2024 IEEE the 5th International Conference on Advanced Electrical and Energy Systems

November 29th-December 1st, 2024

Lanzhou, China

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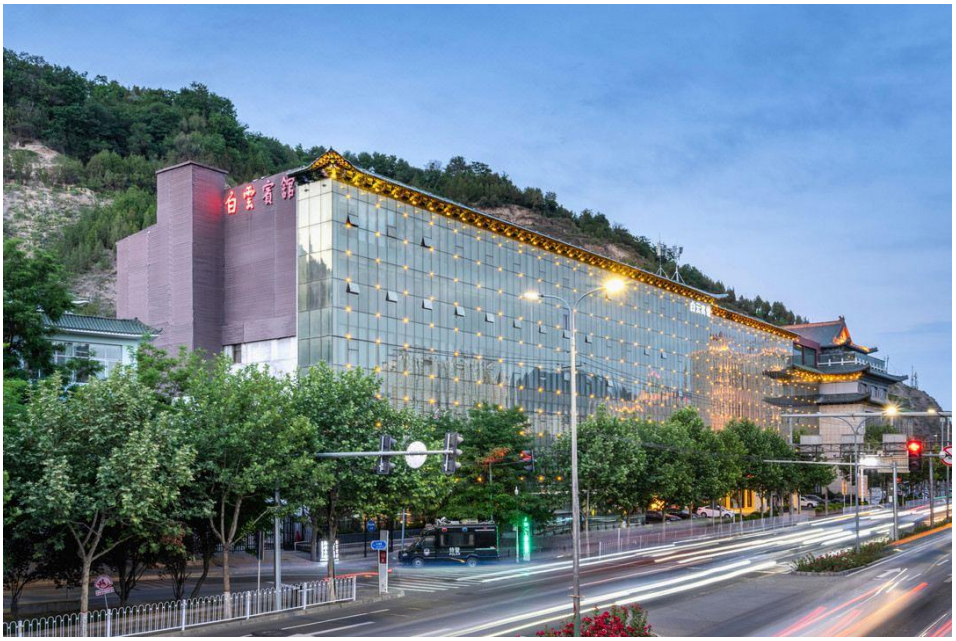
CONFERENCE VENUE



Baiyun Hotel (West Building) | 兰州白云宾馆(西楼)

Address: No. 450 Beibinhe Middle Road, Chengguan District, Lanzhou, Gansu, 730000, China
地址：甘肃省兰州市城关区北滨河中路 450 号

- ✓ Bus Station | 公交:
  金城关站：53/35/108 路
- ✓ Subway Station | 地铁:
  西关地铁站-B 口-步行距离 1.7 公里,约 25 分钟
  小西湖地铁站-C 口-驾车距离 3 公里,约 6 分钟
- ✓ Railway Station | 高铁站:
  兰州西站-驾车距离 6.9 公里,约 16 分钟
  兰州站-驾车距离 12.7 公里,约 25 分钟
- ✓ Airport | 机场:
  兰州中川国际机场-驾车距离 68.9 公里,约 1 小时 10 分钟

NOTE: The organizer won't provide accommodation, and we suggest you make an early reservation.
提示：会议方不安排住宿，请自行提早进行预定。可至酒店前台报会议简称"AEES"入住，
享受协议价 350 元/间/晚，含早。

ONSITE INSTRUCTION

Scan for Conference Photos

Sign-in and Conference Kits Collection/现场签到

10:00-17:00, November 29th, 2024 | 2024 年 11 月 29 日

Baiyun Hotel (West Building) Lobby | 白云宾馆（西楼）大堂

Oral Presentation/口头报告

1. Timing: a maximum of 15 minutes total, including speaking time and discussion. Please make sure your presentation is well timed. Please keep in mind that the program is full and that the speaker after you would like their allocated time available to them.
2. You can use USB flash drive (memory stick), make sure you scanned viruses in your own computer. Each speaker is required to meet her/his session chair in the corresponding session rooms 10 minutes before the session starts and copy the slide file(PPT or PDF) to the computer.
3. It is suggested that you email a copy of your presentation to your personal inbox as a backup. If for some reason the files can't be accessed from your flash drive, you will be able to download them to the computer from your email.
4. Please note that each session room will be equipped with a LCD projector, screen, point device, microphone, and a laptop with general presentation software such as Microsoft PowerPoint and Adobe Reader. Please make sure that your files are compatible and readable with our operation system by using commonly used fronts and symbols. If you plan to use your own computer, please try the connection and make sure it works before your presentation.
5. Videos: If your PowerPoint files contain video clips please make sure that they are well formatted and connected to the main files.

Poster Presentation/海报展示

- Bring your high-resolution printed poster with you to the meeting (size must not exceed A1 [594mm× 841mm]).
- Set up your printed poster at least one hour before your session start time on the day you are scheduled to present.
- Poster presenters are required to stand by the poster during the scheduled duration of the poster session to answer questions from attendees.
- Presenters must remove their printed posters immediately after the poster session.

Dress Code/着装要求

Please attend the conference in formal attire.

Safety Reminder: Secure Valuable Items at All Times/温馨提示：请保管好您的财物。

- Wear your Conference Identification Badge at all times. Do not throw away the Badge.

请不要随意丢弃代表证，如您不需要，请归还至注册台。

- If you are using a laptop computer, do not leave it unattended at any time.

如果您使用笔记本电脑，不要置于无人看管。

- Keep your purse, wallet and other valuables with you at all times.

请随身携带贵重物品，不要随意放置在会议室内，以防丢失。

- The conference organizer will not be responsible for the loss or damage to any personal belongings.

会议组织者将不负责任何个人物品的丢失或损坏。

ONLINE INSTRUCTION

Time Zone: GMT+8 (Beijing Time)

时区：东八区·北京时间

Platform 平台

We will be using Zoom for all our live stream sessions. So, if you haven't installed it, please download a Zoom client from: https://zoom.us/download

会议全程使用 Zoom 在线进行，请提前下载好客户端: https://zoom.com.cn/download

The Zoom account is not mandatory to attend the conference. If you do not want to register the account, by entering meeting ID is also accessible to our conference.

Learn the Zoom skills at: https://support.zoom.us/hc/en-us/articles/206618765-Zoom-Video-Tutorials

Join the Test Session before the Formal Session 正式会议前的测试

Date: November 29th, 2024 时间：2024 年 11 月 29 日

Prior to the formal meeting, presenters shall join the test room to ensure everything is on the right track. Please check your test time on this program. 在正式会议之前，演讲者应加入测试室测试电脑、网络，学会在线会议的基本操作，以确保一切都能正常进行。请在日程上查看您的测试时间。

The Video presentation should be within 12 minutes, 3 minutes for Q&A, in total, one presentation is 15 minutes. 每个演讲者最多 15 分钟，其中 3 分钟用于问答。请确保您的演讲在规划的时间内。

Equipment Needed 所需设备

- A computer with internet connection and camera
- Headphones

Environment Needed 所需环境

- Quiet Location
- Stable internet connection
- Proper lighting and background

Attention Please 请注意

The conference will be recorded. We will appreciate your proper behavior.

Presentation Recording and Broadcasting 会议记录

The photograph(s) or video or audio recording(s) will be taken by conference organizer. It will be used in for conference program purpose. The photograph(s) or video or audio recording(s) shall not be used for commercial nor illegal purpose. Each presentation will be recorded, if you don't want it, please inform our staff ahead of time.

Do not record other presenters' presentation nor distribute it to or share with anyone unless the presenter gives written consent of agree. Failure to do so will be considered a serious academic violation subject to disciplinary/ lawful action.

