IEEE

IEEE POWER ELECTRONICS SOCIETY
Powering a Sustainable Future

PEDG 2025

The IEEE 16th International Symposium on Power Electronics for Distributed Generation Systems

2025 | June 22 – 25
Nanjing, China

CONTENTS

Welcome to PEDG 2025

Following the great success of the past fifteen years, the IEEE 16th International Symposium on Power Electronics for Distributed Generation Systems (PEDG 2025) will be held during June 22-25, 2025 in Nanjing, China.

This conference, sponsored by IEEE Power Electronics Society (PELS) and organized by the PELS Technical Committee on Sustainable Energy Systems, Nanjing University of Aeronautics and Astronautics, and Jiangsu Power Supply Society, will provide an international visible platform for presenting innovative and cut-edge results in the area of power electronics and distributed generation systems.

PEDG 2025 will feature plenary speeches, tutorials, panel sessions, industry sessions and regular technical sessions on theory, analysis, design, deployment and impact of power electronics for distributed generation, energy storage, and sustainable sources. Particular attention will be given to emerging approaches of configurations, controls, applications, and tests of renewable energy systems to achieve goals of decarbonization.

All of the conference papers will be EI-indexed and included in IEEE Xplore. Selected papers will have the prestigious opportunity to be considered for publication in special issues or sections of IEEE PELS journals, including JESTPE and TPEL. The Selection will be based on PEDG 2025 review scores and on feedback from participants to the presentation at the conference. Moreover, student travel grants and best papers awards will be provided.

Conference Committee

General co-chair

Prof. Xinbo Ruan

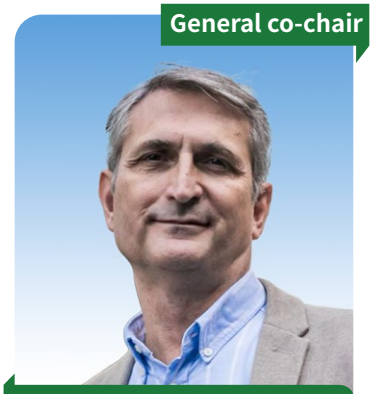
Local Organizer
Nanjing Univ. of Aero. & Astro., China

General chair

Prof. Ke Ma

Shanghai Jiao Tong University, China

General co-chair



Prof. Pedro Rodriguez

Luxembourg Inst. of Sci. & Tech., Luxembourg

Steering Committee

Deepak Divan	Georgia Tech, USA
Dehong Xu	Zhejiang University, China
Fred C. Lee	Virginia Tech, USA
Don Tan, E2 Systems	E2 Systems, USA
Leo Lorenz	European Center of Power Electronics, Germany
Liuchen Chang	University of New Brunswick, Canada
Frede Blaabjerg	Aalborg University, Denmark
Juan C. Balda	University of Arkansas, USA
Gerard Hurley	National Univ. of Ireland Galway, Ireland
Rik W.DeDoncker	RWTH Aachen University, Germany
Martin Ordonez	University of British Columbia, Canada
Denizar Cruz Martins	Fed. Univ. of Santa Catarina, Brazil
Johan Enslin	Clemson University, USA
Jinjun Liu	Xi'an Jiaotong University, China
Željko Jakopović	University of Zagreb, Croatia
Sudip K. Mazumder	University of Illinois Chicago, USA
Marco Liserre	Kiel University, Germany
Ke Ma	Shanghai Jiao Tong University, China
Pedro Rodriguez	Luxembourg Institute of Science and Tech.

Specially Invited Steering Committee Members

Sewan Choi	Seoul National Univ. of Sci. & Tech., Korea
Noriko Kawakami	Toshiba Mitsubishi-Electric Ind. Sys. Co., Japan
Johann W. Kolar	ETH Zurich, Switzerland
Yanfei Liu	Queen's University, Canada
Udaya Madawala	University of Auckland, New Zealand
Adel Nasiri	University of South Carolina, USA
Alex Huang	University of Texas at Austin, USA
Yaow-Ming Chen	National Chung-Cheng University, Taiwan China
Tsorng-Juu Liang	National Cheng Kung University, Taiwan China
Chi K. Tse	City University of Hong Kong, China
Yunwei Li	University of Alberta, Canada
Fred Wang	University of Tennessee at Knoxville, USA
Bradley Lehman	Northeastern University, USA

Organization Committee

Technical Program

Hongfei Wu	Nanjing University of Aeronautics and Astronautics, China
Subhash Bhattacharya	North Carolina State University, USA
Giampaolo Buticchi	University of Nottingham Ningbo, China
Rolando Burgos	Virginia Tech, USA
Xiong Du	Chongqing University, China
Drazen Dujic	EPFL, Switzerland
Feng Gao	Shandong University, China
Hua Geng	Tsinghua University, China
Junichi Itoh	Nagaoka University of Technology, Japan
Georgios Konstantinou	University of New South Wales, Australia
Dong-Choon Lee	Yeungnam University, Korea
Wuhua Li	Zhejiang University, China
Hong Li	Beijing Jiaotong University, China
Heng Wu	Aalborg University, Denmark
Zhikang Shuai	Hunan University, China
Haoyu Wang	Shanghai Tech University, China
Xiongfei Wang	KTH Royal Institute of Technology, Sweden
Dongsheng Yang	Technical University of Eindhoven, Netherlands
Miao Zhu	Shanghai Jiao Tong University, China
Xibo Yuan	China University of Mining and Technology, China
Samir Kouro	Universidad Técnica Federico Santa María, Chile
Marcelo Lobo Heldwein	Technical University of Munich, Germany
Teng Long	Cambridge University, UK

Tutorial

Xin Chen	Nanjing Univ. of Aero. & Astro., China
Shenghui Cui	Shenghui Cui, Seoul National University, Korea

Local Arrangements

Pengwei Chen	Nanjing Univ. of Aero. & Astro., China
Lihong Xie	Nanjing Univ. of Aero. & Astro., China

Organization Committee

Publication

Weiyang Zhou	Nanjing Univ. of Aero. & Astro., China

Publicity

Jun Jiang	Nanjing Univ. of Aero. & Astro., China

Finance

Fei Liu	Nanjing Univ. of Aero. & Astro., China

Special Session

Jinming Xu	Nanjing University of Aeronautics and Astronautics, China
Wu Chen	Southeast University, China
Tomislav Dragičević	Technical University of Denmark, Denmark
Dong Dong	Virginia Tech, USA
Yunjie Gu	Imperial College London, UK
Giovanni De Carne	Karlsruhe Institute of Technology, Germany

Secretary-General

Jingxin Hu	Nanjing Univ. of Aero. & Astro., China

Social Events

Welcome Reception

Time	Sunday,June 22,2025,18:00-19:30
Venue	1F / TianQue Ballroom A+B

Young Professionals & Women in Engineering Reception

Time	Sunday,June 22,2025,19:30-21:00
Venue	5F / Executive Lounge

Social Event

Time	Monday,June 23,2025,19:00-21:00
Venue	Yangtze River Cruise (Depart from Wuma Ferry Cruise Terminal)
Activity	Dinner and cruise sightseeing
Note	Bus will departure and drop off at Hilton Nanjing Niushoushan

Banquet & Award Ceremony

Time	Tuesday,June 24,2025,18:30-21:00
Venue	1F / TianQue Ballroom A+B

Campus Tour

Time	Wednesday,June 25,2025,13:30-16:30
Venue	Nanjing University of Aeronautics and Astronautics
Activity	Visit the campus and laboratories
Note	Bus will departure at Hilton Nanjing Niushoushan

Conference Venue

Conference Venue

Venue Hilton Nanjing Niushoushan
（南京牛首山希尔顿酒店）

Address No. 8 Ningdan Ave., Jiangning Dist. Jiangsu Province, Nanjing, 211100, China
（南京市江宁区宁丹大道8号）

