

2026 5th International Symposium on New Energy Technology Innovation and Low Carbon Development (NET-LC 2026)

**Shanghai, China
15-17 May 2026**

IEEE Catalog Number: CFP260F0-POD
ISBN: 979-8-3315-6400-1



Copyright © 2026, IEEE

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:	CFP260F0-POD
ISBN (Print-On-Demand):	979-8-3315-6400-1
ISBN (Online):	979-8-3315-6399-8

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

Surface Fault Detection of Wind Turbine Blades Based on Improved YOLOv11	1
<i>Qunhao Zhou, Chuanbo Wen</i>	
Coordinated Operation Strategies for Hybrid Energy Storage Systems Across Multiple Time Scales	5
<i>Zifen Han, Zheng Wang, Fuwen Wang, Li Yang, Tingyu Chen</i>	
Inverse Design and Performance Enhancement of Linear Fresnel Mirror Fields Using Conditional Variational Autoencoder	13
<i>Xintao Peng, Linggang Kong</i>	
Intelligent Optimization of Capacity Configuration for Energy Storage Systems under Photovoltaic Power Generation	26
<i>Xuejiao Jiang, Lei Zhong, Jingxu Yang, Lincong Chen, Jialong Xu, Mingqi Wu, Qingyao Wu</i>	
Hardware Design of a Generator Monitoring Device Based on DSP–ARM Dual-Core Architecture and Dual-Port Shared Memory	32
<i>Zhengyu Zhao</i>	
DSIoU: A Shape-Aware Bounding Box Regression Loss for Wind Turbine Blade Defect Detection	37
<i>Zhe Xu, Yuan Xie</i>	
Research on Wind Turbine Pitch Control Based on HBA-BP Neural Networks	41
<i>Yiming Lei</i>	
Research on Construction Method of Energy Consumption Verification Scenarios for Battery Electric Vehicles Based on Multi-Source Data Fusion	46
<i>Xianfeng Zhang, Bateer Bai, Yu Liu, Guole Nie, Wencui Guo, Xiaoming Ye, Li Xin, Yiming Zhang</i> <i>Hongtao Zhai, Ming Zhang</i>	
Short-Term Wind Power Forecasting Based on SSA-VMD Dual Decomposition, K-means Clustering, and TCN-LSTM Network	59
<i>Wenbin Zhao, Yuan Xie</i>	
A Method for Estimating the State of Health of Lithium-Ion Batteries Based on the Capacity Increment (IC) Curve	64
<i>Bowen Zheng, Ji Qi, Yong Yi, Aina Tian, Xiaoguang Yang, Jiuchun Jiang</i>	
Bayesian Optimization-Driven Machine Learning for Accurate Prediction of Enzymatic Hydrolysis Yield from Sugarcane Bagasse Pretreatment	70
<i>Yi Zhao, Wanting Su, Xuesong Tan</i>	
Numerical investigation of the effect of channel structure on the thermal management performance of a side-cooled prismatic battery	75
<i>Zeshen Liang, Sili Zhou, Heli Zhang, Biao Jin, Junyi Niu</i>	
Torque Ripple Reduction for High-Power PMSG Based on Non-Uniform Air-gap and Magnetic Slot Wedges	79
<i>Qinbo Huang, Yubo Yang, Haoran Li</i>	
A Damage-Aware Dynamic Bayesian Network Framework with Cross-Scale Probability Calibration for Lithium-Ion Battery Energy Storage System Risk Assessment	84
<i>Ziyao Wang, Kui Zhou, Miangang Li, Wei Wang, Yichen Tang, Siyu Dai</i>	