照片、视频或音频将由会议组织者记录，用于会议日程目的。 会议结束后，照片、视频或音频记录不得将其用于商业目的或非法目的。每个演讲都会被记录下来，如果您不想被记录，请提前通知我们的工作人员。除非演讲者书面同意，请勿录制他人的演讲，或将其分发给任何人或与他人共享，否则将负法律责任。

SCHEDULE AT A GLANCE

Day 1 | November 29th, 2024 (Friday)

Time	Activity	Venue
10:00-12:00 13:30-17:00	Sign-in and Conference Kits Collection	Baiyun Hotel (West Building) Lobby 白云宾馆（西楼）大堂
14:00-15:30	Online Test	ZOOM
Online Test Schedule		
ZOOM Link	851 0303 0735 https://us02web.zoom.us/j/85103030735	
14:00-15:30	Online Session 7, 8	

Day 2 | November 30th, 2024 (Saturday)

Time	Activity		Venue
Host: Xin Li, Lanzhou Jiaotong University			
09:00-09:20	Opening Ceremony	Zhe Chen, Conference Chair	翡翠厅/5F
		Haifeng Huo, Vice President, Lanzhou Jiaotong University	
		Xiangyang Zhao, Director, Technical Committee on Intelligent Distributed Energy, Chinese Association of Automation	
		Long Zhao, State Grid Gansu Electric Power Corp.	
09:20-09:30	Group Photo		
09:30-10:15	Keynote Speech	Prof. Guangning Wu, Southwest Jiaotong University, China Topic: *Intelligent Operation and Maintenance of High-Voltage Equipment for High-Speed Trains with Digital Twin Technology*	
10:15-10:40	Coffee Break		
10:40-11:10	Invited Speech	Prof. Kui Chen, Southwest Jiaotong University, China Topic: *Battery Prognostics and Health Management Technology Based on Big Data Artificial Intelligence*	
11:10-11:40	Invited Speech	Senior Engineer Xiping Ma, State Grid Gansu Electric Power Corp., China	
11:40-12:10	Invited Speech	Assoc. Prof. Song Xiao, Wuhan University, China Topic: *Characteristics of Perfluoromethyl Vinyl Ether: A New Eco - Friendly Alternative Gas for SF_6*	
12:10-14:00	Lunch at 莫斯餐厅/1F		

Day 2 | November 30th, 2024 (Saturday)

Time	Activity		Venue
Host: Shuaibing Li and Zhuoqun Li, Lanzhou Jiaotong University			
14:00-14:30	Invited Speech	Assoc. Prof. Jiefeng Liu, Guangxi University, China Topic: *Research on Aging Quantitative Characterization of the Hotspot Area in Transformer Paper Insulation Based on the Combined Characteristic Parameters of Frequency Domain Dielectric Response*	翡翠厅/5F
14:30-15:00	Invited Speech	Prof. Yue Zhou, Tianjin University, China Topic: *Virtual Energy Storage Systems in Distributed Smart Grid*	
15:00-15:15	Coffee Break		
15:15-16:00	Keynote Speech	Prof. Zhe Chen, Aalborg University, Denmark	
16:00-16:30	Invited Speech	Asst. Zhongbei Tian, University of Birmingham, UK Topic: *Transport Energy System Decarbonization - Highway and Railway Case Studies*	
16:45-17:45	Poster Session		
18:00-19:30	Dinner Banquet & Awards Ceremony at 明珠厅/5F		

Day 3 | December 1st, 2024 (Sunday)

Time	Activity	Venue
Onsite Sessions		
08:30-10:15	**Session 1**-Novel Battery and Electrical Material Experiments	百合厅/6F
	Session 2-Solar Energy Utilization and Photovoltaic Systems	水仙厅/6F
	Session 3-Wind Turbine Analysis and Power Stability Assessment	和舜厅/6F
10:15-10:30	Coffee Break	
10:30-12:30	**Session 4**-Mechatronic and Electrical Equipment Design and Development	百合厅/6F
	Session 5-Control Model and Electrical Performance Analysis in New Power System	水仙厅/6F
	Session 6-New Energy Systems and Energy Networks	和舜厅/6F
12:30-13:30	Lunch at 莫斯餐厅/1F	
Online Sessions		
13:30-15:15	**Session 7**- Novel Electrical Design and Device Development	ZOOM ID 851 0303 0735
15:30-17:30	**Session 8**- Advanced Electronic Technology and Integrated Energy System	

KEYNOTE SPEAKER

Nov.30th | 9:30-10:15
翡翠厅 / 5F

Prof. Guangning Wu

Southwest Jiaotong University, China
IET Fellow, IEEE Fellow

BIO: Guangning Wu, associate dean of Institute of Frontier Science and Technology of Southwest Jiaotong University, second-level professor/ doctoral supervisor, IEEE Fellow, IET Fellow, CIGRE B2 national representative of China, distinguished professor of "Changjiang Scholars" of Ministry of education, obtainer of National Science Fund for Distinguished Youth, famous teacher of national "ten thousand talents plan", head of "national key field innovation team" of Ministry of Science and Technology, State-Council Allowance Obtained Expert, host of "High Voltage Technology" National First-class Course, leader of academic and technological in Sichuan Province.

With the goal of ensuring the safe operation of key traction power supply equipment for high-speed railway, Professor Wu has successively presided over and undertaken a number of major scientific research projects, including 10 National Natural Science Foundation projects, among them 1 Outstanding Youth Science Foundation project, 3 Key Fund projects, and more than 20 national, provincial and ministerial scientific research projects such as National Key R & D Program. Focusing on the general idea of "core materials-key equipment-system protection" of high-speed railway, Professor Wu has carried out systematic and in-depth research work in three aspects: advanced electrical materials of rail transit, state detection of traction power supply equipment, overvoltage and protection of traction power supply system.The research results have been applied to high-speed railway of Wuhan-Guangzhou, Beijing-Shanghai, Harbin-Dalian and heavy haul railway of Daqin and Shuohuang, and won the Second Prize of State Scientific and Technological Progress (ranking first), the First Prize of Science and Technology Progress of Ministry of Education (ranking first), the First Prize of Science and Technology Progress of Sichuan Province (ranking first), and the First Prize of Science and Technology of China Railway Society (ranking first). And four IEEE International Standards and two industry standards were formulated, 10 monographs and textbooks were published, and 71 invention patents were authorized. Professor Wu serves on the editorial board of journals such as "High Voltage", "Journal of Electrotechnical Technology", "High Voltage Technology" and other journals. He has been on the editorial board of "IEEE Trans. Power Del.", "IEEE Trans. Dielectric and Electric Insul." and "IEEE Trans. Plasma Sci." and other domestic and foreign journals published 216 SCI/EI papers, laying a good foundation for China's high-speed rail technology and equipment to go global.