Sign-in

Spot 1F / TianQue Ballroom Foyer
（天阙厅序厅）

Time 10:00am - 5:00pm June 22, 2025

Transportation

Nanjing Lukou International Airport

- 33 kilometers away from the venue, approximately 35 minutes by car

Nanjing South Railway Station

- 12 kilometers away from the venue, approximately 20 minutes by car

Nanjing Railway Station

- 25 kilometers away from the venue, approximately 40 minutes by car

Floor Plan

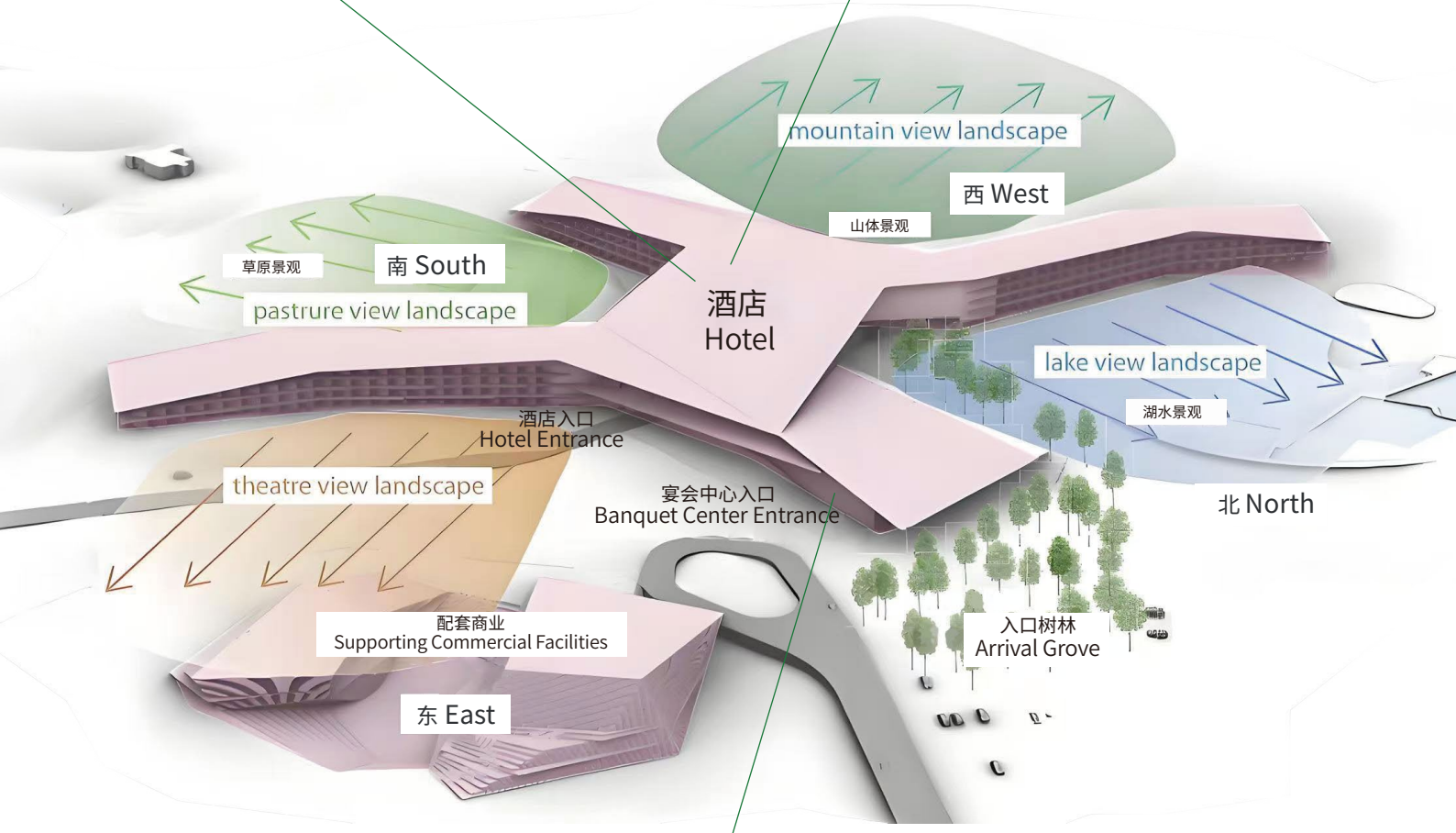
CONFERENCE ROOM

Level	Meeting Room	22-Jun	23-Jun	24-Jun	25-Jun
1F	TianQue Ballroom Foyer	★	★	★	★
1F	TianQue Ballroom A+B		★	★	★
1F	YanLan Ballroom A	★	★	★	
1F	YanLan Ballroom B	★	★	★	
2F	DaGuan Conference Room A	★	★	★	
2F	DaGuan Conference Room B	★	★	★	
2F	DaGuan Conference Room C		★	★	