Cross-Scale Energy Constraint Propagation in Multi-Timescale Energy Storage	89
<i>Kanqin Zhuang, Hao Chen, Nan Yang, Ziqiu Liu, Yanan Sun</i>	
Optimal Deployment of User-Side Energy Storage for Capacity Markets Under High Renewable Penetration	94
<i>Changjiang Cui, Shimin Li, Jianzhao Li, Yan Huang, Tao Liu, Yunlong Shang</i>	
Optimized Control of Photovoltaic Power Prediction and Hydrogen Production Systems Using SSA-LSTM with Attention Mechanisms	98
<i>Qingying Zhang, Jingguan Zhang, Mingdao Xu, Minghao Yan</i>	
Hybrid Energy Storage Configuration Based on Task-Driven Deep Embedded Clustering	103
<i>Chuyuan Yang, Rui Shi, Junwei Yao, Bin Chen, Yiheng Han, Shiqin Cheng, Ziwei Huang</i>	
Power allocation and configuration optimization for hybrid energy storage based on GWO-VMD and adaptive frequency band division	108
<i>Chuyuan Yang, Rui Shi, Junwei Yao, Bin Chen, Yiheng Han, Shiqin Cheng, Ziwei Huang</i>	
Economic Optimization of the Full Life Cycle of Electric Buses Based on Real Driving Conditions and Carbon Social Costs	113
<i>Ziyi Wei, Shuhang Liu, Yihan Zhang, Xinmeng Cao, Haipei Lei</i>	
SAC-Based Multi-Objective Optimization of ADRC Parameters for Wind Turbine Pitch Control	118
<i>Yingying Du, Yuan Xie, Wenxian Yang</i>	
Green Ammonia for Marine Decarbonization: Production Pathways and Engine Applications	123
<i>Zhuoli Yang, Maojiang Zheng, Jie Wang, XiaoHua Wang</i>	
DC-Link Energy-State Based Feedforward Power Shaping for Grid-Forming Photovoltaic Converters Under Sudden Irradiance Variation	128
<i>Qian Yan</i>	
Thermocline Evolution Mechanism and Thermodynamic Performance of Pit Thermal Energy Storage Systems Under Buoyancy and Hydrodynamic Effects	132
<i>Yifei Yang, Yining Wang, Ruoying Ma, Mingli Xie</i>	
Deep-Learning-Based Temperature-Field Prediction and Optimization for Power Battery Thermal Management Systems	137
<i>Kangle Shi, Yihao Liu</i>	
Design and Experimental Prototype Validation of a Novel Reflective Fresnel Point Concentrator	143
<i>Yanan Zhang, Xianyou Tang, Jianhan Zhang, Zhifeng Wang, Feihu Sun, Hailing Dai, Junli Xiao Zangbao Du</i>	
Bearing Fault Diagnosis Based on Quantum Feature Enhancement and Transformer-KAN	148
<i>Chuanbo Wen, Zhichao Cai</i>	
A Bearing Fault Diagnosis Method Based on the Swin Transformer-BiGRU Hybrid Fusion	152
<i>Guangyang Guo, Chuanbo Wen</i>	
Research on Objective Sound Quality Parameters of Noise for IPMSMs in New Energy Vehicles	157
<i>Jiajing Fang, Quanfeng Li</i>	
Analysis of Flow and Damage-Induced Vortex Field in APC Propellers for Electric Aviation	161
<i>Jinsong Shi, Quanfeng Li, Zhe Chen</i>	

