

Special Session XIV

Special Session Basic Information:

专栏题目 Session Title	中文：新能源并网先进输电技术 英文：Advanced transmission technology for renewable energy grid connection
专栏介绍和征稿主题 Introduction and topics	
<p>中文：在“双碳”目标引领下，新型电力系统建设进入攻坚阶段，高比例风电、光伏等新能源的大规模并网已成为能源转型的核心任务，其波动性、间歇性特征对输电技术的灵活性、稳定性与经济性提出了前所未有的挑战。先进输电技术作为破解新能源消纳瓶颈、保障电网安全稳定运行的关键支撑，是当前电气领域的研究热点与技术前沿，其中直流输电与柔性低频输电技术凭借独特的技术优势，发展迅速，成为适配新能源并网场景的核心技术路径。</p> <p>本分会聚焦直流输电与柔性低频输电两大核心技术方向，立足学术前沿与工程实际，系统梳理两项技术在新能源并网中的适配逻辑、技术瓶颈与优化路径，推动学术创新与工程应用的深度融合，为新型电力系统高质量发展提供技术支撑。</p> <p>分会研讨内容在直流输电技术方面，重点探讨柔性直流输电拓扑优化、功率控制、关键设备研发及工程应用；在柔性低频输电技术方面，深入研讨其频率优化机制、柔性控制策略、设备集成与系统组网特性。同时，对比直流输电技术与柔性低频输电技术的优劣，探索两种技术的适用场景。</p> <p>本分会将采用主题报告、专题研讨、学术交流形式，邀请国内外相关领域的知名专家、学者及工程技术人员，分享最新研究成果、工程实践经验与行业发展展望，深入剖析当前新能源并网先进输电技术面临的理论瓶颈与工程挑战，探讨技术标准化、设备国产化、运维智能化的发展方向，助力提升新能源消纳效率，保障新型电力系统的安全稳定与高效运行，为全球能源转型与“双碳”目标实现注入学术动力与技术活力。</p> <p>英文：Under the guidance of the "dual carbon" goal, the construction of a new power system has entered a critical stage, and the large-scale integration of high proportion wind power, photovoltaic and other renewable energy sources has become the core task of energy transformation. Its volatility and intermittency pose unprecedented challenges to the flexibility, stability and economy of transmission technology. Advanced transmission technology, as a key support for breaking the bottleneck of renewable energy consumption and ensuring the safe and stable operation of the power grid, is currently a research hotspot and technological frontier in the field of electrical engineering. Among them, high voltage direct current transmission and flexible low-frequency transmission technology have developed rapidly due to their unique technological advantages, becoming the core technological path for adapting to renewable energy grid-connected scenarios.</p> <p>This chapter focuses on the two core technology directions of direct current transmission and flexible low-frequency transmission, based on academic frontiers and engineering practice, systematically sorting out the adaptation logic, technical bottlenecks, and optimization paths of the two technologies in renewable energy grid connection, promoting the deep integration of academic innovation and engineering applications, and providing technical support for the high-quality development of new power systems.</p> <p>The special session will focus on the optimization of flexible DC transmission topology, power control, research and development of key equipment, and engineering applications in the field of DC transmission technology. In terms of flexible low-frequency transmission technology, the in-depth research will be conducted on its frequency optimization mechanism, flexible control strategy, equipment integration, and system networking characteristics. Meanwhile, compare the advantages and disadvantages of direct current transmission technology and flexible low-frequency transmission technology, and explore the applicable scenarios of the two technologies.</p>	

Special Session Chair(s):

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Organizer's Brief Biography

中文：邵冰冰，副教授，博士生导师，主要从事新能源电力系统稳定性分析与控制、新能源并网先进输电技术（直流、低频输电）研究。近年来，主持国家自然科学基金项目、博士后基金面上项目、智能电网国家科技重大专项子课题、国家重点实验室开放课题等项目。共发表论文 60 余篇，申请/授权发明专利 40 余项，参编国家标准 1 项、行业标准 2 项，获华北电力大学优秀博士学位论文奖、期刊/会议优秀论文/高影响力论文/最受关注论文 7 次，参与的《柔性低频交流输电技术、系列装备及应用》成果由中国电机工程学会鉴定为项目整体技术达到国际领先水平，承担 IEC TC 115 JWG 11 国内对口工作组成员、DL40/SC1 柔性低频输电分标委通讯委员、国际会议出版委员会主席/分会场主席、《Chinese Journal of Electrical Engineering》期刊青年编委等学术工作。