KEYNOTE SPEAKER

Intelligent Operation and Maintenance of High-Voltage Equipment for High-Speed Trains with Digital Twin Technology

Abstract: High-speed railways serve as major arteries in the national economy and are key drivers of economic development. The total operation mileage of China's high-speed railway has achieved 45,000 kilometers by the end of 2023, securing its position as the largest in the world. High-speed trains operate under challenging conditions such as frequent over-voltage events and large temperature fluctuations. These conditions expose high-voltage equipment to risks such as dielectric aging and discharge development, which can severely impact the stability and reliability of train operations. To address the uncertainty and risks associated with the operation and maintenance of high-voltage equipment, intelligent operation and maintenance (IOM) systems have emerged as a solution. IOM provides an innovative approach to overcoming the limitations of traditional high-voltage equipment detection methods. By integrating intelligent perception with advanced maintenance strategies, IOM enhances maintenance efficiency, reduces failure risks, and supports the nation's industrial upgrading, thereby strengthening core industrial competitiveness. To comprehensively and accurately reflect the operational status of high-voltage equipment, digital twin technology has become a pivotal development direction. This technology enables precise mapping of operational data and the real-time state of high-voltage equipment in high-speed trains. It provides a valuable approach for state monitoring, fault early warning, and informed decision-making in operations and maintenance. In the future, digital twin technology is expected to play a transformative role in performance optimization, maintenance management, and cross-system integration, contributing to the enhancement of high-speed rail safety and control. By leveraging these advancements, the management and operational efficiency of high-speed trains can be significantly improved, ensuring their continued contribution to economic growth and technological progress.

INVITED SPEAKER

Nov.30th | 11:40-11:10

翡翠厅 / 5F

Prof. Kui Chen

Southwest Jiaotong University, China

BIO: Chen Kui is a professor and doctoral supervisor of Southwest Jiaotong University, national young talent, member of CIGRE B3 China Special Committee, member of IEEE PES Electric Vehicle Committee, and member of Energy Storage System and Equipment Professional Committee of China Electrotechnical Society. He is responsible for research projects such as the National Overseas High-level Talents Program, the Seventh Framework Program of the European Union, and the French National Research Agency. He is engaged in research on battery health management systems, big data artificial intelligence and its applications, electrical equipment durability and health management. He is the young editorial board member of Green Energy and Intelligent Transportation, and the young editorial board member of Energy Storage Science and Technology.

Battery Prognostics and Health Management Technology Based on Big Data Artificial Intelligence

Abstract: Energy storage system can smooth the fluctuation of new energy generation, and is a key technology to promote the development of new energy and ensure the safety of power grid. With the implementation of the"carbon peaking and carbon neutrality" strategy, energy storage systems have developed rapidly. However, with the wide application of batteries, its durability and safety problems are becoming increasingly prominent. The performance of the battery deteriorates gradually with the increase of the service cycle, and the intelligent operation and safety warning of batteries in the whole life cycle are urgently required. Ensuring the safe and stable operation of batteries is the cornerstone of promoting the large-scale development and utilization of new energy and realizing China's dual-carbon goal. This report mainly introduces the intelligent modeling method of battery, battery performance evaluation, and battery maintenance early warning technology.

INVITED SPEAKER

Nov.30th | 11:10-11:40

翡翠厅 / 5F

Senior Engineer Xiping Ma

State Grid Gansu Electric Power Corp., China

BIO: 马喜平，1987 年出生、高级工程师，长期从事新能源发电与并网技术研究工作，甘肃省领军人才一层次。牵头或作为主要负责人完成国家自然基金、国家能源局、甘肃省重大专项、国网公司科技项目 20 余项，获得包括甘肃省科技进步一等奖、甘肃省专利一等奖、陕西省科技进步二等奖等省部级奖励近 20 余项；负责编写专著 1 部；发表论文 68 篇，授权发明专利 20 余项；参与和牵头编写国家/团体等标准 15 余项。先后荣获甘肃青年科技奖、中国能源研究会优秀青年能源科技工作者等!

甘肃新能源发展及新型电力系统建设

INVITED SPEAKER

Nov.30th | 11:40-12:10

翡翠厅 / 5F

Assoc. Prof. Song Xiao

Wuhan University, China

BIO: Xiao Song is an associate professor at Wuhan University with a Ph.D. from both China and France. He went through a long time researching SF_6 eco-friendly insulating alternative gases. He currently serves as the deputy secretary-general of the Youth Working Committee of the China Electrical Engineering Society, secretary-general of the China Environmental Power Equipment Industry Innovation Alliance, member of the Intelligent Perception Professional Committee of the China Electrotechnical Society, member of the National High Voltage Direct Current Transmission Equipment Standardization Technical Committee, Chinese representative member of Working Group B3.59 and B3.60 of CIGRE NGN and convener of young experts group (B3). He was awarded the first prize for scientific and technological progress in Chongqing, the first prize for scientific and technological progress in China Electrical Engineering Society, the second prize for scientific and technological progress in Guizhou Province and the second prize for cooperation between industry, academia and research in China. He was chosen for the "Young Talents Project" of China Association for Science and Technology and "Chutian Scholars Program" of Hubei Province, and won the honorary title of "Upward and Kind-hearted Youth" throughout the country.

Characteristics of Perfluoromethyl Vinyl Ether: A New Eco-Friendly Alternative Gas for SF_6

Abstract: The exploration of eco-friendly insulating gas to substitute the most greenhouse gas Sulfur hexafluoride (SF_6) has consistently garnered significant attention. Perfluoromethyl vinyl ether (PMVE, C_3F_6O) is a gas with a low liquefaction temperature (-26 ℃) and toxicity comparable to that of C_4F_7N and $C_5F_{10}O$. It is widely used as an intermediate in the production of fluoroelastomers and pesticides. PMVE gas has passed the breaking performance test of the IEC international standard. To explore the basic properties of PMVE, we evaluated the feasibility of PMVE as a new branch of eco-friendly insulating gas for the first time. The primary dielectric and stability characteristics of PMVE regarding AC breakdown, partial discharge, dielectric recovery, and decomposition properties were revealed under various gas pressure and electrical field conditions. It was found that PMVE demonstrated superior dielectric strength, with the AC breakdown and partial discharge inception voltage (PDIV) 1.1 and 1.14 times that of pure SF_6. Furthermore, the dielectric strength of PMVE exhibits stability even after undergoing 100 cycles of AC breakdowns, and there is no observable formation of solid precipitation on the electrode surface. The discharge decomposition of PMVE mainly generates CF_4, C_2F_6, C_3F_6, C_3F_8, CO. These gases are less varied than other eco-friendly insulating gases. Overall, the exceptional insulation stability and no absence of solid precipitation features endow PMVE to be utilized as a new eco-friendly gas for SF_6-free gas-insulated equipment.

AEES

INVITED SPEAKER

Nov.30th | 14:00-14:30
翡翠厅 / 5F

Assoc. Prof. Jiefeng Liu

Guangxi University, China

BIO: Jiefeng Liu, Ph.D., Associate Professor, Ph.D. Supervisor, Guangxi Bagui Young Top Talent, Recipient of the Guangxi Outstanding Youth Science Foundation, IEEE Senior Member, Winner of the Chongqing Municipality Outstanding Doctoral Dissertation Award, and the Chongqing University Outstanding Doctoral Dissertation Award.

Dr. Liu has long been engaged in research on insulation aging assessment and life prediction of electrical equipment. He has independently led over 10 national and provincial research projects, including the National Natural Science Foundation of China (NSFC) General Program, the NSFC Young Scientists Fund, the Guangxi Bagui Young Top Talent Program, the Guangxi Outstanding Youth Science Foundation Program, and the Guangxi Natural Science Foundation Youth Project. Dr. Liu has been awarded one First Prize in Guangxi Technological Invention (as the second contributor), one First Prize in Guangxi Teaching Achievements, and a Gold Medal at the Geneva International Exhibition of Inventions. As a key team member, he has deeply participated in over 10 national research projects, including the National Key Research and Development Program, NSFC Key Programs, and NSFC General Programs, achieving a single patent transfer worth 1.01 million RMB. Dr. Liu has published over 80 SCI-indexed papers as the first author or corresponding author, including more than 30 in IEEE Transactions journals, over 10 in top-tier journals (Category I by the Chinese Academy of Sciences), and five ESI Highly Cited Papers. He holds over 30 authorized invention and utility model patents. Additionally, he has contributed to the development of one discipline development plan for Smart Grid Information Engineering and participated in drafting three national or electric power industry standards.

