

Special Session XV

Special Session Basic Information:

专栏题目 Session Title

中文：高比例新能源电力系统保护与控制关键技术
英文：Key Technologies for Protection and Control for Power Systems
With High Penetration of Renewables

专栏介绍和征稿主题 Introduction and topics

中文：高渗透率新能源、高比例电力电子以及超/特高压直流输电已成为新型电力系统的主要特征。然而，在电力电子设备非线性时变受控及弱馈特性影响下，电网故障过程发生本质变化，以往基于同步发电机故障及暂态特征的电力系统保护与控制技术已不完全适用，电力系统安全稳定面临严峻挑战。因此，刻画电力系统故障时空分布特征，辨识电力系统异常工况及运行风险，挖掘多源异构电力电子设备主动支撑能力，是需要重点研究的关键方向。本专题旨在为相关研究者提供交流讨论平台，特别关注人工智能技术在电力系统保护与控制领域中的融合应用，在数据利用、模型构建和应用推广等方面进行充分探讨。

英文：High penetration of renewable energy, high proportion of power electronic devices, and ultra-high/high-voltage DC transmission have become the main characteristics of the new power system. However, under the influence of the nonlinear time-varying control and weak-feed characteristics of power electronic devices, the power grid fault process has undergone fundamental changes. Traditional protection and control technologies for power systems, which were based on synchronous generator faults and transient characteristics, are no longer fully applicable, posing severe challenges to the security and stability of the power system. Therefore, characterizing the spatiotemporal distribution of power system faults, identifying abnormal operating conditions and risks in power systems, and exploring the active support capabilities of multi-source heterogeneous power electronic devices are critical research directions. This session aims to provide a platform for researchers to exchange and discuss ideas, with special attention given to the integration and application of artificial intelligence technologies in the field of power system protection and control. In-depth discussions on data utilization, model construction, and application promotion will be encouraged.

Special Session Chair(s):



Name	Zhe Lv
Prefix	Lecture
Department	Department of Electrical and Electronic Engineering
Organization	North China Electric Power University
City/Region	Beijing
Email	lvzhee@126.com

Organizer's Brief Biography

中文：吕哲，华北电力大学电气与电子工程学院讲师、硕士生导师，新型电力系统保护与控制王增平教授团队，新能源电力系统全国重点实验室固定研究人员。博士毕业于清华大学电机系（2020-2024），导师为孙宏斌院士。主要从事新型电力系统线路保护，动态电压稳定分析与控制。主持国家自然科学基金青年基金项目1项、智能电网国家科技重大专项子课题2项、中国博士后面基金项目1项等。以第一/通讯作者发表SCI/EI高水平论文16篇（1篇入选高引证TOP1%论文），获2024年省部级科技进步二等奖、中国知网高被引学者等荣誉。

英文：Zhe Lv, a Lecturer and Master's Supervisor at the School of Electrical and Electronic Engineering, North China Electric Power University, is a core member of the New Power System Protection and Control research team led by

Professor Zengping Wang and a permanent researcher at the State Key Laboratory of Alternate Electrical Power System with Renewable Energy Sources. He earned his Ph.D. from the Department of Electrical Engineering at Tsinghua University (2020–2024), under the supervision of Academician Hongbin Sun. His research primarily focuses on line protection for new power systems, as well as dynamic voltage stability analysis and control. He has led several research projects, including one funded by the National Natural Science Foundation of China (NSFC) Program, two sub-projects under the Smart Grid-National Science and Technology Major Project, and one project supported by the China Postdoctoral Science Foundation. As the first or corresponding author, he has published 16 high-quality papers indexed in SCI/EI, one of which has been recognized as a Top 1% Highly Cited Paper. His achievements include receiving a second Scientific and Technological Progress award at the provincial/ministerial level in 2024, and being named a Highly Cited Scholar by China National Knowledge Infrastructure (CNKI).



Name	Yue Yu
Prefix	Office Director
Department	Department of Power System Research
Organization	China Electric Power Research Institute
City/Region	Beijing
Email	yuyue2010@epri.sgcc.com.cn

Organizer's Brief Biography

中文：余越，硕士毕业于华北电力大学，博士毕业于中国电力科学研究院，长期从事电力系统继电保护原理、运行整定及控制技术研究，形成了适应大规模新能源接入的交流保护原理、继电保护整定计算建模及短路电流计算技术等核心成果。作为课题负责人或项目骨干参加国家科技重大专项、国家重点研发计划及国家自然科学基金项目 5 项，发表 SCI/EI 检索论文 40 余篇，获省部级奖励 8 项。

英文：Yue Yu, she earned her master's degree from North China Electric Power University and her Ph.D. from the China Electric Power Research Institute. She has long been dedicated to research on power system relay protection principles, operational setting, and control technologies. Her work has yielded key achievements, including AC protection principles adapted to large-scale renewable energy integration, relay protection setting calculation modeling, and short-circuit current calculation techniques. As a project leader or key member, she has participated in five national-level research initiatives, including National Major Science and Technology Projects, National Key R&D Programs, and projects supported by the National Natural Science Foundation of China. She has also published more than 40 papers indexed by SCI or EI, and received 8 Scientific and Technological Progress awards at the provincial/ministerial-level.



Name	Jiawei He
Prefix	Associate Researcher, Doctoral Supervisor
Department	School of Electrical and Information Engineering
Organization	Tianjin University
City/Region	Tianjin
Email	hejiawei_tju@126.com

Organizer's Brief Biography

中文：何佳伟，入选中国科协“青年人才托举工程”、中国电工技术学会优博论文，第2完成人获天津市科技进步特等奖、中国电工技术学会科技进步一等奖，第3完成人获天津市技术发明特等奖。主持国家自然科学基金3项（面上、青年、重点课题）、天津市科技重大专项项目1项、国家科技重大专项子课题1项。第一/通讯发表SCI论文40余篇，EI期刊论文20余篇。出版英文专著1部，授权国家发明专利20余项。担任中国电机工程学会继电保护专委会委员、中国电工技术学会电力系统保护与控制专委会委员。

英文：Jiawei He, selected for the Young Elite Scientists Sponsorship Program by the China Association for Science and Technology, awarded the Excellent Doctoral Dissertation Award by the China Electrotechnical Society, the 2nd finisher received the Special Prize of Science and Technology Progress Award of Tianjin Municipality and the First Prize of Science and Technology Progress Award of the China Electrotechnical Society, while the 3rd finisher received the Special Prize for Technological Invention of Tianjin Municipality. He has led three projects funded by the National Natural Science Foundation (including General, Young Scientists, and Key Projects), one Tianjin Science and Technology Major Project, and one sub-project under the National Science and Technology Major Project. He has published over 40 SCI papers and more than 20 papers in EI journals as the first author or corresponding author. He has also published one English monograph and holds over 20 authorized national invention patents. He serves as a committee member of the Relay Protection Subcommittee of the Chinese Society for Electrical Engineering and the Power System Protection and Control Subcommittee of the China Electrotechnical Society.