Vibration Characteristics and Clustering Algorithm Analysis of Scroll Rotor Compressors for New Energy Applications Based on LDV	167
<i>Juntao Gan, Quanfeng Li, Wei Cui</i>	
A Comparative Research on Psychoacoustic Parameters of Asynchronous Motor Noise in New Energy Vehicles Collected by Microphone and Digital Artificial Head	172
<i>Wenjie Guo, Quanfeng Li</i>	
Research on the Material–Modal Coupling Characteristics of eVTOL Rotor Blades for New Energy Electric Aviation	177
<i>Jia Chen, Quanfeng Li, Shengkai Wu</i>	
Design and Analysis of Phase-Shifted Dual Three-Phase Permanent Magnet Motor for eVTOL Applications	182
<i>Shangchong An, Quanfeng Li</i>	
Electromagnetic Performance Optimization of a Bread-Shaped Pole Permanent Magnet Synchronous Motor Based on an Eccentric Structure	186
<i>Shanshan Yang, Quanfeng Li</i>	
A Novel Method for Bearing Fault Diagnosis Combining the Wavelet Synchronous Compression Transform and MCNN-BiGRU-Attention	190
<i>Yongjie Zhang, Zhigao Chen</i>	
A Comparative Study on Axial-Flux and Radial-Flux Motors for Robotic Applications: Implications for New Energy Technology Innovation and Low-Carbon Development	194
<i>Jun Ni, Quanfeng Li</i>	
Research on Electromagnetic Vibration and Noise Suppression of Vehicle-Mounted PMSM Based on Short-Pitch Winding Optimization Scheme	199
<i>Wei Lu</i>	
Comparative Study on Abnormal Separability of Air-Conditioning Rolling Rotor Compressors Using LDV and AS Based on Unsupervised Clustering	203
<i>Juntao Gan, Quanfeng Li, Wei Cui</i>	
Impact of Rotor Skewing on Psychoacoustic Sound Quality of PMSMs for New Energy Vehicle Drive Systems	208
<i>Jiajing Fang, Quanfeng Li</i>	
Investigation of Electromagnetic Characteristics in a Flux-Reversal Machine with Hybrid Permanent Magnets	212
<i>Jinyi Xu, Quanfeng Li</i>	
Back-EMF Characteristics of Brushless Hollow-Cup Motors and Their Applications in Robotics	216
<i>Wei Jin, Quanfeng Li</i>	
Analysis and Harmonic Injection Optimization of Losses in SPMSM Supplied by Frequency Converter	220
<i>Wenhan Zhang, Hengliang Zhang, Quanfeng Li</i>	
Analysis of Factors Influencing the Abnormal Decrease in Energy Consumption of New Energy Vehicles Under High-Temperature Conditions	226
<i>Fengbin Wang, Zhi Lei, Yazhuo Niu, Guole Nie, Bateer Bai, Xianfeng Zhang, Ping Li, Zeyu Li</i>	

Electromagnetic Design and Optimization of a 700 W-class Low-Torque-Ripple Outer-Rotor PM Motor for New Energy Vehicle Coolant Pumps	237
<i>Maidi Du, Quanfeng Li</i>	
Robust Control of Low-Inertia PMSM Based on Anti-windup BP Neural Network	241
<i>Xiangxiang Sun, Quanfeng Li</i>	
Multimodal Fault Diagnosis of Permanent Magnet Synchronous Motors With GMM-Assisted Dynamic Weighting	245
<i>Xianhao Chen, Xiaoliang Feng</i>	
Design and Electromagnetic Performance Analysis of a 50 kW Halbach Permanent Magnet Synchronous Motor for New Energy Vehicle Drive Systems	251
<i>Ruonan Li, Tianyu Liu</i>	
Attention-Guided Transfer Learning With 1d-Cnn for Robust Bearing Fault Diagnosis Under Variable Operating Conditions	255
<i>Haobo Li, Xianwen Zeng</i>	
Analysis of Critical Electromagnetic Force Orders and Their Modulation Issues in Auxiliary Drive Induction Motors for Electric Vehicles	260
<i>Wenjie Guo, Quanfeng Li</i>	
Design of High Power Density eVTOL Drive Motor Based on Fe-Co-V Alloy	264
<i>Shangchong An, Quanfeng Li</i>	
Research on Electromagnetic Vibration Suppression of Permanent Magnet DC Motors Based on Eccentric Magnetic Poles	268
<i>Qingyu Zhang, Wei Xu, Zetao Xue</i>	
Analysis and Suppression of Three-Phase Imbalance in Three-Layer Unequal-Turn Winding Motors with Asymmetric Turn Structure	272
<i>Haoxiang Lv, Wei Xu, Zetao Xue</i>	
Photovoltaic Direct Drive Asynchronous Motor VVVF Speed Control System Modeling And Analysis	276
<i>Yue Zhang, Quanfeng Li</i>	
Electromagnetic Optimization and Performance Analysis of a Double Stator Single Rotor Axial Flux PMSM	281
<i>Yixiang Gu, Quanfeng Li</i>	
A multi-source unsupervised motor fault diagnosis method based on domain adversarial and entropy minimization	285
<i>Xiaoliang Feng, Xuanshui Wang</i>	
Zonal discrimination criteria for different solder layer failure modes in SiC power modules	290
<i>Han Cao</i>	
ANPC Three-Level Traction Inverter Loss Analysis	295
<i>Jing Sun</i>	
Modeling and Simulation Analysis of PMSM Vector Control System Based on SVPWM	299
<i>Changlong Lu, Binbin Li, Xinjian Sha</i>	