Floor Plan

4F Lobby (check in)
Kitchen Craft All Day Dinning

5F Executive Lounge



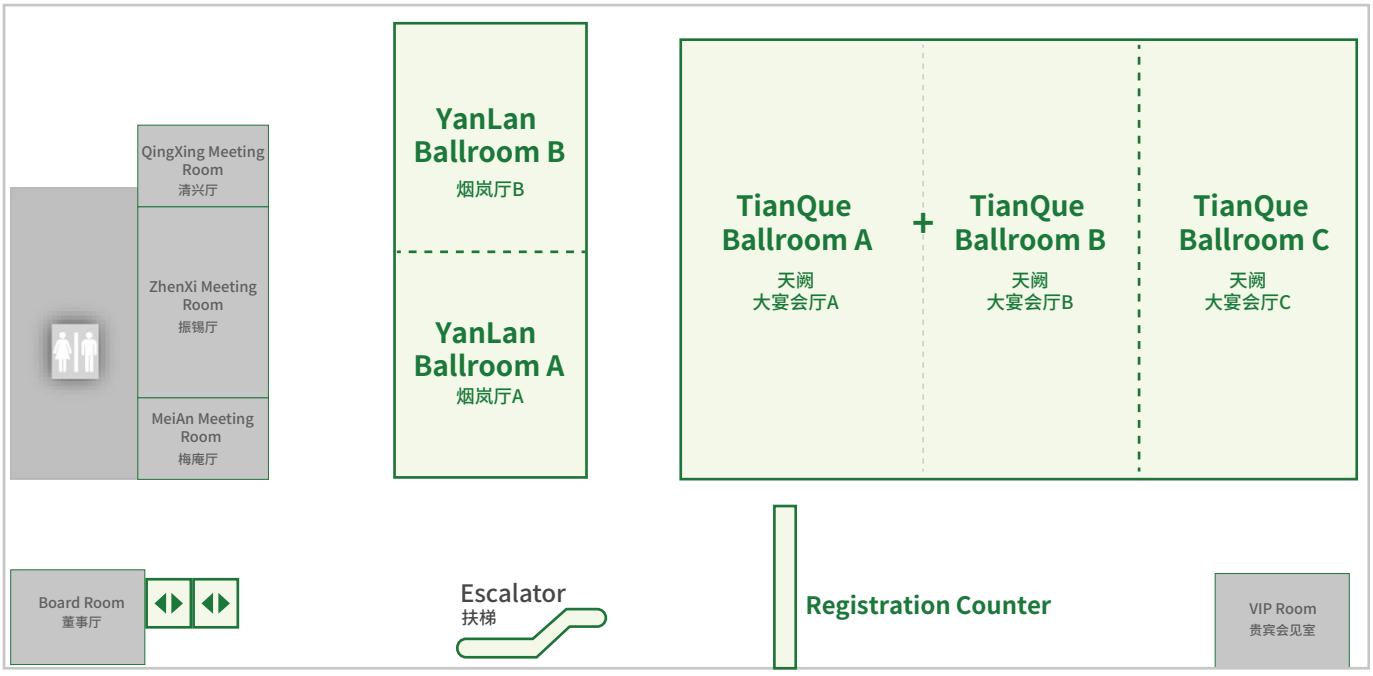
Conference Center

1F Registration Counter
TianQue Ballroom
YanLan Ballroom

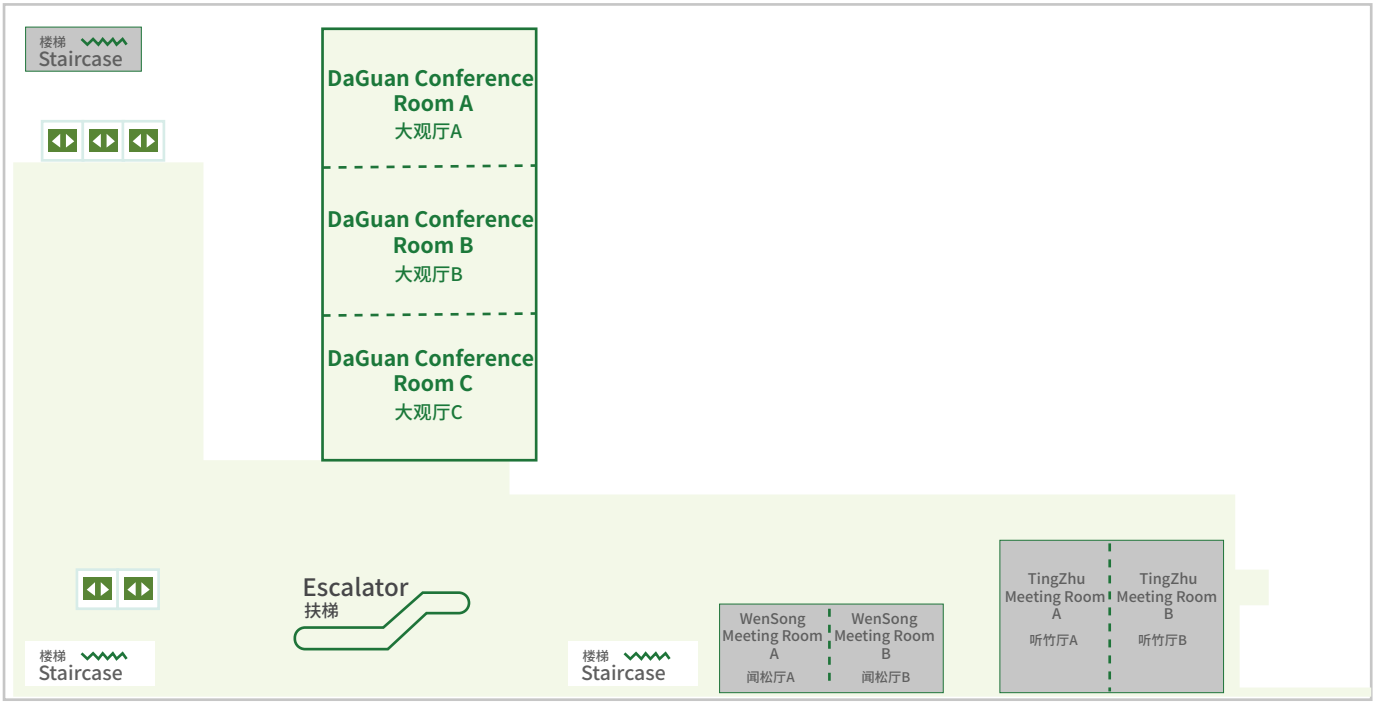
2F DaGuan Conference Room

Floor Plan

1F Floor Plan



2F Floor Plan



Guidelines

For Presentation

Oral Presentation

- The duration of a presentation slot is 20 minutes. Please target your lecture for a duration of about 15 minutes for the presentation plus about 5 minutes for questions from the audience.
- Your punctual arrival and active involvement in each session will be highly appreciated.
- Get your presentation PPT or PDF files prepared and backed up.
- Laptops, projector & screen, laser sticks will be provided by the conference organizer.

Poster Presentation

- It's expected that at least one author stands by the poster for (most of the time of) the duration of the poster session. This is essential both to present your work to anyone interest in it and to make sure that your presence is verified by committee.

Name Badge

- For security purposes, delegates, speakers, exhibitors and staff are required to wear their name badge to all sessions and social functions. Entrance into sessions is restricted to registered delegates only. If you misplace your name badge, please replace at the registration counter.

Reminder

- Please remember to take all personal belongings with you whenever you leave a conference room or public area. Do not leave bags or laptops unattended.
- Please silence your cell phones during presentations or sessions to minimize the disruptions.

Conference Agenda Overview

June 22,2025-Sunday

10:00-17:00		Sign-in	TianQue Ballroom Foyer @ 1F
09:00-12:00	Tutorial 1	Frequency-Domain Stability Methods for Power Electronics in Decarbonized Grids	YanLan Ballroom A
	Tutorial 2	Challenges for Mission-Profile-Based Testing and Evaluation for Reliability of Power Electronics	YanLan Ballroom B
	Tutorial 3	Towards Intelligence and Digitalization in Solar Photovoltaic Systems	DaGuan Conference Room A
	Tutorial 4	System Model Based Optimal Composite Control for Power Electronic Conversion - An Intuitive Perception	DaGuan Conference Room B
12:00-14:00		Lunch Break	TianQue Ballroom C
14:00-17:00	Tutorial 5	Resonances with Grid-Forming Converters: Causes,Damping and DC-link Dynamics	YanLan Ballroom A
	Tutorial 6	On Medium-Voltage SiC devices-—Reliability, Application and Impact on Grid	YanLan Ballroom B
	Tutorial 7	High Efficiency High Current Ultrafast XPU Power Supply for Next Generation Data Centers	DaGuan Conference Room A
	Tutorial 8	Converter-Driven Stability Issues and Solutions in Power Electronics Defined Power Systems	DaGuan Conference Room B
18:00-19:30		Welcome Reception	TianQue Ballroom A+B
19:30-21:00		Young Professionals & Women in Engineering Reception	Executive Lounge

Conference Agenda Overview

June 23,2025-Monday

	08:30-09:00	Opening Ceremony		TianOue Ballroom A+B
Keynote speech	09:00-09:30	Power System Stability with A High Penetration of Inverter-Based Resources	**Tim Green** Imperial College London, UK	TianQue Ballroom A+B
	09:30-10:00	Operating Points of AC Variables as Prerequisites to Understanding System Dynamics	**Xiaoming Yuan** Huazhong University of Science and Technology, China	
	10:00-10:30	Coffee Break		Foyer
Keynote speech	10:30-11:00	Analytical Perspectives on Grid-Forming Control	**Xiongfei Wang** KTH Royal Institute of Technology, Sweden	TianOue Ballroom A+B
Panel Session	11:00-12:00	Grid-Forming Technology	**Jinjun Liu** Xi'an Jiaotong University, China **Pedro Rodriguez** Luxembourg Institute of Science and Technology, Luxembourg	TianQue Ballroom A+B
	12:00-13:30	Lunch		TianQue Ballroom C
Technical Session	13:30-15:30	T01	Distributed Generation	DaGuan Conference Room A
		T02	Grid-Forming Converters	DaGuan Conference Room B
Special Session		S01	Converter-Based Distribution Systems	DaGuan Conference Room C
		S02	Artificial Intelligence Applications	YanLan Ballroom A
Industry Session		I01		YanLan Ballroom B
	15:30-15:50	Coffee Break		Foyer
Technical Session	15:50-17:50	T03	High-Power Converters	DaGuan Conference Room A
		T04	DC-AC Converters	DaGuan Conference Room B
		T05	Modeling and Control	DaGuan Conference Room C
Special Session		S03	Grid-Forming Technology - I	YanLan Ballroom A
		S04	Renewable Energy Based DC Grids	YanLan Ballroom B
Poster Session		P01	Grid-Connected Converter	DaGuan Conference Room Foyer
		P02	Energy Storage Systems	DaGuan Conference Room Foyer
	18:00-21:00	Social event		Yangtze River Cruise

Conference Agenda Overview

June 24,2025-Tuesday

Keynote speech	09:00-09:30	DC Distribution Grids - Key Enabler for A CO2 Neutral Energy Supply Based on Renewable Power Source	**Rik W. De Doncker** RWTH Aachen University, Germany	TianQue Ballroom A+B
	09:30-10:00	Advanced Conversion Solutions for DC Power Distribution Networks	**Drazen Dujic** Swiss Federal Institute of Technology in Lausanne(EPFL), Switzerland	
	10:00-10:30	Coffee Break		Foyer
Keynote speech	10:30-11:00	Evolutionary Trends in Power Supply for AI Data Centers	**Zhaozheng Hou** ,Director, Department of Technology and Platform Planning,Huawei Digital	TianOue Ballroom A+B
Panel Session	11:00-12:00	DC Grid Technology	**Dehong Xu** Zhejiang University, China **Guobing Song** Xi'an Jiaotong University, China **Shouxiang Wang** Tianjin University,China	TianQue Ballroom A+B
	12:00-13:30	Lunch		TianQue Ballroom C
Technical Session	13:30-15:30	T06	Power Quality	DaGuan Conference Room A
		T07	Power Electronics Devices and Components	DaGuan Conference Room B
Special Session		S05	Transportation Electrification	DaGuan Conference Room C
		S06	Active Distribution Systems	YanLan Ballroom A
Industry Session		I02		YanLan Ballroom B
	15:30-15:50	Coffee Break		Foyer
Technical Session	15:50-17:50	T08	DC-DC Converters	DaGuan Conference Room A
		T09	Resonant Converters	DaGuan Conference Room B
		T10	Wireless Power Transfer System	DaGuan Conference Room C
Special Session		S07	Grid-Forming Technology - II	YanLan Ballroom A
		S08	Energy Storage Systems	YanLan Ballroom B
Poster Session		P03	Power Converters	DaGuan Conference Room Foyer
		P04	Emerging Topics For Distributed Generation	DaGuan Conference Room Foyer
	18:30-21:00	Banquet & Award Ceremony		TianQue Ballroom A+B

