

Special Session XIII

Special Session Basic Information:

专栏题目 Session Title

中文：“人工智能+高电压”：高电压现象与设备研究中的人工智能技术
英文：AI+HV: Artificial Intelligence Technology in the Research of High-Voltage Phenomena and Equipment

专栏介绍和征稿主题 Introduction and topics

中文：数智化是当下电力领域和行业发展的大势所趋。高电压与绝缘技术作为电气工程学科的主要研究方向之一也正在经历着传统技术与人工智能技术融合发展的过程，人工智能技术为高电压现象与设备的研究带来了新的活力。高电压与绝缘一直以来都是以试验作为学科基础，而今，智能模型与算法在数据分析中的优异表现、数字孪生在高电压设备运维与管理中的先进高效、计算机视觉在绝缘缺陷识别与诊断中的灵活运用、模式识别与具身智能在工程全过程中的提质赋能、机器学习和深度学习在高电压现象捕捉和机理阐释中的深度助力等都为高电压学科的发展提供了更多机遇。为此，本专题致力于为相关学者和科研人员提供一次学术交流和成果分享的平台，我们诚挚邀请共同探讨人工智能技术在高电压领域的研究和应用，期待您的投稿和精彩报告。本专题接受的稿件包含但不限于下述方向：

1. 高电压设备的数智化运维方法与技术；
2. 绝缘特征及缺陷的识别与诊断新技术；
3. 高电压工程多源异构数据的分析与处理；
4. 智能方法在放电等离子体中的应用；
5. 人工智能在电介质材料和储能系统中的应用。

英文：Digital and intelligent transformation is the prevailing trend in the development of the power industry and the broader energy sector. As a primary research area within electrical engineering, high-voltage and insulation technology is currently undergoing a process of integrating traditional methods with artificial intelligence. The introduction of AI has brought new vitality to the study of high-voltage phenomena and equipment.

Historically, the field of high voltage and insulation has been founded on experimentation. Today, however, it is presented with a wealth of new opportunities. The excellent performance of intelligent models and algorithms in data analysis, the advanced efficiency of digital twins in the operation and maintenance of high-voltage equipment, the flexible application of computer vision in identifying and diagnosing insulation defects, the role of pattern recognition and embodied intelligence in enhancing quality and empowering the entire engineering process, and the profound support of machine learning and deep learning in capturing high-voltage phenomena and elucidating their underlying mechanisms — all these factors are creating unprecedented opportunities for the advancement of the high-voltage discipline.

To this end, this special section is dedicated to providing a platform for academic exchange and sharing of research achievements among relevant scholars and researchers. We sincerely invite you to join us in exploring the research and applications of artificial intelligence in the high-voltage field. We look forward to your submissions and insightful presentations.

Topics for this special section include, but are not limited to, the following directions:

1. Digital and intelligent methods and technologies for the operation and maintenance of high-voltage equipment.
2. New technologies for the identification and diagnosis of insulation characteristics and defects.
3. Analysis and processing of multi-source heterogeneous data in high-voltage engineering.
4. Applications of intelligent methods in discharge plasma.
5. Applications of artificial intelligence in dielectric materials and energy storage systems.

Special Session Chair(s):

	姓名 Name	Chuyan Zhang
	称谓 Prefix	Dr., Associate Professor
	部门 Department	School of Artificial Intelligence
	单位 Organization	China University of Geosciences Beijing
	城市/地区 City/Region	Beijing
	邮箱 Email	zcy@cugb.edu.cn

Organizer's Brief Biography

中文：张楚岩，中国地质大学（北京）人工智能学院，副教授/博士生导师，学科带头人，本硕博均毕业于清华大学。中国电工技术学会高级会员、第九届理事会青工委委员；中国能源学会专家组成员。发表 SCI/EI 检索论文 50 余篇、主持各类科研项目三十余项。主要研究方向包括：电力系统高压外绝缘、AI+电气、电气测量与传感等。

英文：Chuyan Zhang is an Associate Professor, Doctoral Supervisor, and Discipline Leader at the School of Artificial Intelligence, China University of Geosciences (Beijing). A Senior Member of the China Electrotechnical Society (CES), he also serves on the CES's 9th Council Youth Working Committee and the Expert Panel of the China Energy Society. With a portfolio of over 30 led research projects, he has authored more than 50 papers. His primary research focuses on high-voltage external insulation for power systems, the application of AI in electrical engineering, and electrical measurement and sensing.

