	
SOC Balancing Control Strategy Based on Improved Adaptive Current Distribution Coefficient Algorithm for Multi-energy Storage Units in DC Microgrid	169
Shunqing Qiao, Xiaoyu Han, Yujia Kang, Min Xie, Yijun Liu, Du Jin, Guizhen Tian	
SOC Online Estimation Error Correction Algorithm Based on Particle Swarm Optimization Particle Filter Algorithm	174
Qiao Lin, Donglei Liu, Shunlin Wang, Weijia Xiao	
A novel state-of-health prediction method based on Bi-directional Long Short-term memory network by Random Walk Grey Wolf Optimization	180
Haofan Wang, Jing Sun, Qianchun Zhai, Chaoqun Fan	
Condition Partition and Recognition of SOFC System Based on Fusion Clustering	186
Xiaolong Wu, Shiyun Cai, Yu Li, Guohao Yuan, Mingru Zeng, Juan Mei	
Real time operation data mining algorithm for power systems based on adaptive incremental clustering algorithm	191
Wei Zhang, Xiaoya Pang, Jianfeng Zhang, Shuiting Du	
A kind of variable pitch control of wind turbine based on fuzzy control under extreme wind conditions	195
Xuxin Yue, Zhaobing Cai, Zhan Luo, Xiaotong Li, RuiBo Liu, Finglei Zhu	
A Precise Prediction Model Tool for Distribution Network Reliability Indicators Based on Big Data and Multi method Integration	199
Wei Xiao, Yuanxiang Li, Jingyu Zhang, Wei Zhang, Qian Wu	
Research on Fault Diagnosis Method of Grounding Grid Based on WDA-uVOL	206
Zhangpeng Zhou, Guoqiang Ma, Bo Liu, Xu Chu, Shaoshuai Yu	
Design of a piezoelectric-electromagnetic hybrid energy harvester and power collection for railway monitoring	210
Bin Zhang, Wei Sun, Xiang Li, Keshu Qi, Yangang Wang, Jiawei Zhang	
Adaptability assessment method of AC/DC distribution network with high percentage of new energy sources	215
Luyang Wang, Qianyu Zhao, Shouxiang Wang	
Drawing and Application of Distribution Map of Wind Region in Inner Mongolia Power Grid	219
Jiankun Zhao, Kaiyue An, Chujun Fu, Chunxu Qin	
Decentralized Transmission Network Expansion Planning Considering Carbon Trading	223
Biao Jiang, Jia Liu, Pingliang Zeng, Yuanyuan Zhang, Xiaohui Qin, Baodi Ding	
Resilience Enhancement Strategies Based on Fault Repair Schemes in Distribution Network Considering Uncertainty of Traffic Network	228
Xujun Zhang, Diangang Hu, Yong Yang, Haoming Niu	
Robust Economic Dispatch of Micro-energy Networks Considering the Uncertainties of Loads and Photovoltaic Output	233
Jialin Zhou, Jizhong Zhu, Hanjiang Dong, Di Zhang, Hong Li, Zhaoyang Dong	
Parameter identification of DFIG model based on HHT marginal spectrum	239
Zihao He, Jizhong Zhu, Chongjiang Lu, Yanjiang Li, Linying Huang, Yixi Chen	

Stability Estimation and Enhanced Control of BDFIG-Driven Wind Turbines under Weak Grid	243
Yuanzhuo Wang, Hailiang Xu, Pingjuan Ge, Chao Wang	
Microgrid Reliability Assessment Considering Frequency Response Characteristics	250
Xiao Ma, Yue Wang	
Design and Analysis of Backstepping Controller with DC Suppression Loop for Flexible Arc Suppression System in Distribution Networks	255
Yaohui Jiao, Moufa Guo, Zeyin Zheng, Cui Hong	
Transient Stability Analysis and Enhancement for BDFIG Based Virtual Synchronous Control	259
Chao Wang, Hailiang Xu, Pingjuan Ge, Renxiang Fei	
Microgrid-Distribution Network Bi-layer Economic Optimal Dispatch Considering Source-network-load-storage Collaboration	264
Wanting Zheng, Qianyu Zhao, Shouxiang Wang	
Haze Removal for UAV Power Line Asset Inspections using Light-weight Network	269
Fei Tan, Xiaoyuan Yu	
Research on the development and detection technology of CAN interface chip suitable for relay protection devices	273
Yifan Zhang, Wen Shi, Tianqi Hang, Xiaoli Zhang, Wei Li, Qiang Han	
Inertia and Damping Adaptive Control Based on Bifurcation Analysis and Neural Network	277
Meiling Ma, Xinru Chen, Zhuoxin Lu	
Key Node Selection and Network Simplification Method for Distribution Network with High Penetration of Distributed Photovoltaics	281
Hongwang Yu, Yuanyuan Chai, Tianlong Liang, Yifu Wen, Xiaobo Zhao, Yichao Dong	