Conference Agenda Overview

June 25,2025-Wednesday				
	08:30-09:00	Closing		TianOue Ballroom A+B
Keynote speech	09:00-09:30	AC/DC Microgrids - a Modern Solution for Grid Challenges in DERs, EVs and AI Data Centers	**Ryan（Yunwei）Li** University of Alberta,Canada	TianQue Ballroom A+B
	09:30-10:00	Utility-Scale Energy Storage - Challenges and Opportunities for Power Electronics	**Richard Zhang** Virginia Polytechnic Institute and State University,USA	
	10:00-10:30	Coffee Break		Foyer
Keynote speech	10:30-11:00	Photonically Controlled Power Semiconductor Devices for Smart Grid	**Sudip K. Mazumder** University of Illinois Chicago, USA	TianOue Ballroom A+B
Panel Session	11:00-12:00	Energy Storage and Hydrogen Technology	**Ke Ma** Shanghai Jiao Tong University,China **Samir Kouro** Universidad Tecnica Federico Santa Maria,Chile	TianQue Ballroom A+B
	12:00-13:30	Lunch		TianQue Ballroom C
	13:30-16:30	Campus Tour		Nanjing University of Aeronautics and Astronautics

Keynote Speakers

Chair: Prof. Xinbo Ruan, Nanjing University of Aeronautics and Astronautics, China

Time: 09:00-09:30 June 23, 2025

Venue: 1F / TianQue Ballroom A+B

Prof. Tim Green

Imperial College London, UK

- **Power System Stability with A High Penetration of Inverter-Based Resources**

Abstract

The transformation of power grids that replaces fossil fuels with renewables also sees the replacement of electro-mechanical machines by inverter-based resources (IBR). This raises any challenges in ensuring continued safe and secure operation of the power system. The transformation implies that IBR must now take on the role of supplying all of the system services that system operators use to manage the grid. A revision of the definitions of system services is need to enable system operators to analyse the type and volume of service needed. This will be explored through examples of frequency containment and small-signal system strength.

The transformation to IBR-dominated grids is also fundamentally changing the dynamics and stability properties of grids leading to the emergence of new threats to stability that arise from new dynamics and the interactions of dynamics that were previously considered decoupled. IBR have both faster dynamics than traditional machines and dynamics that are defined by proprietary, and therefore black-box, software. System operators therefore face a challenge in assuring stability when full physics-based models are not available. Recently we have shown that whole-system impedance spectrum models can yield rich information on the root-cause of poorly damped modes. Such models can be extracted from black-box time-domain models or from measurement of the physical system. This talk will describe so-called grey-box models, their application to mitigating poorly damped modes and to assessment of system strength.

The replacement of synchronous machines by IBR also changes the response to short-circuit faults and calls into question the design of protection systems. A discussion will be given on changes to protection design and IBR design that will be needed to ensure continued effective operation.

Biography

Tim Green (Fellow, IEEE) is a Professor of Electrical Power Engineering and has been at Imperial College since 1994. He holds Ph.D. from Heriot-Watt University. He is a Fellow of the Royal Academy of Engineering and Fellow of the Learned Society of Wales. Tim’ s research interest is in formulating the future form of energy systems to support zero carbon futures. A particular theme is how the flexibility of power electronics and new forms of control systems will be important steps to achieving very high penetrations of renewable energy in net-zero energy systems. He and his team work on new methods of stability analysis for grids of inverter-based resources such as wind, solar and batteries. He has also worked on High Voltage DC technology and holds seven patents in this area jointly with GE Grid Solutions. He is a proponent of power electronics for the management of voltage and power flow in low-voltage networks such as partnering UK Power Networks for trials of “soft open points” in London and Brighton. His present focus is on how use measurement data to construct system models of inverter-dominated grids and to provide from that root-cause analysis of potential instabilities.

Keynote Speakers

Chair: Prof. Xinbo Ruan, Nanjing University of Aeronautics and Astronautics, China

Time: 09:30-10:00 June 23, 2025

Venue: 1F / TianQue Ballroom A+B

Prof. Xiaoming Yuan

Huazhong University of Science and Technology, China

◆ Operating Points of AC Variables as Prerequisites to Understanding System Dynamics

Abstract

Dynamics in any physical systems shall always be associated with monotonous or oscillatory energy flow and therefore analytics of dynamics shall inevitably be built on understandings of energy carrying bodies and the properties, which have historically and unconsciously been challenges for AC systems. Methods across diversified disciplines with the majority recourse to harmonics based impedance approaches which due to the sophisticated connections to the energy flow driven dynamics will see indispensable limitations even for small disturbances scenario. It is discovered that in an AC system each source/load or line component will store real and imaginary energy on its own mechanism and will be interacting to each other under the constraint of independent real and imaginary power conservation determining dynamics and stability of the system, which will be prerequisites for methods to be developed and given the present dilemma in the grid of China will have to be understood and applied.

Biography

Prof. Xiaoming Yuan (Senior Member, IEEE) received the B.Eng. degree from Shandong University, China, in 1986, the M.Eng. degree from Zhejiang University, China, in 1993, and the Ph.D. degree from the Federal University of Santa Catarina, Florianopolis, Brazil, in 1998, all in electrical engineering.,He was with Qilu Petrochemical Corporation, China, from 1986 to 1990, where he was involved in the commissioning and testing of relaying and automation devices in power systems, adjustable speed drives, and high-power UPS systems. From 1998 to 2001, he was a Project Engineer with the Swiss Federal Institute of Technology Zurich, Zurich, Switzerland, where he worked on flexible-AC-transmission-systems and power quality. From 2001 to 2008, he was with GE GRC Shanghai as the Manager of the Low Power Electronics Laboratory. From 2008 to 2010, he was with GE GRC US as an Electrical Chief Engineer.

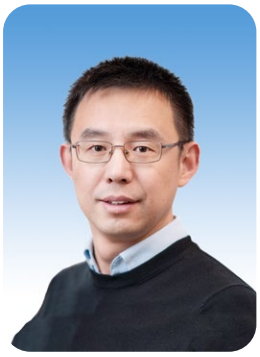
He has been a Full Professor with the Huazhong University of Science and Technology, since 2011. He is a pioneer in the area of dynamics of power electronics dominated large power systems, and he developed the “amplitude/frequency modulation theory” for analyzing dynamics of general ac power systems. Prof. Yuan is also a Distinguished Expert of National Thousand Talents Program of China and the Chief Scientist of National Basic Research Program of China (973 Program). He received the First Prize Paper Award from the Industrial Power Converter Committee of the IEEE Industry Applications Society, in 1999.

Keynote Speakers

Chair: Prof. Xinbo Ruan, Nanjing University of Aeronautics and Astronautics, China

Time: 10:30-11:00 June 23, 2025

Venue: 1F / TianQue Ballroom A+B



Prof. Xiongfei Wang

KTH Royal Institute of Technology, Sweden

◆ Analytical Perspectives on Grid-Forming Control

Abstract

As power systems accelerate toward deep power electronics integration, grid-forming capabilities are becoming essential for converter-based resources, DC transmission networks, and large active loads. Recent years have seen a surge of interest in grid-forming control designs. This keynote presents analytical insights into the robust design of grid-forming control, addressing critical capability requirements while enhancing small-signal stability and large-disturbance resilience. The emerging convergence between robust grid-following and grid-forming paradigms is explored by recent advances and case studies. The talk concludes by highlighting open questions and research challenges critical to shaping reliable, converter-driven power systems of the future.

Biography

Prof. Xiongfei Wang (Fellow, IEEE) received the B.S. degree from Yanshan University, Qinhuangdao, China, in 2006, the M.S. degree from the Harbin Institute of Technology, Harbin, China, in 2008, both in electrical engineering, and the Ph.D. degree in energy technology from Aalborg University, Aalborg, Denmark, in 2013. From 2009 to 2022, he was with Aalborg University where he became an Assistant Professor in 2014, an Associate Professor in 2016, a Professor and the Founding Leader of Electronic Power Grid (eGRID) Research Group in 2018. From 2022, he has been a Professor with KTH Royal Institute of Technology, Stockholm, Sweden, and a Part-time Professor with Aalborg University. From 2023, he has been a Visiting Professor with Hitachi Energy Research Center, Vasteras, Sweden. His research interests include modeling and control of power electronic converters, stability and power quality of power-electronic-dominated power systems, and high-power electronic systems. Dr. Wang was the recipient of ten IEEE Prize Paper Awards, the 2016 AAU Talent for Future Research Leaders, the 2018 IEEE Richard M. Bass Outstanding Young Power Electronics Engineer Award, the 2019 IEEE PELS Sustainable Energy Systems Technical Achievement Award, and the 2022 Isao Takahashi Power Electronics Award. He is an Executive Editor (Editor-in-Chief) for IEEE Transactions on Power Electronics Letters and an Associate Editor for IEEE Journal of Emerging and Selected Topics in Power Electronics.