Research on Aging Quantitative Characterization of the Hotspot Area in Transformer Paper Insulation Based on the Combined Characteristic Parameters of Frequency Domain Dielectric Response

Abstract: The service life of transformer oil-paper insulation is mainly determined by the aging degree of paper insulation, while the aging state of hotspot area in paper insulation is the most serious. In order to solve the issue that the traditional methods cannot characterize the aging of hotspot area in paper insulation, in this project, the quantitative characterization method of the aging of hotspot area in transformer paper insulation based on the combined characteristic parameters of frequency domain dielectric response is the first to be explored. Firstly, the reaction molecular dynamics simulation and phase analysis techniques are utilized to explore the types and distribution of aging by-products of oil-paper insulation under the hotspot aging state. Then, a frequency domain dielectric response model considering the differences in axial temperature distribution of paper insulation is constructed so as to extract the combined characteristic parameters of frequency domain dielectric response that could characterize the aging state of hotspot area in oil-immersed paper insulation. Finally, a quantitative characterization model of the aging state of hotspot area in oil-immersed paper insulation is proposed by integrating the cellulose aging second-order kinetic equation and the combined characteristic parameters of frequency domain dielectric response. The aim of this project is to break through the technique bottlenecks of dielectric response method in the field of aging evaluation of hotspot area in transformer oil-immersed paper insulation. The contribution of research results not only have important academic value in deepening of the dielectric response theory, but also have important engineering significance for monitoring the potential risks of the "weak area" of the transformer paper insulation and ensuring the safe operation of the energized transformers.

INVITED SPEAKER

Nov.30th | 14:30-15:00
翡翠厅 / 5F
ZOOM ID: 851 0303 0735
https://us02web.zoom.us/j/85103030735

Prof. Yue Zhou

Tianjin University, China

BIO: Yue Zhou is a professor at the School of Electrical and Information Engineering, Tianjin University, China. He obtained his bachelor and PhD degrees in electrical engineering from Tianjin University in 2011 and 2016, respectively. He worked as a postdoctoral research associate and a lecturer during 2017 – 2020 and 2020 – 2024, respectively, after which he joined Tianjin University as a professor.

Prof. Zhou's research interests lie in power system demand side response, peer-to-peer energy trading and cyber physical systems. He has published more than 100 peer-reviewed journal and conference papers, with Google citations over 5500 and h-index over 34. He has led or participated in more than 15 UK and EU projects. Prof. Zhou is a Managing Editor of Applied Energy, an Associate Editor of IET Renewable Power Generation and IET Energy Systems Integration, a Subject Editor of CSEE Journal of Power and Energy Systems, and an Editorial Board Member of Protection and Control of Modern Power Systems and Energy Conversion and Economics. He was the CIGRE UK NGN Chair in 2022.

Virtual Energy Storage Systems in Distributed Smart Grid

Abstract: In the process of net-zero carbon transition, how to utilise the flexibility of distributed energy resources to cope with the many challenges brought by the large-scale connection of themselves has become a key issue to be solved urgently. Virtual energy storage systems (VESSs) is a new technology for the aggregation and management of energy storage equipment and flexible loads, which can effectively use their complementary characteristics to improve their overall flexibility and achieve the effect of "1+1>2". This talk starts from the development background of distributed smart grid in the context of net-zero transition, introduces the basic concepts of VESSs, and then introduces the principles and applications of VESSs from two aspects: matching between multi-time granularity flexibility, and trade-off between response certainty and investment cost.

KEYNOTE SPEAKER

Nov.30th | 15:15-16:00

翡翠厅 / 5F

ZOOM ID: 851 0303 0735

https://us02web.zoom.us/j/85103030735

Prof. Zhe Chen

Aalborg University, Denmark

IET Fellow, IEEE Fellow

BIO: Zhe Chen, a professor at Aalborg University, Denmark, head of the wind energy research team, serves as editor/associate editor/editorial board member for several international journals. His main research directions include modern power system, multi-energy systems, smart grid, renewable energy generation, power electronic systems, etc. and he has published more than 1,000 papers in these fields. Professor Zhe Chen is a fellow of IEEE, IET and AAIA, a Chartered Engineer, a member of the Danish Academy of Engineering, and a member of the European Academy of Sciences and Arts.

INVITED SPEAKER

Nov.30th | 16:00-16:30

翡翠厅 / 5F

ZOOM ID: 851 0303 0735

https://us02web.zoom.us/j/85103030735

Asst. Prof. Zhongbei Tian

University of Birmingham, UK

BIO: Dr Zhongbei Tian is an Assistant Professor in Transport Energy Systems Research at the School of Engineering, University of Birmingham.

Dr Zhongbei Tian's research interests include transport energy system modelling and analysis, energy-efficient train control, energy system optimisation, and sustainable transport energy systems integration and management. He has a strong track record in railway energy systems for over 10 years and now moves to multi-modal transport combining railway, road, and maritime for passenger and freight. Dr Zhongbei Tian has published over 90 high-impact papers. He has been leading a number of projects funded by EPSRC, Royal Society, Network Rail, RSSB, and Innovate UK.

Transport Energy System Decarbonization - Highway and Railway Case Studies

Abstract: Energy and environmental sustainability in transportation are becoming ever more critical. Electrified transportation systems play an essential role in contributing to reducing energy usage and CO_2 emissions. This presentation will introduce the development of transport energy systems with renewable energy sources and energy storages. The railway application introduces a multi-train traction power network modelling method, and energy optimisation technologies of train driving and renewable integration technologies. The highway application introduces the modelling of highway multi-energy systems with the optimization algorithms.

Poster Session

Chairperson:

Yulong Che, Lanzhou Jiaotong University, China

Lixia Yang, Lanzhou Jiaotong University, China

Time: 16:45-17:45, Nov. 30th, 2024	Room: 翡翠厅/5F

*Note: Please paste poster on the designated display board at least 10 minutes before the session starts. Please take it away after the session, otherwise conference team will dispose the posters.

Poster Session A: New Energy Generation and Energy Storage Technology

P01 AE0477	Optimal Configuration and Dispatch of Distribution Network based on Wind-Solar-Hydrogen Coupling **Wenyao Su**, Hongsheng Su, Tian Zhao, Bin Hu, Xun Wu, Dengfeng Wang Lanzhou Jiaotong University, China
P02 AE1064	Aviation Carbon Neutrality Achieving by Wind Lidar Retrieval Algorithm Based on Multi-core CT-LSM Wei Wei, Lijing Chen, **Jian Wang**, Tao Cai Gansu Branch of Northwest Air Traffic Management Bureau China, Civil Aviation, China
P03 AE2299	Research on Small Target Defect Detection of New Energy Oil and Gas Pipelines based on YOLOv5 Sanjun Gong, Zhuye Xu, Xiaodong Zhang, **Xiao Tang**, Hengyuan Lian Lanzhou Jiaotong University, China
P04 AE7439	Research on New Energy Insulator Defect Detection Method based on Improved YOLOv5 Pei Zhang, Ma Li, **Zhuye Xu**, Ninghui He, Fan Sun Lanzhou Jiaotong University, China
P05 AE2566	Oil and Gas Pipeline Fault Diagnosis Algorithm for New Energy Power Supply based on Transfer Learning And Improved Residual Network Pengrong Wen, Zhuye Xu, Xichun Liu, **Songbai Li**, Zisheng Ou Lanzhou Jiaotong University, China
P06 AE4151	Research on Frequency Modulation Response Technology for Wind Farms with Integrated Energy Storage **Wenxi Zhen**, Junhong Duan, Xiping Ma and Baixu Chen State Grid Gansu Electric Power Company, China
P07 AE4830	Technical Innovation of Oil and Gas Pipeline Safety Detection based on YOLOv8 in the Context of New Energy Fengqing Li, Zhuye Xu, Peng Gao, **Yucong Guo**, Ke Zhao Lanzhou Jiaotong University, China
P08 AE5254	Study on the Operation Characteristics and Short-term Optimal Dispatch of Energy Supply System for Near-Zero Energy Buildings Na Wang, **Wenbing Wu**, Xiaofei Zhen, Xu Zhang Lanzhou Jiaotong University, China
P09 AE6227	Wind Speed Correction Method for Wind Power Based on Markov Chains Ruiyuan Ji, Hao Zhang, **Weilong Yu**, Mengxing Liu, Zhe Qiu, Shuaibing Li Lanzhou Jiaotong University, China