Development of cable impedance spectrum measurement system based on symmetrical balanced bridge	285
Xuhu Ren, Xiaoyang Zhang	
Optimal Planning of the Slow Charging Infrastructure Capacity for Urban Areas with Load Forecasting	290
Ri En, Xiaojiao Fan, Ri Hai, Genzhula Meng, Wei Wang	
Attention-based convolutional neural network-long short-term memory network wind power forecasting	294
Limin Zhou, Renxiang Lu	
An Imitation Learning-based Approach for Power System Transient Stability Emergency Control	298
Chuchu Xie, Jizhong Zhu, Yixi Chen	
Coordinated optimization Method for Distribution Areas Considering User Willingness and Regulation Cost	303
Yang Wang, Rui Qian, Hao Bai, Yongxiang Cai, Wei Li, Xiaomeng He	
Analysis and promotion of multi-source ship shore power system based on prospect theory	307
Hui Chen, Yapin Gong, Shuaijun Wang, Di Zhang, Yanxin Zhang, Shu Wu, Quan Shi	

A Method for Achieving Decoupling and Interoperability of Edge-Terminal Interaction in Distribution Internet of Things	311
Jiabei Ge, Junyi Li	
Coordinated Restoration Strategy for Extreme Events in Traffic and Power Distribution Networks Considering Road Traffic Flow	315
Chuanzheng Wang, Wei Tang, Yongxiang Cai, Bo Zhang, Lu Zhang	
Design Optimisation of a Magnetic Coupler for Wireless Power Transfer for Electric Vehicles	320
Wei Tian, Chaofei Ma, Chi Yang, Yuan Lv, Jie Zou, Lei Wang, Chunyuan Yang	
Cleaning and Reconstruction of Wind Power Anomaly Data based on Hierarchical Clustering	327
Yanqi Wu, Jingxia Liu, Ziyu Ren, Peihong Yang, Baoli Li	
Short-term wind power prediction based on EVMD-SSA-LSSVM Model	333
Shengpeng Sang, Kaiming Shi, Kai Li, Ruiming Ma	
Distribution Network Reconstruction Strategy with Demand-Side Response Incorporating Energy Storage and Flexible Multi-State Switches	338
Rulei Han, Chao Wang, Minfu A, Yuqiang Wang	
Level Approximation Algorithm for RMVSC Based on Double Weighting Factors	344
Xiangyue Han, Zhenpeng Luo, Baofeng Yang	
Research on EV Schedulable Capability Prediction Method Based on Data-model Hybrid Drive	348
Zijian Guo, Wenyi Li	
Electric Vehicle Charging Load Forecasting Model Considering Users' Travel Rules	353
Chenyang Liang, Wenyi Li	
An improved robust function correction-adaptive extended kalman filtering algorithm for SOC estimation of lithium-ion batteries	358
Chenyu Zhu, Shunli Wang, Chunmei Yu, Nan Hai, Carlos Fernandez, Zhenhua Sun	
An Improved Bidirectional Gate Recurrent Unit Combined with Smoothing Filter Algorithm for State of Energy Estimation of Lithium-ion Batteries	363
Fan Wu, Shunli Wang, Donglei Liu, Wen Cao, Carlos Fernandez	
An improved genetic-backpropagation neural network for state of charge estimation of lithium-ion batteries	369
Shunli Wang, Nan Hai, Jiangnan Yang, Carlos Fernandez	
A Novel Adaptive Forgetting Factor Recursive Least Squares-Extended Kalman Filter Algorithm for Energy State Estimation of Decommissioned Power Lithium-ion Batteries	373
Donglei Liu, Shunli Wang, Yangtao Wang, Yongcun Fan, Yawen Liang, Fan Wu	
Numerical Study of Combined Heat Pipe and Water Cooling for Battery Pack Cooling	378
Zhuo Liu, Hongxia Zhao	
Early Anomaly Detection of Power Battery Based on Time-series Features	383
Heng Li, Zhijun Liu, Xiaolong Chen, Wei Yuan, Muaaz Bin Kaleem, Weirong Liu	
Ultra-High Sensitivity Thin Film Heat Flux Sensor for Battery Thermal Runaway Monitoring	389
Hao Chen, Aiqiang Hou, Yong Wang, Bo Dai	

A Fault Diagnosis And Mechanism Identification Approach for Micro-short of Power Lithium Iron Phosphate Battery	395
Chao Wu, Kaixin Zhang, Chao Wang, Yahao Song, Shuyang Lv	
Parameter Identification of Distribution Line Based on Noise Adaptive Kalman Filtering	400
Guoqiang Zu, Xu Huang, Cuicui Jin, Qi Ding, Ying Yao, Wenwen Ji	
A High-Precision SOC Estimation Method for Lithium-ion Batteries Based on Induced Ordered Weighted Averaging Operator Algorithm	408
Hansheng Zhang, Mengyun Zhang, Shunli Wang, Jingxuan Zhang	
Comparison and optimization of an air cooling design for lithium-ion battery packs by using an electrochemical-thermal coupled model	412