Comparative Analysis of Electromagnetic Characteristics of Single-Rotor and Dual-Rotor Axial Flux Motors for eVTOL Propulsion Systems	304
<i>Qian Chen, Quanfeng Li, Shengkai Wu</i>	
Energy Optimization of Centrifugal Cargo Oil Pumps through Variable Frequency Drive Control for FSO Operations	310
<i>Kexu Zhong, Zongfeng Zhang, Xue Yang, Liang Wang, Bin Song</i>	
Radial Electromagnetic Force and Torque Ripple Optimization in IPMSMs	314
<i>Bangxin Ji, Quanfeng Li</i>	
Accelerated Multi-Agent PI Optimization with Online Symmetric Experience Sharing for DC Microgrid Voltage Control	320
<i>Arash Kavousighahfarokhi, M. A. Hannan, Pin Jern Ker</i>	
Urban Pollutant Source Identification With GCN-Enhanced CityTransformer Method	325
<i>Yuanzhang Jiang, Peng Zan, Jingwei Yue, Chunyong Li</i>	
Improved YOLO11m for Insulator Defect Detection in Power Transmission	330
<i>Tingting Sui, He Xiao</i>	
Process Simulation and Parametric Sensitivity Analysis of CO ₂ Absorption by MEA Based on Aspen Plus	335
<i>Gaoqiang Zuo, Shuangzhe Lu, Bingbing Hu, Zihan Chen, Yuhao Xue</i>	
Short-term Power Load Prediction Based on Multi-scale Decomposition and GAO Optimized GRU	341
<i>Huaikang Xu, Yuan Xie</i>	
Architecture-Aware Multi-Agent Reinforcement Learning for Large-Scale Virtual Power Plant Dispatch: Convergence Optimization and Nash Bargaining Fairness	346
<i>Qinhua Huang, Yuan Xie</i>	
Multi-Level Collaborative Optimization Control Strategy for Interaction Between Electric Vehicles and the Power Grid	350
<i>Hao Chen, Kanqin Zhuang, Nan Yang, Kai Xia, Xiangwen Wu</i>	
Research on the Maturity Assessment of Demand-Side Flexibility Resource Development and Utilization Based on the Combinatorial Weighting-TOPSIS Model	356
<i>Hao Chen, Yahui Ma, Aikang Chen, Guang Chen</i>	
Lightweight Detection Algorithm for Transmission Line Foreign Objects Based on Improved YOLOv8	362
<i>Mingming Liu, Yuan Xie</i>	
Energy Structure Transformation Strategies Driven by Policy-Technology Synergy Based on System Dynamics	366
<i>Ruopu Yang, Gongjin Ma, Plingliang Zeng</i>	
Improving Microgrid Frequency Stability and Power Sharing via Series Multi-Scale Dilated CNN-LSTM Load Forecasting and Feedforward Droop Control	375
<i>Yinghao Shan, Meixiang Yang, Qi Hou</i>	
Study on Water Wall Delay under Load Changes in Supercritical Units	379
<i>Pengluan Huang, Fangfang Xia, Guoqiang Hu, Peng Tan, Xin Meng, Guangmin Xie, Hui Wang, Jianlan Li</i>	

