

Special Session XIII

Special Session Basic Information:

专栏题目 Session Title

中文：气候与气象驱动的电力信息物理系统风险演化与安全调控
英文：Risk Evolution and Secure Dispatch of Cyber-Physical Power Systems Driven by Climate and Weather

专栏介绍和征稿主题 Introduction and topics

中文：在全球气候变化与新型电力系统加速建设背景下，高温、寒潮、台风、暴雨洪涝、冰冻雨雪等极端气象事件频发，对电力系统安全运行带来复杂外部扰动。与此同时，新能源、电力电子设备及信息通信技术的深度融合，使电力系统逐步演化为信息域与物理域深度交互的电力信息物理系统。气候长期变化与极端气象短时冲击不仅会引起源荷波动和设备性能变化，还可能诱发一次设备故障、通信中断、量测异常、保护及控制失效，并通过信息-物理耦合形成跨域传播和级联放大。本专栏聚焦气候与气象驱动下电力信息物理系统风险演化机理、态势推演、预测预警及主动安全调控，推动气候科学、气象科学与电力系统安全控制的交叉融合。

征稿主题包括但不限于：

- 1.气候变化及其电力系统风险影响建模；
- 2.极端气象时空演化与电力系统影响表征；
- 3.气象冲击下电力信息物理系统一二次耦合建模；
- 4.内外部风险交互影响、跨域传播与级联演化；
- 5.气候气象驱动的风险推演、评估与预测预警；
- 6.信息-物理异构资源风险支撑能力量化与协同配置；
- 7.气候与气象变化下的电力系统适应性规划；
- 8.面向风险演化的电力信息物理系统主动安全调控。

英文：Against the backdrop of global climate change and the accelerated development of new power systems, extreme weather events such as heat waves, cold waves, typhoons, heavy rainfall and flooding, and ice and snow storms are occurring more frequently, posing increasingly complex external disturbances to the secure operation of power systems. Meanwhile, the deep integration of renewable energy, power electronic devices, and information and communication technologies are driving power systems toward cyber-physical power systems characterized by close interactions between cyber and physical domains. Long-term climate change and short-term extreme weather impacts not only cause fluctuations in generation and load and changes in equipment performance, but may also induce primary equipment failures, communication outages, measurement anomalies, and protection and control failures. Through cyber-physical coupling, these disturbances can further lead to cross-domain risk propagation and cascading amplification. This special session focuses on risk evolution mechanisms, situation evolution and simulation, risk assessment and early warning, and proactive security control of cyber-physical power systems driven by climate and weather, aiming to promote interdisciplinary integration among climate science, meteorology, and power system security and control.

Topics of interest include, but are not limited to:

- 1.Climate change and its impacts on power system risk modeling;
- 2.Spatiotemporal evolution of extreme weather and characterization of its impacts on power systems;
- 3.Primary-secondary coupling modeling of cyber-physical power systems under weather disturbances;
- 4.Interactive triggering, cross-domain propagation, and cascading evolution of internal and external risks;
- 5.Climate- and weather-driven risk simulation, assessment, forecasting, and early warning;
- 6.Quantification of risk support capabilities and coordinated allocation of heterogeneous cyber-physical resources;
- 7.Adaptive planning of power systems under climate and weather changes;
- 8.Proactive security control of cyber-physical power systems considering risk evolution.

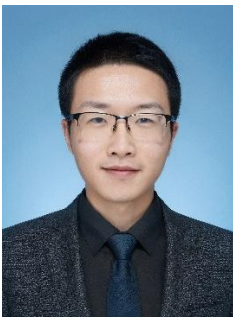
Special Session Chair(s):

	姓名	董申
	Name	Shen Dong
	称谓	助理研究员
	Prefix	Assistant Researcher
	部门	电气工程学院
	Department	College of Electrical Engineering
	单位	四川大学
	Organization	Sichuan University
	城市/地区	成都
	City/Region	Chengdu

Organizer's Brief Biography

中文：董申，博士，现为四川大学电气工程学院助理研究员，主要研究方向为面向极端事件的综合能源信息物理系统安全评估、调控以及电算协同。主持国家自然科学基金青年基金、博士后面上等国家级/省部级项目 3 项，参与包括国家重点研发计划、国家自然科学基金项目等科研项目 4 项，以第一/通信作者发表高水平期刊论文 10 余篇，授权发明专利 5 项。

英文：Shen Dong, Ph.D., is currently an Assistant Researcher with the College of Electrical Engineering, Sichuan University. His research interests include security assessment and control of cyber-physical energy systems under extreme events, as well as power-computing coordination. He has led three research projects, including the Young Scientists Fund of the National Natural Science Foundation of China, the General Program of the China Postdoctoral Science Foundation, and the Natural Science Foundation of Sichuan Province. He has also participated in four research projects, including the National Key R&D Program of China and projects funded by the National Natural Science Foundation of China. He has published more than ten high-quality journal papers as the first or corresponding author and has been granted five invention patents.

	姓名	古宸嘉
	Name	Chenjia Gu
	称谓	助理研究员
	Prefix	Assistant Researcher
	部门	电气工程学院
	Department	College of Electrical Engineering
	单位	四川大学
	Organization	Sichuan University
	城市/地区	成都
	City/Region	Chengdu

Organizer's Brief Biography

中文：古宸嘉现为四川大学电气工程学院助理研究员，研究方向包括新型电力系统规划与运行优化、电力系统气候适应性、人工智能算法及其应用等。他已发表 SCI/EI 收录论文 20 余篇，其中多篇发表于 *IEEE Trans* 系列高水平期刊。古宸嘉博士主持和参与了多项科研项目，包括国家重点研发计划，国家自然科学基金等，并多次受邀在国际学术会议上作报告。

英文：Chenjia Gu is an Assistant Researcher in the College of Electrical Engineering at Sichuan University. His research interests include planning and operational optimization of new-type power systems, climate adaptability of power systems, and artificial intelligence algorithms and their applications. He has published more than 20 SCI/EI-indexed journal and conference papers, with several appearing in high-impact IEEE Transactions series journals. Dr. Gu has led and participated in multiple research projects, including those supported by the National Key Research and Development Program of China and the National Natural Science Foundation of China. He has also been invited to deliver presentations at several international academic conferences.

	姓名	刘耕铭
	Name	Gengming Liu
	称谓	讲师
	Prefix	lecturer
	部门	电气与电子工程学院
	Department	College of Electrical and Electronics Engineering
	单位	华北电力大学
	Organization	North China Electric Power University
	城市/地区	北京
	City/Region	Beijing

Organizer’s Brief Biography

中文：刘耕铭，博士，现为华北电力大学电气与电子工程学院讲师，主要研究方向为攻防博弈视角下城市电力能源基础设施安全韧性、电力信息物理系统风险评估。主持国家自然科学基金青年项目 1 项、智能电网重大专项子课题 1 项，参与包括国家级国防重点课题、国家自然科学基金项目等科研项目 4 项，以第一/通信作者发表高水平期刊论文 10 余篇，授权发明专利 5 项。

英文：Gengming Liu, Ph.D., is currently a Lecturer with the College of Electrical and Electronics Engineering, North China Electric Power University. His research interests include resilience of urban power and energy infrastructure from the perspective of attack-defense game, as well as risk assessment of cyber-physical power systems. He has led research projects, including the Young Scientists Fund of the National Natural Science Foundation of China and the sub-project of Smart Grid National Science and Technology Major Project. He has also participated in four research projects, including National key defense research project and projects funded by the National Natural Science Foundation of China. He has published more than ten high-quality journal papers as the first or corresponding author and has been granted five invention patents.