Keynote Speakers

Chair: Prof. Pedro Rodriguez, Luxembourg Institute of Science and Technology, Luxembourg

Time: 09:00-09:30 June 24, 2025

Venue: 1F / TianQue Ballroom A+B

Prof. Rik W. De Doncker

RWTH Aachen University, Germany

- **Flexible DC Distribution Grids - Key Enabler for a CO2 Neutral Energy Supply Based on Renewable Power Sources**

Abstract

The liberalization of the energy market has significantly impacted the entire structure of the energy supply system. In addition, partially due to a strong commitment of governments to reduce CO2 emissions, vast amounts of renewable, dispersed, but volatile power generator systems (mostly wind and PV) are being installed.

To cope with this new landscape of dispersed, volatile generation, several measures must be taken to provide a robust and secure energy supply of electrical energy. In particular, next to fully automated demand side management systems, all sorts of energy storages (in form of heat, cold, gas and batteries) and more flexible grid structures are needed. This presentation explores the potentials of DC technologies in distribution systems to realize the energy transition.. The role and prospects of state-of-the-art power electronic substations and protection gear, a key enabling technology to realize a modern energy supply system, is discussed.

Biography

Rik W. De Doncker, (M'87-SM'99-F'01) received his Ph.D. degree in electro-mechanical engineering from the KULeuven, Belgium. In 1987, he was appointed Visiting Associate Professor at the University of Wisconsin, Madison, where he invented the DAB converter. In 1988, he joined the GE Corporate Research and Development Center, Schenectady, NY. In November 1994, he joined Silicon Power Corporation (formerly GE-SPCO) as Vice President Technology, developing world's first medium-voltage static transfer switch. Since Oct. 1996, he is professor at RWTH Aachen University, Germany, where he leads the Institute for Power Electronics and Electrical Drives (ISEA). Oct. 2006 he was appointed director of the E.ON Energy Research Center at RWTH Aachen University, where he leads the Institute of Power Generation and Storage Systems. Since 2014, he is director of the German Federal Government BMBF Flexible Electrical Networks (FEN) Research CAMPUS.

He has a doctor honoris causa degree of TU Riga, Latvia. He has published over 800 technical papers and is holder of more than 60 patents. Dr. De Doncker is recipient of the IAS Outstanding Achievements Award, the 2013 Newell Power Electronics IEEE Technical Field Award, and the 2014 IEEE PELS Harry A. Owen Outstanding Service Award. In 2015 he was awarded Fellow status at RWTH University. In 2016 he became member of the German Academy of Science and Technology (ACATECH). 2020 he received the IEEE Medal in Power Engineering.

Keynote Speakers

Chair : Prof. Pedro Rodriguez, Luxembourg Institute of Science and Technology, Luxembourg

Time : 09:30-10:00 June 24, 2025

Venue : 1F / TianQue Ballroom A+B

Prof. Drazen Dujic

Swiss Federal Institute of Technology in Lausanne(EPFL), Switzerland

◆ Advanced Conversion Solutions for DC Power Distribution Networks

Abstract

Despite the widespread adoption of alternating current (AC) systems for over a century, direct current (DC) technology continues to offer significant advantages in various applications. Advancements in power semiconductors and power electronics systems have enabled the realization of previously unimaginable systems. While DC is widely utilised in high-voltage (HV) bulk power transmission and numerous low-voltage (LV) applications, its potential and benefits remain largely unexplored in the medium-voltage (MV) domain. This is primarily due to the absence of readily available and standardized high-power conversion and protection technologies for DC systems. The purpose of this presentation is to provide an overview of DC applications and their specific requirements, encompassing various technologies such as advanced power electronics converters (DC-DC, DC-AC, AC-DC), protection coordination, protection equipment, and comprehensive system analysis and modelling.

Biography

Drazen Dujic (Fellow, IEEE) is an Associate Professor and Head of the Power Electronics Laboratory at EPFL. He received the Dipl. Ing. and MSc degrees from the University of Novi Sad, Novi Sad, Serbia in 2002 and 2005, respectively, and the PhD degree from Liverpool John Moores University, Liverpool, UK in 2008. From 2003 to 2006, he was a Research Assistant with the Faculty of Technical Sciences at the University of Novi Sad. From 2006 to 2009, he was a Research Associate with Liverpool John Moores University. After that, he moved to industry and joined ABB Switzerland Ltd, where from 2009 to 2013, he was a Scientist and then Principal Scientist with ABB Corporate Research Center in Baden-Dättwil, and from 2013 to 2014 he was R&D Platform Manager with ABB Medium Voltage Drives in Turgi. He has been with EPFL since 2014. His research interests include the areas of design and control of advanced high-power electronic systems and high-performance drives, predominantly for medium voltage applications related to electrical energy generation, conversion, and storage. In 2024, he received the Istvan Nagy Award; in 2018, he received the EPE Outstanding Service Award, and in 2014, the Isao Takahashi Power Electronics Award for Outstanding Achievement in Power Electronics. He is an IEEE Fellow.

Keynote Speakers

Chair: Prof. Pedro Rodriguez, Luxembourg Institute of Science and Technology, Luxembourg

Time: 10:30-11:00 June 24, 2025

Venue: 1F / TianQue Ballroom A+B

Mr.Zhaozheng Hou

Director, Department of Technology and Platform Planning, Huawei Digital Power

◆ Evolutionary Trends in Power Supply for AI Data Centers

Abstract

The artificial intelligence market is experiencing unprecedented prosperity, China's AI computing power market is expected to reach $33.7 billion by 2026. In the face of future evolution demands, data security, and the high energy consumption of megawatt-level data centers, a secure and reliable architecture becomes very important. This presentation will discuss three dimensions: flexible scalability, safety and reliability, and high efficiency and energy saving. It will explore multiple future evolution directions from 10KV to AI chip power supply links.

Biography

Zhaozheng Hou is the Director of Technology and Platform Planning Department at Huawei Digital Power. He is responsible for the planning and development of three generations of technologies and platforms for Huawei digital power products and solutions, and for the construction of innovative 4T (watt, heat, battery, and bit) technologies. Mr. Hou has led the construction of successive generations of ICT, new-type power system and industrial control chips, power packaging, power devices, and Psip technology research and development. He has driven the industrialization of these technologies, achieving mass production and shipments on a scale of hundreds of millions of units. Additionally, he holds over 60 authorized patents both domestically and internationally. Currently, he serves as a member of the Power Electronics Committee of the China Electrotechnical Society, a member of the Electronics Components and Devices Committee of the China Power Supply Society, and the Huawei Digital Power representative of the Power Electronics Committee of the China Electric Power Promotion Council.

Keynote Speakers

Chair: Prof. Samir Kouro, Universidad Tecnia Federico Santa Maria, Chile

Time: 09:00-09:30 June 25, 2025

Venue: 1F / TianQue Ballroom A+B

Prof. Ryan（Yunwei）Li

University of Alberta, Canada

- **AC/DC Microgrids - A Modern Solution for Grid Challenges In DERs, EVs and AI Data Centers**

Abstract

Under the global push for an energy transition toward a more sustainable future, today’s grid is encountering increasing challenges. These challenges include the integration of more distributed energy resources (DERs) with intermittent characteristics; the rapid expansion of electric vehicles (EVs) requiring infrastructure for fast EV charging; and the significant power demands of data centers driven by artificial intelligence (AI) technologies. This presentation explores hybrid AC/DC microgrid structures as an innovative solution for addressing these challenges. It highlights how such microgrids facilitate the integration of DERs, support fast EV charging infrastructure, and enhance the efficiency and reliability of modern data centers. Key advancements and emerging trends in electricity grids enabled by hybrid AC/DC microgrid solutions are discussed, with a particular focus on novel structural designs, advanced converter technologies, power and energy management control strategies, and robust grid support mechanisms. These developments aim to accommodate today’s evolving electrical loads while contributing to a more resilient and adaptable electric grid.