Zhuomin Zhou, Jian Liang, Aiqin Yu, Zhengbin Qin, Haotian Liu, Yanchao Sheng, Wei Guo	
Lithium-ion Battery SOC Estimation by Integrating Electrochemical Model with Deep Learning	418
Fengbin Wang, Hui Pang, Jiahao Liu, Kaiqiang Chen, Wenzhi Nan	
A Review of Parameterization Methods for the Electrochemical Model of Lithium-ion Battery	423
Jingrong Wang, Jinhao Meng, Qiao Peng, Tianqi Liu, Yongxiang Cai, Yang Wang, Shunli Wang	
Analysis of the Impact of Low-frequency AC Transmission on the Performance of Key Transmission and Transformation Equipment	428
Haofan Lin, Hua Xu, Li Liu, Ziao Yin, Hechen Liu	
Identification Method of Substation Meter Readings and Dial Information Based on YOLO-E and OCRNet Image Segmentation	432
Weida Zhao, Haiwen Chen, Xiangqian Yan, Xiaoming Pan, Lingjie Wu, Zhiqing Sun	
Dynamic Equivalence Modeling of Wind-thermal-bundled Power Transmission Through VSC-HVDC System Based on Trajectory Piecewise Linearization	436
You Situ, Hongyun Fei, Jun Xiao, Yuxun Wang, Anping Huang, Duange Guo	
Improved Strategy for Initial Point Generation of Intelligent Algorithm for Battery Operation Optimization in Microgrid System	440
Weidong Chen, Zhiyang Yao, Yingquan Ye, Min Guo, Qingren Jin	
Research on Simulation Alternative Methods for Areva Valve Based Electronic Equipment	444
Junda Qin, Jin Liu, Tianshu Sun, Lin Zheng, Ersong Chen	
Monitoring method of photovoltaic panel parameters	448
Zetian Gao, Yuan Wang, Dong Dou	
Simulation study of transient overvoltage at HVDC transmission terminal	452
Zhiyuan Lu, Hai Jin, Hongliang Zhang, Hong Wang, Xiang Li, Zhiying Ma	
Maximum Value Calculation and Linear Approximation of DC Fault Current of a Single MMC Before Blocking	456
Le Wang, Liangliang Hao, Zhuoya Wang, Jinghan He, Zhengguang Chen	
Optimal Design of Zinc-iron Liquid Flow Battery Based on Flow Control	463
Yukun Xie, Li Ma, Xusheng Wang, Jian Cui, Yan Jia	
Internal Temperature Estimation of Power Lithium Batteries Based on GA-EKF Algorithm	468
Ziyang Liu, Lixin Tian, Xianchao Cheng, Yuan Zhang	

Virtual Synchronous Generator Control Strategy Based on Matrix Converter	473
Huidong Wang, Jianwei Zhang, Guangchen Liu	
Study on Pollution Accumulation Characteristics of Composite Insulators in Transmission Lines	478
Chunxu Qin, Jiafeng Shang, Yongxiang Huang, Chuanqiang Che, Baofeng Yan	
Research on the Short-Circuit Current of MMC-HVDC under DC Pole-to-pole Fault Considering the Impacts of DFIG	482
Zonglong Li, Ge Bai, Jian Hu, Hongbo Chen, Xiaofu Xiong	
AC Fault Ride-through Control Strategy and Fault Characteristics Analysis of AC / DC System Based on MMC-MTDC	487
Jiaxing Li, Bingyuan Yang, Bo Xie, Yaguang Zhang	
Reinjection Five Level Current Source Converters for Individual Parallel-bridge Power Decoupling	492
Rixing He, Baofeng Yang, Huan Liang, Handong Chen, Zhenpeng Luo	
Aging path analysis of batteries under different energy storage operating conditions	497
Kaifeng Wang, Jun Zhao, Jizhong Chen, Min Zhang, Tao Yan, Xiao Chang	
Temperature simulation and analysis of power battery module with PCM	506
Jiaji Chen, Ruizhe Lin, Biao Jin, Julong Jin	
Network-side voltage sag source location method based on limited monitoring point data	510
Le Yang, Yongzhi Su, Xuan Zhang, Haoran Lin, Chongfeng Tian, Jinglei Fu, Hao Li, Haochuan Niu	
Research on Fault Diagnosis Based on Wide Narrow Convolutions Network	515
Qiyue Huang, Jianwei Shen, Yichao Shen, Liheng Ying	
An Improved Adaptive Velocity Update Particle Swarm Optimization Algorithm for Parameter Identification of Lithium-ion Battery	519
Junfei Xiang, Donglei Liu, Shunli Wang, Fan Wu	
Analysis of Turn-to-turn Short Circuit Magnetic Field of Dry-type Air-core Reactor	524
Yuqi Zhang, Jianli Zhao, Chunxu Qin, Runzong Zhang, Shiyuan Li	
Analysis of AC Receiving-end Fault Characteristics under MMC-MTDC Multi-combination Control Strategy	529
Bo Xie, Bingyuan Yang, Yaguang Zhang, Jiaxing Li	
Author Index	534