Deep Reinforcement Learning-Based Optimal Energy Management and Scheduling Strategy for Microgrids	387
<i>Wenjia Guo</i>	
Heat Load Dispatch Optimization for CHP System using Multi-Task Learning and Particle Swarm Optimization	391
<i>Fangfang Xia, Pengluan Huang, Guoqiang Hu, Xin Meng, Feng Guo, Zhiyu Yang, Jianlan Li</i>	
Research on Frequency Regulation Ramp-Up Collaborative Optimization Mechanism for Spot Market Based on Electric Energy Trusted Identification	397
<i>Yumeng Zhang, Weidong Xiao, Danlei Xu, Guocheng Wang, Fangming Niu, Guomin Li, Jiangtao Li</i>	
Coordinated Low-Carbon Economic Dispatch of Active Distribution Networks Considering Carbon-Green Certificate Mechanisms and Demand Response	403
<i>Huansong Wang, Tianyu Liu</i>	
Data-Driven Adaptive Control of Grid-Connected Inverters in Weak Grids via Output-Feedback Policy Optimization	407
<i>Quanzheng Fu, Bin Wu</i>	
Deep Learning-Based Operating State Prediction and Optimal Control for Energy and Power Systems	411
<i>Yuqiang Sun, Zhiyong Peng</i>	
A Multi-Drone Task Allocation Method for Disaster Inspection Based on an Improved Ant Colony Optimization Algorithm	416
<i>Jintian Xu, Xichao Wang</i>	
Multi-Dimensional Value Assessment Framework for Flexibility Resources Under Electricity-Carbon Market Coordination: A Modified AHP-Entropy Approach	420
<i>Pengwei Cong, Xiaoxuan Zhang, Yu Wang, Yipan Zhang</i>	
Short-Term Power Load Forecasting Based on SSA and Adaboost-Enhanced TCN-GRU	426
<i>Xiangguo Zhang, Li Lu</i>	
Research on Photoelectric Hybrid Sensing Monitoring Technology for Partial Discharge in Gas-Insulated Switchgear	431
<i>Tiancheng Liu, Tingbo Jia, Xiaodong Liu, Xiulong Yang, Xu Chongwei</i>	
Intelligent Low-Carbon Energy System Based on Digital Twin and MARL from Carbon Asset Perspective	438
<i>Hanxiao Li</i>	
A Fault-Tolerant Control Method for IGBT Open-Circuit Faulty MMC Employing Voltage Balancing Channel	442
<i>Chaojie Guo, Fei Yao</i>	
Two-stage Stochastic Optimization Scheduling of an Electro-thermal Integrated System for an Energy-Intensive Industrial Park Considering Uncertainty	447
<i>Zikang Yi, Yulong Ying, Jingchao Li, Bin Zhang, Haojie Lv, Xiaoxia Zhou</i>	
Bidding Equilibrium Analysis in Electricity Spot Markets Considering Mid- and Long-Term Transactions Using MADDPG	453
<i>Hao Yu, Shucan Zhou, Yixin Li, Xin Huang, Minjia Zheng, Hao Sun</i>	

Genetic-Algorithm-Based Optimal Load Regulation for Source-Load Interactive Power Systems	457
<i>Qin Gao, Hongxuan Zhang, Jianxin Zhang, Yong Mei, Chunxiao Liu, Songqiao Li</i>	
Multi-market clearing strategy based on recent cooperation game and real-time correction	462
<i>Shucan Zhou, Yixin Li, Yuan Le, Xinyi Huang, Weijie Wu, Xinyu Zhu</i>	
A Case Study on Multi-Scenario Collaborative Carbon Reduction of a Photovoltaic-Energy Storage-Heat Pump-Charger-Flexible Load System in a Low-Carbon Park Based on TRNSYS	466
<i>Xueming Qiao, Xiaoshuai Lai, Qiannan Lu, Hong Wang, Jianbo Qin, Yang Liu</i>	
Regional Energy Security Evaluation Model Based on Entropy Weight TOPSIS Method	471
<i>Meixiao Chen, Shengwen Liao, Binbin Chen, Yu Liu, Cheng Yang, Yang Yi</i>	
Stochastic Forecasting and Pathway Optimization for Industrial Carbon Peaking in Shenyang, China	476
<i>Hongfei Bao, Minhui Tu, Xiaoqing Xu</i>	
Influence of Electromagnetic Fields on Electricity Driven CO ₂ Resource Utilization	480
<i>Tong Shi, Yongxiang Cai, Shijian Yu</i>	
Power Flow-Driven Carbon Metering and Constrained Dispatch Operation Technology for Smart Grids	484
<i>Jianping Hao, Wenjia Tang, Jiming Tian, Qingsu He, Leyi Ge, Xuecai Wang</i>	
Transformer-Based Deep Reinforcement Learning Approach for Electric Vehicle Charging Routing	490
<i>Chengwei Liu, Jiangliang Jin</i>	
A Study on a Multi-Source Heterogeneous Data Fusion Load Forecasting Model for the New Power System	494
<i>Junjun Wang</i>	
Chronological Benchmarking of Statistical and Machine-Learning Models for Regional Power-System Energy Consumption Forecasting	498
<i>Xinlong Xing</i>	