Biography

Prof. Ryan Li (Fellow, IEEE) is an University of Alberta Senior Engineering Research Chair, and Chair of the Department of Electrical and Computer Engineering. He received the Bachelor degree from Tianjin University, China, in 2002, and PhD degree from the School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore, in 2006. In 2005, Dr. Li was a Visiting Scholar with Aalborg University, Denmark. From 2006 to 2007, he was a Postdoctoral Research Fellow in the Department of Electrical and Computer Engineering, Toronto Metropolitan University, Canada. Dr. Li also worked at Rockwell Automation Canada as a R&D Engineer, before he joined University of Alberta in 2007. Dr. Li currently serves as the Vice President for Products of IEEE Power Electronics Society (PELS). He was the Editor-in-Chief for IEEE Transactions on Power Electronics Letters 2019-2023. He also served as Associate Editor for IEEE Transactions on Power Electronics, IEEE Transactions on Industrial Electronics, IEEE Transactions on Smart Grid, and IEEE Journal of Emerging and Selected Topics in Power Electronics. Dr. Li was the general chair of IEEE Energy Conversion Congress of Exposition (ECCE) in 2020. He is the AdCom Member at Large for IEEE Power Electronics Society (PELS) 2021-2023. Dr. Li received the Nagamori Foundation Award in 2022 and the Richard M. Bass Outstanding Young Power Electronics Engineer Award from IEEE PELS in 2013. He is a Fellow of IEEE, a Fellow of Canadian Academy of Engineering, and recognized as the Clarivate Highly Cited Researcher.

Keynote Speakers

Chair: Prof. Samir Kouro, Universidad Tecnia Federico Santa Maria, Chile

Time: 09:30-10:00 June 25, 2025

Venue: 1F / TianQue Ballroom A+B

Prof. Richard Zhang

Virginia Polytechnic Institute and State University, USA

- **Utility-Scale Energy Storage – Challenges and Opportunities for Power Electronics**

Abstract

As the world gets more electrified, energy storage is becoming a crucial enabler for numerous applications, such as mobile electronic devices and EVs. This presentation will examine various energy storage technologies driven by a diverse range of fast-growing applications, such as EV charging, data centers, and microgrids. A special focus is given to utility-scale energy storage options, along with their challenges and opportunities on power electronics technologies, to enable the grid of the future and a broader electrified green infrastructure.

Biography

Prof. Richard Zhang (Fellow, IEEE) received the B.S. and M.S. degrees in electrical engineering from Tsinghua University, Beijing, China, in 1989 and 1993, respectively, and the Ph.D. degree from Virginia Polytechnic Institute and State University, Blacksburg, VA, USA, in 1998. He is an Executive with the General Electric Company. He has been leading the GE Power Conversion product platform organization in China since mid-2014. He had been the Global Technology Leader with GE Power Conversion based in Paris, France, and was responsible for global new product development in power electronics, rotating machines, and control automation for three years from 2011 to 2014. Before that, he had been with GE Oil & Gas as the Global Electrification Leader for three years in Shanghai, China, leading the development of high power drives for oil and gas applications. He was with the GE Global Research Center in Niskayuna, NY, USA, for ten years from 1998 to 2008, during which he was the Laboratory Manager of the Electronic Power Conversion Laboratory since 2001. While at the GE Global Research Center, he led power electronics research, serving all GE industrial businesses. Dr. Zhang won the Best Paper Award from the IEEE Transactions on Power Electronics and one IEEE Industry Applications Society prize paper award. He served as an Associate Editor for the IEEE Transactions on Power Electronics and as an IEEE Power Electronics Society Adcom member. He is also currently serving as the Chairman of the Industry Advisory Board for the Center for Power Electronics Systems.

Keynote Speakers

Chair : Prof. Samir Kouro, Universidad Tecnia Federico Santa Maria, Chile
Time : 10:30-11:00 June 25, 2025
Venue : 1F / TianQue Ballroom A+B

Prof. Sudip K. Mazumder

University of Illinois Chicago, USA

- **Photonically Controlled Power Semiconductor Devices for Smart Grid**

Abstract

Photonically controlled power semiconductor device and electronics is a game changing technology in power electronics. With the advent of new wide and ultra-wide bandgap materials (e.g., SiC, GaN, Ga2O3, diamond, AlN, c-BN), semiconductor devices for power electronics are beginning to switch at progressively higher speeds and higher voltages. The impact of such near impulse actuation and the resulting impact on reliability (e.g., due to high EMI, high dynamic voltage and current stress) can be potentially better handled by photonics. Yet another emerging threat for power electronics is intentional adversarial intrusion (e.g., due to electromagnetic side channel noise intrusion) where photonics can provide tangible benefit. This plenary talk will provide an overview of plurality of interesting photonically controlled device and electronics technologies.

Biography

Dr. Sudip K. Mazumder is a Distinguished Professor, Robert Uyetani Professor of Engineering, and the Director of Laboratory for Energy and Switching-Electronic Systems (LESES) at the University of Illinois Chicago. He is a Joint Appointee with the U. S. Argonne National Laboratory. He also serves as the President of NextWatt LLC since 2008. He has over 30 years of professional experience and has held R&D and design positions in leading industrial organizations, and has served as technical consultant for several industries. He is a Fellow of 3 societies including IEEE. Currently, he serves as the Deputy Editor-in-Chief for IEEE Journal of Emerging and Selected Topics in Power Electronics, Chair of PELS Technical Committee on Modeling and Control, and Member at Large for IEEE PELS. Previously he served as an IEEE Distinguished Lecturer and the Editor at Large for IEEE Transactions on Power Electronics

Panel Session Speakers

Time : 11:00-12:00 June 23, 2025
Venue : 1F / TianQue Ballroom A+B

chair : Prof. Jinjun Liu

Prof. Jinjun Liu

- Xi' an Jiaotong University, China

Prof. Pedro Rodriguez

- Luxembourg Institute of Science and Technology, Luxembourg

Time : 11:00-12:00 June 24, 2025
Venue : 1F / TianQue Ballroom A+B

chair : Prof. Dehong Xu

Prof. Dehong Xu

- Zhejiang University, China

Prof. Guobing Song

- Xi' an Jiaotong University, China

Prof. Shouxiang Wang

- Tianjin University, China

Time : 11:00-12:00 June 25, 2025
Venue : 1F / TianQue Ballroom A+B

chair : Prof. Ke Ma

Prof. Ke Ma

- Shanghai Jiao Tong University, China

Prof. Samir Kouro

- Universidad Tecnica Federico Santa Maria, Chile

Tutorials

Tutorial 01 Frequency-Domain Stability Methods for Power Electronics in Decarbonized Grids

Time：09:00-12:00 June 22, 2025

Venue：1F / YanLan Ballroom A

Jian Sun

Rensselaer Polytechnic Institute, USA

Abstract

Since the first publication about 15 years ago, the immittance-based frequency-domain stability modeling and analysis methods have served as the foundation for small-signal stability study of power electronics in ac power systems. Stability problems addressed by the methods are assumed to occur at the grid interface of individual converters. The converter-grid system model used by the methods resembles a single-input-single-output (SISO) feedback loop, and stability is assessed by applying the Nyquist criterion to the loop gain. Through aggregation, the methods can also be applied to clusters of converters sharing a common point of interconnection with the grid, such as in the case of wind and PV farms. The methods have enabled the analysis and mitigation of different practical grid integration problems in renewable energy and high-voltage dc (HVDC) transmission systems, including subsynchronous and supersynchronous resonance involving wind and solar power generation plants connected to different types of grids (weak grid, series-compensated grid, or offshore grid with HVDC connection to onshore network), as well as high-frequency resonance involving HVDC converters.

The development of renewable energy in recent years has been driven by the need to decarbonize the electricity grids as the first step towards net-zero emission and carbon-neutral economy that many countries and regions target to achieve between 2050 and 2060. The massive deployment of converter-based generation together with increasing use of converter-based transmission, distribution, and consumption is fundamentally changing the characteristics of the grid. With the ubiquitous presence of converters, their impact on overall power system stability has become a major concern for grid operators. Stability analysis based on SISO system models addresses stability of individual converters with the grid and does not consider the complex behavior of converter-based power systems due to interactions and coupling among different converters. To address this new challenge, generalized immittance-based stability criteria based on multiple-input-multiple-output (MIMO) system models have been developed for power electronics in future decarbonized grids and are presented in this tutorial.

The tutorial is organized as follows: After a brief review of the general small-signal sequence immittance theory, modeling of converters as two-port networks is presented to include coupling between ac and dc ports as well as over frequency. The two-port converter models are then used to develop frequency-domain models in MIMO form with guaranteed open-loop stability for power systems with any number of converters, considering different types of grids (ac, dc, hybrid ac-dc) and including both grid-following and grid-forming converters as well as conventional generators. Frequency-domain stability analysis of MIMO models by the generalized Nyquist criterion is then explained along with frequency-domain modal analysis techniques to identify the source of instability problems in a complex network. The tutorial concludes with several examples of application in practical power systems.