P10 AE7179	Analysis of Wind Shear Index Algorithm and Wind Speed Estimation in Wind Farms **Huihui Yin**, Junxia Jiang, Huan Du Lanzhou Jiaotong University, China
P11 AE7225	Wind Turbine Blade Fault Prediction Based on EEMD-HHT and CBCNN Qiu-zhan Zhou, **Wan-chao Deng**, Xiao Chen, Hui-nan Wu, Feng Wang, Wen Zhang, Chen Li, Ping-ping Liu, Cong Wang Jilin University, China
P12 AE7702	A Review of the Application of Distributed Photovoltaic System in Highway Tunnels under the Integration of Transportation and Energy **Tongtong Fu** and Ruoqiong Li Lanzhou Jiaotong University, China
P13 AE9129	A Review of Research Results on Energy Internet and Application of Digital Twins to It **Yanzi Yang** and Wei Wei Lanzhou Jiaotong University, China
P14 AE1167	Research on The State Evaluation of Lead-acid Batteries Based on Fuzzy Comprehensive Evaluation Method **Sijiang Zhang**, Zhiqi Xu GanSu Guangming Electric Power Engineering Consulting and Supervision Co.,Ltd, China
P15 AE7191	Optimization Design Study of Farm Biogas Cogeneration Supply System based on TRNSYS Simulation **Ke Li**, Xiaofei Zhen, Lingxi Zhang, Zhiguo Li, Wenbing Wu, Han Zhan Lanzhou Jiaotong University, China
P16 AE3376	Design of Oxide-coated Ru Cluster Electrodes and Performance Analysis in Zinc-air Batteries Zengpeng Li, **Kun Luo**, Wanjun Sun and Kai Wang Lanzhou Jiaotong University, China
P17 AE7804	SSA-CNN-LSTM-based Power System Node Carbon Emission Factor Prediction Yang Zhang, **Laijun Wang** Lanzhou Jiaotong University, China
Poster Session B: Intelligent Power Control System Model, Reliability Analysis and Safety Assessment	
P18 AE0576	Analysis of Turbulence Intensity Characteristics of Desert Photovoltaic Power Station **Huan Du**, Junxia Jiang, Huihui Yin Lanzhou Jiaotong University, China
P19 AE0093	Construction Method for a Precision Power BeiDou Service Network Assisted by Low Earth Orbit Satellites **Meng-yao ZHANG**, Meng-qi CHEN State Grid Information & Telecommunication Group Co., Ltd, China
P20 AE0627	Fault Diagnosis Method for Compensation Capacitor and Tuning Area Based on Graph Convolutional Network Jinbi Xue, **Guiyuan Lai** Lanzhou Jiaotong University, China

P21 AE0635	Wavelet Neural Network-Enhanced Meteorological Data Recovery for Airport Energy Optimization Guangwen Yuan, Haiqing Peng, Jian Wang, **Tao Cai** Gansu Branch of Northwest Air Traffic Management Bureau China, Civil Aviation, China
P22 AE2428	Cluster Analysis for Transformer On-load Tap Changer Contacts Fault Identification Zhiqi Xu, Sijiang Zhang, Yanwen Xu, Dexiang Yang, Zhanhai Zhang and **Hongyu Li** Lanzhou Jiaotong University, China
P23 AE1089	Impact of CF4 Plasma Modification on the Dielectric Properties in Frequency Domain of XLPE **Ren-Xiang Hu**, Pei Wang, Xin-Gang Hu, Feng-Yang Han, Hong-Yu Dou State Grid Tulufan Electric Power Supply Company, China
P24 AE141E	Optimization of DC Distribution Network Considering SOP Topology Reconfiguration under EV Access **Gang Lu**, Yongqiang Kang, Meng Chen, Xinglong Li, Shuaibing Li Lanzhou Jiaotong University, China
P25 AE2551	Large Disturbance Stability Analysis of System with Paralleled Grid Following-Voltage Source Converter and Grid Forming-Voltage Source Converter Yang Wang, Yongxiang Cai, **Yu Wang**, Huajun Zheng, Guangze Ouyang, Yutao Xu Guizhou University, China
P26 AE5273	Dynamic Power Flow Calculation of High-speed Railway Traction Power Supply System Based On Vehicle Network Coupling **Shun Liu** and Ruoqiong Li Lanzhou Jiaotong University, China
P27 AE1973	Research on Low Power Strategy Optimization and Environmental Adaptability of 5G RedCap Terminal for Electric Power Application Jinshan Chen, **Shiyu Wu**, Xinlan Wang, Sihang Yu, Chaoping Deng, Guodong Lin and Zhaoxiang Li Electric Power Research Institute of State Grid Fujian Electric Power Co., Ltd., China
P28 AE5345	Study on the Coordinated Control Strategy of Electric-hydrogen Microgrid **Shengen Yu**, Mingche Li, Jijun Ma, Xiaolin Zhang Lanzhou Jiaotong University, China
P29 AE2132	Prediction of Urban Electric Vehicle Charging Load Based on Monte Carlo Method **Guojie Hao**, Jian Yang, Qing Xu, Haitao Niu, Xinyue Wu, Siqun Zhang State Grid Gansu Electric Power Company Baiyin Power Supply Company, China
P30 AE2465	Research Progress on Dynamic Wireless Charging Systems for Electric Vehicles **You Xiang**, Ruoqiong Li Lanzhou Jiaotong University, China
P31 AE4029	Collaborative Transfer Operation Strategy for Flexible Interconnected Systems Considering Transient Stability Yongxiang Cai, Yutao Xu, **Ting Liu**, Huajun Zheng, Feng Wang, Molin He Guizhou University, China
P32 AE4707	Fault Condition Assessment of Transformer On-load Tap-changer Contacts Based on Joint Electromechanical Diagnosis Sijiang Zhang, Zhiqi Xu, Zhanhai Zhang, Yanwen Xu, Dexiang Yang and **Pengzhen Wu** Lanzhou Jiaotong University, China