英文：Bingbing Shao, associate professor and doctoral supervisor, mainly engages in stability analysis and control of renewable energy power systems, as well as research on advanced transmission technologies for renewable energy grid connection (DC and low-frequency transmission). In recent years, he has presided over projects of the National Natural Science Foundation of China, general projects of the Postdoctoral Fund, sub projects of the National Science and Technology Major Project of Smart Grid, and open projects of State Key Laboratory. Published more than 60 papers, applied for/authorized more than 40 invention patents, participated in the compilation of 1 national standard and 2 industry standards, won the Excellent Doctoral Dissertation Award of North China Electric Power University, 7 Outstanding Papers/High Impact Papers/Most Popular Papers in Journals/Conferences, and participated in the achievement of "Flexible Low Frequency AC Transmission Technology, Series Equipment and Applications" which was identified by the Chinese Society of Electrical Engineering as the overall technology of the project reaching the international leading level. Undertook academic work such as being a member of the IEC TC 115 JWG 11 domestic counterpart working group, the Communication Committee of the DL40/SC1 Flexible Low Frequency Transmission Subcommittee, the Chairman/Sub venue Chairman of the International Conference Publishing Committee, and the Youth Editorial Board Member of the Chinese Journal of Electrical Engineering.

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Organizer's Brief Biography

中文：陆振纲，教授级高级工程师、硕导，主要研究方向为灵活交流输电配电技术及其应用，现任中国电力科学研究院电力电子所专业总师，入选首批国家电网青年人才托举工程（科技类），中国电机工程学会高级会员、IEEE PES 及 PELS 会员，IEC SC22F ahG2/ahG7、IEEE P2745 UPFC 及 IEEE P2825 SSSC 系列国际标准工作组成员，电力行业柔性低频输电技术标准化分委会秘书长、IEEE PES（中国）柔性交流输电技术分委会秘书长、大电网运行技术分委会常务理事，北京电力电子学会青年工作委员会委员；主持智能电网国家科技重大专项、国家重点研发计划课题 2 项、国家电网公司科技项目 3 项；作为专业负责人完成世界首台 10kV 统一电能质量控制器（UPQC）、220kV/330MVA 交交换流器、220kV UPFC 研制和我国首个优质电力园区建设，建成世界首个 220kV 柔性低频输电工程；获得电力科学进步一等奖 1 项，湖北/浙江省科技进步一等奖 2 项，中国电工技术学会科技进步二等奖 1 项、电力行业技术创新奖 1 项；发表论文 40 余篇，参编专著 2 部，授权发明专利 60 余项，参编 IEC、IEEE 等标准 5 项，主编国家标准 1 项、行标 1 项，参编标准 8 项。

英文：Zhengang Lu, a professor level senior engineer and master's supervisor, mainly researches flexible AC transmission and distribution technology and its applications. He is currently the professional chief engineer of the Power Electronics Institute of the China Electric Power Research Institute, selected as one of the first batch of National Grid Youth Talent Support Projects (technology category), a senior member of the Chinese Society of Electrical Engineering, a member of IEEE PES and PELS, a member of the IEC SC22F ahG2/ahG7, IEEE P2745 UPFC and IEEE P2825 SSSC series international standard working groups, the secretary general of the Standardization Subcommittee for Flexible Low Frequency Transmission Technology in the Power Industry, the secretary general of the IEEE PES (China) Flexible AC Transmission Technology Subcommittee, the executive director of the Large Power Grid Operation Technology Subcommittee, and a member of the Youth Working Committee of the Beijing Power Electronics Society; Hosted 2 national science and technology major projects and 2 national key research and development plan projects for smart grid, as well as 3 science and technology projects of State Grid Corporation of China; As the professional leader, completed the development of the world's first 10kV unified power quality controller (UPQC), 220kV/330MVA AC converter, 220kV UPFC, and the construction of China's first high-quality power park, and completed the world's first 220kV flexible low-frequency transmission project; Received 1 first prize in Electric Power Science Progress, 2 first prizes in Hubei/Zhejiang Province Science and Technology Progress, 1 second prize in China Electrotechnical Society Science and Technology Progress, and 1 technology innovation award in the electric power industry; Published over 40 papers, co-authored 2 monographs, granted over 60 invention patents, co authored 5 standards such as IEC and IEEE, edited 1 national standard and 1 industry standard, and co-authored 8 standards.

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Organizer's Brief Biography

中文：熊凌飞，教授级高级工程师，华北电力大学电力系统及其自动化专业博士毕业，现任国网经济技术研究院有限公司直流技术咨询中心换流站技术处处长，主要从事特高压柔直、海风柔直系统成套设计和交直流系统稳定性研究工作。

英文：Lingfei Xiong, a professor level senior engineer, graduated with a PhD in Power System and Automation from North China Electric Power University. He currently serves as the Director of the Converter Station Technology Department at the DC Technology Consulting Center of State Grid Economic and Technological Research Institute Co., Ltd. He is mainly engaged in the design of complete sets of ultra-high voltage flexible DC and sea breeze flexible DC systems, as well as research on the stability of AC/DC systems.