Tutorials

Tutorial 02 Challenges for Mission-Profile-Based Testing and Evaluation for Reliability of Power Electronics

Time：09:00-12:00 June 22, 2025

Venue：1F / YanLan Ballroom B

Ke Ma

Shanghai Jiao Tong University, China

Menqi Xu

Zhejiang Lab, China

Shihao Xia

Shanghai Jiao Tong University, China

Abstract

Recently, power-electronics converters have gained popularity across various industries due to their enhanced power density and capacity. This has led to the development of increasingly complex mission profiles. Ensuring the safety and reliability of these converters necessitates the implementation of comprehensive testing and evaluation methodologies for power electronics components and systems prior to their deployment. However, conventional testing methods often yield loading behaviors that significantly deviate from those observed in practical applications, thereby compromising the ability to accurately reflect component and system failures under actual mission profiles. In light of these limitations, a more advanced testing and evaluation methodology, namely mission-profile-based testing and evaluation method for power electronics components/systems, has emerged. This approach diverges from conventional testing methods by incorporating real-field loading behaviors of power electronics components and systems.

However, the incorporation of actual mission profiles introduces novel challenges for mission-profile-based testing and evaluation methods. These challenges encompass the extraction of characteristic parameters under mission profiles, the thermal modeling of power electronics devices suitable for diverse mission profiles, and the recreation of real-field loading behaviors and control behaviors of power electronics components and systems. This tutorial aims to provide updates on the challenges of mission-profile-based testing and evaluation methods for reliability of power electronics. Feasible solutions for these challenges, including a more advanced thermal characterization method of power semiconductor devices based on an H-bridge testing circuit, a frequency-domain thermal model, and control algorithms specified for mission profile emulation, will be provided in order to obtain a trustworthy testing and evaluation result.

Tutorials

Tutorial 03 Towards Intelligence and Digitalization in Solar Photovoltaic Systems

Time：09:00-12:00 June 22, 2025

Venue：2F / DaGuan Conference Room A

Yongheng Yang

Zhejiang University, China

Sisi Zhao

Plexim GmbH, Switzerland

Shuo Yan

Program Manager
RMIT University, Australia

Abstract

Power electronics, as the essential interface, has been benefiting the development of renewable energy resources (RESs). Meanwhile, driven by the continuous decrease in the levelized cost of energy (LCoE), photovoltaic (PV) systems are widely integrated into the power grid to emphasize carbon neutrality. However, the high penetration level of PV systems raises concerns like grid instability due to intermittent power fluctuations, such as the frequency stability induced by the deficient mechanical inertia in power electronics interfacing RES integration. Accordingly, various attempts have been made to ensure grid-friendliness with a sharp proportion of PV energy to guarantee utility resilience and energy harvesting. Such a development happens both on the supply side with grid-supporting PV systems and on the demand side with smart load technologies. Beyond conventional passive integration, recent PV systems are required to act as active power sources, particularly, mitigating the adverse effects and providing intelligent controllability and flexibility as well, by leveraging digital technologies. In this context, power electronics-based solar PV systems are being of digitalization and intelligence, which, however, also brings challenges, under the era of artificial intelligence (AI). One of the big concerns is how to properly digitalize the entire energy system, ensuring data confidentiality, availability, and integrity while restraining the negative impact of cyber-threats, in order to develop advanced and smart control techniques. Additionally, testing of large-scale low-inertia power electronics systems is becoming of importance, which is a cost-efficient way to validate the control algorithms by integrating them into control hardware-in-the-loop (CHiL) and power hardware-in-the-loop (PHiL) systems. Yet, there is a dilemma to consider when performing simulations of massive power electronics: computation burdens and real-world-case representation accuracy (fidelity). With the above, the tutorial on Towards Intelligence and Digitalization in Solar Photovoltaic Systems is proposed to address and discuss these emerging issues seen from the academia and industrial perspectives.

In this tutorial, we will walk through the current technological challenges for digital and intelligent grid-integration of solar PV energy and look at different solutions. This tutorial is organized into three parts: I - Solar PV Energy Conversion and Power Electronics Technologies, II - Advanced and Intelligent Control for Large-Scale PV Systems, and III - Digitalization and High-fidelity Simulation of Massive Power Electronics Systems, covering the basics of solar PV energy conversion, advanced and RMIT Classification: Trusted intelligent control, and simulation technologies. The goal of this tutorial is to improve the functionality and manageability of grid-connected PV systems by advanced and intelligent controls and to achieve efficient and effective testing of algorithms for large-scale power electronics. As such, it is to ensure the sustainability, compatibility with the power grid, efficiency, and reliability of PV systems that adhere to grid regulations and help to reduce the LCoE for further integration. The tutorial is organized for intermediate and advanced audiences, engineers, and researchers seeking practical solutions towards intelligence and digitalization in solar PV power systems. The prerequisite is basic power electronics and control.

Tutorials

Tutorial 04 System Model Based Optimal Composite Control for PowerElectronic Conversion - An Intuitive Perception

Time：09:00-12:00 June 22, 2025

Venue：2F / DaGuan Conference Room B

Keliang Zhou

Dean of the School of Automation
Wuhan University of Technology, China

Qingqing He

Wuhan University of Technology, China

Abstract

As an enabling technology, power electronics is entering into all kind of energy processing systems and becomes fundamental to facilitate power conversions. A key issue for power electronic converters is the ability to tackle periodic signals, such as sinusoidal voltage/current regulation, power harmonics mitigation, synchronous frame transformation, grid synchronization, torque ripple suppression, wide-frequency oscillation suppression, and so on, for distributed generation and microgrid applications in such a way to precisely and flexibly convert and regulate electrical power.

A model is a precise representation of a system’ s dynamics, which allows us to reason about a system and make predictions about how a system will behave. For a control system, a system model contains at least two essential parts - the plant model inside the feedback control loop and the reference/disturbance model outside the feedback control loop. The plant model based control, e.g. internal model control, deadbeat control, model predictive control, etc. is normally responsible for adjusting the transient response and robust stability; according to the internal model principle (IMP), the periodic reference/disturbance model based control, e.g. Integral control, resonant control, repetitive control, etc., can ensure zero-error compensation of periodic signals, e.g. dc signals, sinusoidal signals and cyclic signals. A composite control, such as the most popular PID control, might take advantages of all composited controllers to achieve complementary good performance – fast, accurate, and robust regulation. However, in absence of knowledge of the plant model, a PID controller does not guarantee optimal control performance and system stability in the zero-error compensation of dc signals. Moreover, it is time- consuming to tune the PID controller via trail and error. Therefore, a complete system model based (SMB) optimal composite control strategy, which aims to takes full advantage of useful knowledge of the system mode to optimize control performance and robust stability, is proposed for power converters to achieve accurate, fast and robust regulation of reference output voltage/current and perfect rejection of disturbances.

This seminar is to lay a foundation of the system model based optimal composite control theory with basic theory, derivation of applied equations, knowhow on the control synthesis, and some most recent progress, which is found to provide power electronic converters with a superior control solution to the compensation of periodic signals with high accuracy, fast dynamic response, good robustness, and cost-effective implementation. This tutorial also contributes to this discipline combined with demonstrative application examples of the of SMB controller for power converters, which can be fruitful in future controller designs, and several cutting-edge application scenarios – e.g. wide-frequency oscillation suppression, ultra-low harmonic PV inverter, and etc. As an emerging topic, the SMB control has the great potential to be one of the best control solutions for power converters but not limited to, and to be a very popular standard industrial controller like the PID control.

Tutorials

Tutorial 05 Resonances with Grid-Forming Converters: Causes, Damping and DC-link Dynamics

Time：14:00-17:00 June 22, 2025

Venue：1F / YanLan Ballroom A

Xiongfei Wang

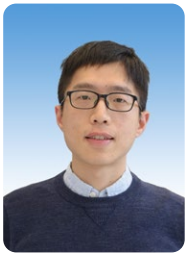
KTH Royal Institute of Technology, Sweden

Pedro Rodriguez

Luxembourg Institute of Science and Technology, Luxembourg

Fangzhou Zhao

Aalborg University, Denmark



Heng Wu

Aalborg University, Denmark

Abstract

The large-scale integration of converter-based resources, dc transmission systems, and loads bring new challenges to power system stability. Grid-forming (GFM) converters recently emerge as an enabling solution for addressing the stability challenges. However, the control dynamics of GFM converters, especially those related to power synchronization and dc-link voltage regulation, can still result in low-frequency resonances. Understanding the causes of these issues and developing effective damping controls are essential to fully realizing the potential of GFM technology in future power systems.