P33 AE5197	Characterisation of Line Losses on High Voltage Overhead Transmission Lines under Extreme Conditions **Qi Liu**, Shenghu Tao, Yang Zhang State Grid Gansu Power Company Dingxi Power Supply Co., Ltd, China
P34 AE6455	A Review of Regenerative Braking Energy Recovery Research for Pure Electric Vehicles **Shijie Lv** and Xin Li Lanzhou Jiaotong University, China
P35 AE7942	Optimisation of ZVS-controlled Inverter Range for Light Load Section of N-phase Interleaved Parallel Three-level Bidirectional Buck/Boost Converter Xiangzhen Yang, **Xu Gao**, Yan Du, Di Xie, Jigang Yao, Liangliang Wang Hefei University of Technology, China
P36 AE6816	Control of Permanent Magnet Synchronous Motor in EMA System Based on Superhelical Membrane Observer without Position Sensors **Jukui Chen**, Bo Wang, Jingbo Chen, Haiying Dong Lanzhou Jiaotong University, China
P37 AE6904	Optimization Design of Electromagnetic Structure of Traction Transformer Based on NSGA-II Optimization Algorithm Hua Shen, Jiachuan Shao, **Zhaoxu Su** Lanzhou Jiaotong University, China
P38 AE7216	The Research on Bi-Level Programming for Distribution Network Energy Storage in Remote Areas **Tiecheng Gang**, Yongzhi Min, Guo Wang, Li Yang Lanzhou Jiaotong University, China
P39 AE8548	On Technical Advantages of VSC with Parallel Connection: From Viewpoints of Over-Current, Overload Capacity and Dynamical Var Support **Jing Cai**, Xia Li, Qiang Guo, Zhida Su, Ping Ding, Yilang Jiang, Yan Li, Gechao Huang China Electric Power Research Institute Ltd., China
P40 AE7778	Research on Fault Diagnosis Method of Lithium Battery Energy Storage System based on Data Drive **Zhou Li**, Wenjiong Cao, Xiaobin Yao, Yuanyuan Zhou, Jiangang Li , Ti Dong Lanzhou Jiaotong University, China
P41 AE9567	An Improved Single Phase Locked Loop Applied to Frequency Measurement of Charging Pile **Ye Yang**, Wen Wang, Yang Du, Jiahao Li, Zhanning Liu, Jian Qin, Peijun Li, Lingyu Guo State Grid Electric Vehicle Service Co., Ltd, China
P42 AE7780	A Review of Force Sensing Control and Key Technologies for Electrically Manipulated Load Systems **Jia Ma** and Ruoqiong Li Lanzhou Jiaotong University, China
P43 AE9201	Designing and Engineering of Porous Architectures in Assembling MXene-based Supercapacitor: A Review **Bowen Tan**, Meijie Hu, Jifei Liu, Kai Wang, Wanjun Sun, Jinlei Fan, Zengpeng Li, Fupeng Zhi, Feitian Ran Lanzhou Jiaotong University, China
P44 AE143E	Research on a Bipolar Structure Voltage Sensor Based on Capacitive Coupling Principle Bofeng Luo, Shijie Li, Tianyu Hou, **Siyu Hu**, Chuyan Zhang China University of Geosciences Beijing, China

Session 1- Novel Battery and Electrical Material Experiments Chairperson: Zhuoqun Li, Lanzhou Jiaotong University, China	
Time: 08:30-10:15, December 1st, 2024	Room: 百合厅/6F
*Note: The schedule of each presentation is for reference only. Authors are required to attend the whole session, in case there may be some changes on conference day. Please join in the room 5-10 minutes earlier.	
08:30-08:45	(AE3761) A State of Health Estimation Method for Lithium-ion Batteries Based on Duration of an Equal Discharging Voltage Difference and XGBoost **Yuqi Li**, Longyun Kang, Xuemei Wang and Rui Yue South China University of Technology, China
08:45-09:00	(AE4223) Effect of Gradient Porosity on the Transmission Characteristics of Lithium-ion Batteries **Yiming Sun**, Ti Dong, Ya Wang, Fengbin Li, Wenjiong Cao, Jia Liu Lanzhou University of Technology, China
09:00-09:15	(AE1239) Research on the Influence of Thermal Aging on the Frequency-Domain Dielectric Response of Insulation Materials for Dry-Type Bushing Cores **Yajun Qiao**, Peijie Cong, Yun Liu, Tao Hu, Fusheng Zhou Guangzhou Power Supply Bureau Substation Management Section Three, China
09:15-09:30	(AE7217) A State of Health Estimation Method for Lithium-ion Power Batteries Based on Incremental Capacity Curves and Transfer Learning **Rui Yue**, Xuemei Wang, Longyun Kang and Sheng Huang South China University of Technology, China
09:30-09:45	(AE3092) PEMFC Cold Start Model Simulation in Low Temperature Environment **Zengpeng Li**, Yongzhi Wan, Jinbo Liu, Jinlei Fan, Yang Yuan, Wanjun Sun, Feitian Ran, Kai Wang, Jifei Liu Jiuquan Vocational and Technical College, China
09:45-10:00	(AE6038) Research on Life Prediction of Hydrogen Fuel Cell Based on Bi-LSTM-SSA **Amin Huang**, Haiying Dong, Na Sun Lanzhou Jiaotong University, China
10:00-10:15	(AE3829) Performance Evaluation of Component-based Mobile Charging and Discharging Facilities Based on Game Theory-Combinatorial Affiliation Functions **Hua Xia**, Chen Yang, Jianzhou Zhang and Xiaoqing Huang NARI Nanjing Control System Co., Ltd., China
Best Presentation Award & Session Group Photo	

Session 2- Solar Energy Utilization and Photovoltaic Systems Chairperson: Ti Dong, Lanzhou Jiaotong University, China	
Time: 08:30-10:15, December 1st, 2024	Room: 水仙厅/6F
*Note: The schedule of each presentation is for reference only. Authors are required to attend the whole session, in case there may be some changes on conference day. Please join in the room 5-10 minutes earlier.	
08:30-08:45	(AE4483) Research on Power Quality Management and Energy Optimization of RPC Based on Photovoltaics and energy storage **Weile Chen**, Xia Zhao, Ying Wang, Xiaoqiang Chen, Leijiao Ge and Xiping Ma Lanzhou Jiaotong University, China
08:45-09:00	(AE1797) Low-Frequency Stability Analysis of Photovoltaic Storage Integration Into Vehicular Network Based On Optimized Exclusion Zone Criterion **Jin Cai**, Xiaoqiang Chen, Ying Wang, Xingbo Zhao, LeiJiao Ge, XiPing Ma Lanzhou Jiaotong University, China
09:00-09:15	(AE4397) Recognition Algorithm for Dust on Solar Photovoltaic Panels Based on R-CNN **Manling Yin**, Zhuoqun Li, Xin Wen, Xiang Dou, Changjiang Xing, Lixia Xi Lanzhou Jiaotong University, China
09:15-09:30	(AE7124) Spatio-Temporal Variations of Carbon Flux in Photovoltaic Power Stations **Rui Chen**, Zhuoqun Li, Hao Peng, Xiaoyang Li, Litao Zhang, Siyue Gao Lanzhou Jiaotong University, China
09:30-09:45	(AE7178) Design of Multi-machine Cooperative Photovoltaic Energy-saving Disinfection System **Weijia Li**, Xiaofei Zhen, Haiming Yan, Taotao Wang, Mei Liu, Yujun Xiao Lanzhou Jiaotong University, China
09:45-10:00	(AE8008) Carbon Footprint Comparison of Photovoltaic Industries in China EU and US **Bo Zhao**, Zhuoqun Li, Zixing Fang, Hanbo Hu, Ruixue Zhang, Huijie Yi Lanzhou Jiaotong University, China
10:00-10:15	(AE0755) Simulation and Design of a Rural Biomass and Solar Energy Combined Heating System Based on TRNSYS **Haiming Yan**, Xiaofei Zhen, Taotao Wang, Yujun Xiao, Mei Liu, Weijia Li Lanzhou Jiaotong University, China
Best Presentation Award & Session Group Photo	