	姓名 Name	Xiaobo Meng
	称谓 Prefix	Dr., Professor
	部门 Department	School of Mechanical and Electrical Engineering
	单位 Organization	Guangzhou University
	城市/地区 City/Region	Guangzhou
	邮箱 Email	mengxb@gzhu.edu.cn

Organizer's Brief Biography

中文：孟晓波为广州大学“百人计划”教授、学术带头人、博士/硕士生导师。主持国家自然科学基金面上项目、广东省自然科学基金杰出青年项目、广东省自然科学基金青年项目和电网公司科技项目等 20 余项课题。第一/通讯作者发表 SCI 论文 32 篇，其中 IEEE trans 等领域顶级 SCI 期刊论文 25 篇，ESI 高被引论文 3 篇（1 篇同时入选 ESI 热点论文）。第一作者出版专著 1 部，第一发明人授权发明专利 12 项，参编行业/企业标准 3 项。获得广东省科技进步二等奖（第 1）、中国电力创新一等奖（第 2）、重庆市科技进步一等奖（第 5）等科技奖励。获得中国能源研究会优秀青年能源科技工作者、IEEE PES 直流电力系统技术委员会直流输变电设备技术分委会先进成员等荣誉。

英文：Meng Xiaobo serves as a professor under the "Hundred Talents Program" at Guangzhou University, an academic leader, and a supervisor for doctoral and master's students. He has taken the lead in over 20 research projects, encompassing general projects of the National Natural Science Foundation of China, Distinguished Young Scholar projects of the Guangdong Provincial Natural Science Foundation, Youth projects of the Guangdong Provincial Natural Science Foundation, and science and technology projects of power grid companies. As the first or corresponding author, he has published 32 SCI papers, 25 of which are in top - tier SCI journals such as IEEE Transactions, and 3 are ESI highly cited papers (1 of which is also an ESI hot paper). He has written 1 monograph as the first author, obtained 12 invention patents as the first inventor, and participated in the compilation of 3 industry/enterprise standards. He has been

awarded the Second Prize of the Guangdong Provincial Science and Technology Progress Award (first place), the First Prize of the China Electric Power Innovation Award (second place), the First Prize of the Chongqing Provincial Science and Technology Progress Award (fifth place), and other scientific and technological awards. He has been conferred the titles of Outstanding Young Energy Technology Worker of the China Energy Research Society and Advanced Member of the DC Power System Technology Committee of IEEE PES.

	姓名 Name	Hao Yang
	称谓 Prefix	Dr., Associate Professor
	部门 Department	School of Electronics and Information
	单位 Organization	Xi'an Polytechnic University
	城市/地区 City/Region	Xi'an
	邮箱 Email	yanghao@xpu.edu.cn

Organizer's Brief Biography

中文：杨昊，男，副教授，博士（后），硕士生导师，陕西省高校优秀青年人才。现担任高电压工程新技术研究中心主任，同时担任 IEEE PES 中国区高压绝缘技术委员会理事、陕西省电源学会理事、中国电工技术学会高级会员、中国电工技术学会科普传播专家、教育部学位中心学位论文评审专家；兼任 SCI 期刊“MDPI Energies”客座编辑，国家自然科学基金及国际 SCI 期刊 IEEE Trans. Dielectr. Electr. Insul.、Electrical Engineering 等通讯评审专家，以及《工程科学与技术》等期刊优秀审稿专家。近年来在电气工程领域发表学术论文 40 余篇（SCI 检索 10 余篇），先后主持/参与科研项目 20 余项，包括国家自然科学基金等纵向项目 5 项，参与 973 计划、国家电网总部科技项目等重要项目。

英文：Yang Hao is recognized as an Excellent Young Talent in Shaanxi Provincial Universities. He currently serves as the Director of the High Voltage Engineering New Technology Research Center and holds several concurrent academic positions. These include Director of the High Voltage Insulation Technology Committee of the IEEE PES China Section, Director of the Shaanxi Power Supply Society, Senior Member of the China Electrotechnical Society (CES), Popular Science Communication Expert of CES, and Dissertation Review Expert for the Academic Degrees Center of the Ministry of Education. Furthermore, he is a Guest Editor for the SCI journal *MDPI Energies* and serves as a review expert for the National Natural Science Foundation of China (NSFC) and various international SCI journals, such as *IEEE Transactions on Dielectrics and Electrical Insulation* and *Electrical Engineering*. He has also been recognized as an Excellent Review Expert for journals including *Engineering Science and Technology*. In recent years, he has published over 40 academic papers in electrical engineering, with more than 10 indexed in the Science Citation Index (SCI). He has led or participated in over 20 scientific research projects, including five national-level projects such as those funded by the National Natural Science Foundation of China. His involvement also extends to major national initiatives like the National Key Basic Research Program of China (973 Program) and the Headquarters Science and Technology Projects of the State Grid Corporation of China.