Session 3- Wind Turbine Analysis and Power Stability Assessment Chairperson: Jingxian He, Lanzhou Jiaotong University, China	
Time: 08:30-10:15, December 1st, 2024	Room: 和舜厅/6F
*Note: The schedule of each presentation is for reference only. Authors are required to attend the whole session, in case there may be some changes on conference day. Please join in the room 5-10 minutes earlier.	
08:30-08:45	(AE4825) Stability Analysis of Wind Solar Power Grid Integration based on Chaos Analysis **Hongsheng Wang**, Chong Shao, Xin He, Ruhai Hao, Chen Zhou and Haiying Dong Lanzhou Jiaotong University, China
08:45-09:00	(AE3044) The Effect of Longitudinal Rocking Motion on the Wake Flow of a Vertical Axis Wind Turbine **Kunru Jia**,Xuyao Zhang,Lihong Zhang Lanzhou Jiaotong University, China
09:00-09:15	(AE3900) Experimental Wind Tunnel Study of Vertical Axis Wind Turbine Interactions **Hanbo Hu**, Zhuoqun Li, Bo Zhao, Zixing Fang, Chengyong Song, Wenyan Zhou Lanzhou Jiaotong University, China
09:15-09:30	(AE8994) Enhanced Deadbeat MPC for Robust Large-Scale Wind Power Integration into Smart Grid **Muhammad Shahid Mastoi**, Delin Wang, Mannan Hassan, Xin He Southwest Jiaotong University, China
09:30-09:45	(AE5724) Analysis of the Broadband Oscillation Mechanism of Wind, Solar, and Fire Bundling Honglei Xu, Yong Yang, Jinggeng Gao, Hu Li, **Hongsheng Wang**, Haiying Dong Lanzhou Jiaotong University, China
09:45-10:00	(AE7105) Comparative Analysis of CPO-LSTM and PSO-LSTM for Wind Energy Power Forecasting **Xin Wen**, Zhuoqun Li, Huijie Yi, Xiang Dou, Maomao Yuan, Wenchu Xue Lanzhou Jiaotong University, China
10:00-10:15	(AE9849) Effect of Sinusoidal Hill on the Wake of Wind Turbines Arranged at Different Positions **Hao Peng**, Zhuoqun Li, Haohao Zhou, Rui Chen, Pengfei Wang, Shuailin Feng Lanzhou Jiaotong University, China
Best Presentation Award & Session Group Photo	

Session 4- Mechatronic and Electrical Equipment Design and Development Chairperson: Feitian Ran, Lanzhou Jiaotong University, China	
Time: 10:30-12:30, December 1st, 2024	Room: 百合厅/6F
*Note: The schedule of each presentation is for reference only. Authors are required to attend the whole session, in case there may be some changes on conference day. Please join in the room 5-10 minutes earlier.	
10:30-10:45	(AE1982) Experimental study on Wind Turbine Inflow Based on LiDAR **Hongtao Niu**, Congxin Yang, Wenjie Liu and Nianxi Yue Lanzhou University of Technology, China
10:45-11:00	(AE1805) Research on Electromagnetic Ammunition Ramming Mode Based on Linear Switched Reluctance Motor **Tong Wu**, Guoqing Liu, Rong Liang, Zhixiang Shi, Lei Liu Northwest Institute of Mechanical and Electrical Engineering, China
11:00-11:15	(AE5491) Fault Diagnosis of Wind Turbine Bearings in New Energy Systems based on MR-DCA Method **Yucen Yuan**, Wei Wei Lanzhou Jiaotong University, China
11:15-11:30	(AE007E) Comparison of Errors in Electromechanical Transient Simulation and Electromechanical Electromagnetic Hybrid Simulation Based on Commutation Failure **Wencheng Zhang**, Yilang Jiang, Libo Zhang, Jingqi Yang, Zhida Su China Electric Power Research Institute Ltd., China
11:30-11:45	(AE1489) V2G-based Predictive Control Strategy for On-Board Bi-Directional Converter Front Stage AC-DC Models **Yongquan Zhang**, Weidong Xue, Aijun Tian, Bin Yang, Haiying Dong Lanzhou Jiaotong University, China
11:45-12:00	(AE4691) Load Forecasting Method for Electric Vehicles Based on CNN-GRU-Attention Model **Xingping Yan**, Di Huang, Zhengxian Zheng, Weiyan Zheng, Peijun Chen Zhejiang Dayou Industrial Co., Ltd., China
12:00-12:15	(AE8811) Research on the Structural Design and Basin Characteristics of Pilot Electromagnetic Valves for New Energy Wastewater Treatment Systems Na Wang, **Yueyang Dong**, Xiaofei Zhen, Ruonan Jiao, Haoran Fu, Yuying Chen Lanzhou Jiaotong University, China
12:15-12:30	(AE7272) Automatic Solar Pepper Picker Design **Jie Zhao**, Xiaofei Zhen Lanzhou Jiaotong University, China
Best Presentation Award & Session Group Photo	

Session 5- Control Model and Electrical Performance Analysis in New Power System Chairperson: Wanjun Sun, Lanzhou Jiaotong University, China	
Time: 10:30-12:30, December 1st, 2024	Room: 水仙厅/6F
*Note: The schedule of each presentation is for reference only. Authors are required to attend the whole session, in case there may be some changes on conference day. Please join in the room 5-10 minutes earlier.	
10:30-10:45	(AE0660) Model Predictive Power Control of Grid-Connected Converter Based on Double-Vector Modulation **Yunzhao Wu**, Guanglin Sha, Qing Duan, Wanxing Sheng, Qianfan Zhou, Yi Zhong State Grid Corporation of China
10:45-11:00	(AE3259) Construction of a One Map Model for Intelligent Evaluation of Distribution Networks Integrating Multiple Entities and Attributes Guangru Zhang, Haodong Ren, Wenxi Zhen, Xiping Ma, **Lipeng Wang**, Haiying Dong Lanzhou Jiaotong University, China
11:00-11:15	(AE2867) Research and Implementation of Temperature Field Display System for Multi-Dimensional Transformer Model Meng Gao, Sicheng Zhao, Kun Li, **Baicun Guo**, Ran Zhuo, Jun Liu, Kui Xu, Feng Gao, Ying Hou, Yang Li Xi'an Jiaotong University, China
11:15-11:30	(AE7528) Time-frequency Characteristics of External Breaking Vibration of Distribution Cable Trench **Lisheng Chen**, Jialin Wang, Rongze Niu, Qingjiang Huang, Linchang Mei, Guoming Ma, Hongyang Zhou North China Electric Power University, China
11:30-11:45	(AE4047) Transient Assessment of Power Systems Based on Graph Attention Networks **Chen Zhou**, Chong Shao, Xin He, Ruhai Hao, Hongsheng Wang, Haiying Dong Lanzhou Jiaotong University, China
11:45-12:00	(AE7835) Hot Spot Simulation of 35kV Oil-Immersed Transformer Based on Ultrasonic Emission **Tinghui Li**, Zhiyong Xue, Xiangze An, Yunhao Li, Dongxin He Shandong University, China
12:00-12:15	(AE8857) Suppression of Multi-parallel PCS Zero-sequence Circulation without Midpoint Potential Coupling **Di Xie**, Longyun Kang, JingJing Li, LiangLiang Wang, KeXiang He, Jigang Yao, Haining Wang South China University of Technology, China
12:15-12:30	(AE9958) Fractional Order Sliding Mode CLLC Resonant Converter Based Strategy **Weidong Xue**, Yongquan Zhang, Aijun Tian, Bin Yang, Haiying Dong Lanzhou Jiaotong University, China
Best Presentation Award & Session Group Photo	

Session 6- New Energy Systems and Energy Networks Chairperson: Yilang Jiang, China Electric Power Research Institute Ltd., China	
Time: 10:30-12:30, December 1st, 2024	Room: 和舜厅/6F
*Note: The schedule of each presentation is for reference only. Authors are required to attend the whole session, in case there may be some changes on conference day. Please join in the room 5-10 minutes earlier.	
10:30-10:45	(AE0941) Wide-band Aggregated Impedance Modeling of Multivariate New Energy Clusters in the Frequency Domain Honglei Xu, Yong Yang, Jinggeng Gao, Hu Li, **Qixi Wang** Lanzhou Jiaotong University, China
10:45-11:00	(AE9818) Research on Key Equipment Technology for V2G **Yingying Cai**, Ran Zhang, Hao Yuan, Wentao Lu NARI Technology Nanjing Control Systems Co., China
11:00-11:15	(AE1809) Research and Analysis on the Performance of Embedded Heat Pipe Solar Phase Change Accumulator Considering Different Phase Change Materials **Taotao Wang**, Xiaofei Zhen, Haiming Yan, Yujun Xiao, Mei Liu, Weijia Li Lanzhou Jiaotong University, China
11:15-11:30	(AE2745) Optimized Allocation of Energy Supply Systems for Near-Zero Energy Buildings in Northwest China **Mei Liu**, Xiaofei Zhen, Taotao Wang, Haiming Yan, Yujun Xiao, Weijia Li Lanzhou Jiaotong University, China
11:30-11:45	(AE2005) Prediction of Gasoline Flash Point Based on Deep Learning **Hongwei Shen**, Qi'an Li LiaoNing Petrochemical University, China
11:45-12:00	(AE3141) Design of Envelope Structures for Existing Nearly Zero Energy Buildings in the Northwest Region **Yujun Xiao**, Xiaofei Zhen, Haiming Yan, Taotao Wang, Mei Liu, Weijia Li Lanzhou Jiaotong University, China
12:00-12:15	(AE3551) Wideband Impedance Characterization of Energy Storage within a Diversified New Energy Cluster Honglei Xu, Yong Yang, Jinggeng Gao, Hu Li, **Zhekai Xu** Lanzhou Jiaotong University, China
12:15-12:30	(AE6620) Impact of Carbon Trading Price Parameters on the Optimization of Integrated Energy System **Zixing Fang**, Zhuoqun Li, Hanbo Hu, Bo Zhao Lanzhou Jiaotong University, China
Best Presentation Award & Session Group Photo	

Session 7- Novel Electrical Design and Device Development Chairperson: Huan Pan, Ningxia University, China	
Time: 13:30-15:15, December 1st, 2024	Zoom ID: 851 0303 0735 https://us02web.zoom.us/j/85103030735
*Note: The schedule of each presentation is for reference only. Authors are required to attend the whole session, in case there may be some changes on conference day. Please join in the room 5-10 minutes earlier.	
13:30-13:45	(AE1126) Optimized Pulse Patterns Applied to Three-Level Inverter Based on Extended Newton-Raphson-based Optimizer Algorithm **Bowen Wang**, Shunfeng Yang, Jiahao Hu, Yudong Guan, Zhi Yang, Mengxuan Liu Southwest Jiaotong University, China
13:45-14:00	(AE1461) Dual-Frequency Wireless Power Transfer System Based on Asymmetric Phase-shift Following Control **Zhehui Zhu**, Wei Zhou, Ruikun Mai CRRC Times Electric Co., LTD, China
14:00-14:15	(AE2662) Research on Coordinated Control Strategy of Cascade Voltage Source Converter **Qinghua Kuang** Yanshan University, China
14:15-14:30	(AE2871) Model Predictive Control of a New MRAS Observer for PMSM Jincheng Jiang, Hong Wang, Yuansheng Li, Wei Xia, Dongnan Zhao, Xin Han, **Yanwei Fu**, Xiaowei He and Shibo Cong Pinggao Group Co.,Ltd, China
14:30-14:45	(AE3123) A New Design Of High Frequency Current Sensor Based on Degaussing Technology **Zhigang Ding**, Yu Xia, Yulong Ma, Shuyan Pan, Guanghui Xu, Ruhua Liu and Fanfan Ma, Yichi Zhang NARI Group Corporation (State Grid Electric Power Research Institute), China
14:45-15:00	(AE3335) Model Architecture and Simulation Analysis of Direct-Drive Wind Turbines Connected to Weak Power Grids **Peng Xu**, Wei Zhao, Fuqiang Li, Dongye Li, Haoyu Qi North China Branch of State Grid Corporation of China
15:00-15:15	(AE7782) Research on the Influence of Three phase Voltage Imbalance on the Low Voltage Side of Ultra high Voltage Single phase Transformers **Tao Tong**, Peng Wang, Tangbing Li, Hua Wan, Yan Liu, Bichuan Xu, Yang Liu Jiangxi Electric Power Research Institute of State Grid, China
Best Presentation Award & Session Group Photo	

Session 8- Advanced Electronic Technology and Integrated Energy System Chairperson: Zhongbei Tian, University of Birmingham, UK	
Time: 15:30-17:30, December 1st, 2024	Zoom ID: 851 0303 0735 https://us02web.zoom.us/j/85103030735
*Note: The schedule of each presentation is for reference only. Authors are required to attend the whole session, in case there may be some changes on conference day. Please join in the room 5-10 minutes earlier.	
15:30-15:45	(AE0374) Research on Durham University's Solar Panel Car battery performance of 2023 World Solar Car Competition based on SOC-OCV curve **Yunpeng Wei**, Zhixing Liu Durham University, UK
15:45-16:00	(AE0958) Power Flow Calculation and Optimization Control of Microgrid with High Penetration of Grid-Forming Distributed Generators Xiaobin Zhang, **Dianbo Wang**, Lin Shi and Yu Wang Xi 'an University of Technology, China
16:00-16:15	(AE1443) A Multi-heat Source Idendification Method based on Integrated Energy Systems Jia Cao, Yuanyuan Yi, Weiqiang Hu, Gang Lei, **Boqiang Li**, Zengbin Wu Shandong University, China
16:15-16:30	(AE3821) Application and Development of Lead-Carbon Battery in Electric Energy Storage System Chunguang Tian, Xiangdong Meng, Dexin Li, Haifeng Zhang, Yifu Zhang, **Gang Li** Jilin University, China
16:30-16:45	(AE6514) Research on Switch Driving Circuit of Full Electronic Interlocking System **Zichen Zhu**, Qingwen Luan, Meiyan Zhang, Zhiqiang Li, Ping Wang CRRC Qingdao Sifang Rolling Stock Research Institute Co., Ltd, China
16:45-17:00	(AE6832) Intelligent Operation and Maintenance Technology for High-Voltage Switches based on Internal Characteristic Inversion Yingting Luo, **Shuai Zhang**, Junfei Jiang and Zaixing Peng China South Power Grid International Co.,LTD., China
17:00-17:15	(AE0864) Research on the Influence of Weather on Solar Vehicles Based on the Comparison of Telemetry Data and Simulation Data **Zhixing Liu**, Yunpeng Wei Durham University, UK
17:15-17:30	(AE7620) Research on Power Quality Composite Disturbance Recognition Based on Deep Learning **Liao Di** State Grid Qinghai Electric Power Research Institute, China
Best Presentation Award & Session Group Photo	