This tutorial provides a comprehensive exploration of principles, challenges, and damping control strategies for the resonances with GFM converters. It begins with the fundamentals of GFM principles, control methods, and the latest grid-forming capability requirements. Next, it offers a detailed analysis of the small-signal dynamics of GFM converters, providing clear physical insights into the causes of resonances under constant dc-link voltage conditions. Damping solutions, such as virtual impedance control, are also discussed, along with their impact on the reactive current response. Finally, the tutorial addresses the complexities of GFM converters with regulated dc-link voltage, covering small-signal modeling, controller design, and the analysis of torsional oscillations in GFM wind turbines. By combining theoretical insights with practical examples, this tutorial aims to equip participants with the knowledge and tools needed to design and optimize GFM converters for improved stability and performance in modern power systems.

Tutorials

Tutorial 06 On Medium-Voltage SiC devices—Reliability, Application and Impact on Grid

Time：14:00-17:00 June 22, 2025

Venue：1F / YanLan Ballroom B

Hao Feng

Chongqing University, State Key Laboratory of Power Transmission Equipment Technology, China

Chengmin Li

Eindhoven University of Technology, Netherlands

Yi Zhang

The Hong Kong Polytechnic University, Hong Kong/China

Abstract

Today, one of the most distinct feature towards carbon neutrality is the rapid power electronics penetration in the generation, transmission and distribution of modern grid. Driven by the surging capacity on renewable energy, energy storage and hydrogen production, medium voltage (MV) power electronics are playing growing roles in the power conversion, interconnection and protection. On the other hand, booming electricity demand from high-energy-consuming load such as datacenters arouse for a highly efficient and flexible interface to the MV grid. Meanwhile, amid the electrification of industrial and transportation sector, growing applications such as extreme fast charging of electric vehicles (EVs) and more-electrical aircraft raises the demand for more compact and efficient energy hub.

Above all calls for an urgent development on medium voltage power electronics, which have already grown exponentially for the last decade from a very low level, and now at the critical point of eruption.

Driven by the burgeoning demand, the MV Silicon Carbide (SiC) devices draw extensive attention and are widely deemed next generation’ s foundation for the MV power electronics.

On that basis, this tutorial will elaborate on the reliability, application of MV SiC devices and their impact on modern grid. The discussion begins with the context how MV SiC devices manage the transition to a more-power-electronics grid. Special attention is given to the devices rated above 10 kV to highlight the foreseeable scenarios and advantages, followed by the latest study on the reliability and evaluation method of MV SiC devices. Next, robust yet smart gate drivers are presented on fulfilling low-loss switching, EMI immunity and protection upon ultrahigh switching speed. Further, to fully unleash the potential of MV SiC devices, passive components including medium-frequency transformers, high-capacitance film capacitors and even insulation coordination systems are concluded as the major contributors, and their design rules are highlighted. Finally, examples such as Solid-State Transformer (SST), dc transformer and grid-tied converters are given to demonstrate how proper utilization of the MV SiC can help achieve a superior resilience and affordability of power grid, beyond efficiency and power density.

Tutorials

Tutorial 07 High Efficiency High Current Ultrafast XPU Power Supply for Next Generation Data Centers

Time：14:00-17:00 June 22, 2025

Venue：1F / DaGuan Conference Room A

Haoyu Wang

Shanghai Tech University, China

Hongfei Wu

Nanjing University of Aeronautics and Astronautics, China

Yueshi Guan

Harbin Institute of Technology, China

Abstract

Part I of the tutorial delves into heterogeneous integration methods and implementation techniques for high-frequency transformers, specifically designed to meet ultra-low voltage and ultra-high current XPU power supply requirements. The stringent demands for efficiency and power density in these supplies pose significant challenges in designing high-ratio, low-voltage, high-current transformers. Although magnetic integration technology can enhance transformer performance, it does not fully address XPU power supply needs. This section comprehensively examines the circuit structures of high-ratio high-frequency transformers using hybrid circuit integration, winding integration methods that employ cancellation techniques for high currents, and the principles and implementation strategies for integrating magnetic cores, windings, and switching networks. An example demonstrating the practical application of these methods will be presented, featuring a high-frequency transformer with a 0.8V/450A output and a power density of 1A/mm^2.

Part II shifts focus to resonant switched capacitor circuits tailored for high power density XPU power supplies. Given their superior energy density compared to magnetic components, capacitors have become a preferred choice for such applications. However, issues like charging and switching losses hinder efficiency improvements. This part explores how adding an inductor to form either hybrid or resonant switched capacitor circuits can overcome these limitations. It introduces the fundamental principles of resonant switched capacitor circuits and analyzes a two-stage cascaded method. Additionally, it outlines a voltage gain adjustment technique to enable closed-loop control in resonant switched capacitor circuits.

Part III offers an in-depth technical overview of trans-inductor voltage regulator (TLVR) converters used in data center point-of-load applications. A multi-phase series capacitor TLVR is introduced, utilizing constant on-time control for data center applications. This structure effectively halves switch voltage stress by splitting the input voltage among Buck cells, doubling both the step-down ratio and duty cycle. With indirectly coupled output inductors and low equivalent transient inductance, this design achieves ultra-fast dynamic responses. A prototype delivering 24V to 1.2V at 120A demonstrates peak efficiency of 91.1% and exceptional dynamic performance under extreme conditions. Comprehensive small-signal modeling using the describing function method accurately predicts its behavior, validated through SIMPLIS simulations and experiments, offering valuable insights for optimal controller design across various scenarios.

Tutorials

Tutorial 08 Converter-Driven Stability Issues and Solutions in Power Electronics Defined Power Systems

Time：14:00-17:00 June 22, 2025

Venue：1F / DaGuan Conference Room B

Georgios Konstantinou

UNSW Sydney, Australia

Ye Zhu

UNSW Sydney, Australia

Shan Jiang

UNSW Sydney, Australia

Abstract

The increasing penetration of inverted based resources (IBRs) and the retirement of synchronous generators (SGs) are leading to rapid transformations in global power systems. As power electronics converters are widely applied across power generation, transmission, and distribution, power systems face unprecedented stability challenges. This tutorial aims at introducing the power electronics converter driven stability issues through developing effective analysis methods to facilitate system stability demonstration and designing advanced control methods of power converters for stability enhancement. Both small-signal and large-signal stability of power electronics defined power systems will be covered.

This tutorial will firstly cover the impedance based small-signal stability analysis methodologies for power electronics defined power systems, including system modelling, stability assessment and stability-oriented control design. Different approaches to stability analysis such as Nyquist plot, Bode plot, will be explored. The concept of settling angle and the settling angle based stability criterion will be introduced to facilitate stability analysis of wide-area multi-converter systems, providing insights about instability mode identification and participation factor analysis for both single-bus and multi-bus systems. A case study based on the real-world Australian West Murray Zone oscillation events will be provided as an example of the stability analysis in a power electronics defined power system. Grid-forming (GFM) converters are promising solutions to enhance system stiffness during the transition towards weak grid, while the limited overcurrent capability and power capacity of GFM converters introduce the large-signal synchronisation stability challenges. The current limiting schemes will be introduced and compared in terms of their impacts on system synchronisation stability. Novel synchronisation control structures will be introduced to extend the functionalities of the conventional power-synchronisation loop in GFM converters, realising more responsible GFM design by coordinating physical limitations with grid support functionalities during contingencies. The stability analysis methodologies and stability-oriented control design are critical for ensuring the safe, reliable and stable operation of power-electronics defined power systems and further increasing the hosting capacity of IBRs towards the net zero targets.

Industry Sessions

I01

Chair(s):

Time：13:30-15:30 June 23, 2025

Venue：1F / YanLan Ballroom B

13:30-13:50	Grid-Forming VSC HVDC Transmissions Enable More Stable Future Power Systems	**Changjiang Zhan** NR Electric Co., Ltd.
13:50-14:10	Applications of the Modeling Software SimuNPS in New Power Systems	**Shi Linlong** Shanghai Keliang Information Technology Co., Ltd.
14:10-14:30	Key Technologies and Testing Challenges of New Energy Storage	**Peter** ITECH ELECTRONIC Co., Ltd.
14:30-14:50	CRRC Semiconductor Solutions for Renewable Power Generation Applications	**Hong Zeng** Zhuzhou CRRC Times Semiconductor Co.,Ltd
14:50-15:10	PV/BESS Power Converters and Grid Integration Control	**Dr. Yuanze Zhang** SUNGROW POWER SUPPLY Co., Ltd.
15:10-15:30	Cutting-edge Power Semiconductor Devices and Solutions for Distributed Generation Systems	**Dr.Masayoshi Tarutani** Mitsubishi Electric Corporation Power Device Works

Industry Sessions

I02

Chair(s):

Time：13:30-15:30 June 24, 2025

Venue：1F / YanLan Ballroom B

13:30-13:50	Empowering the Green & Low-Carbon Economy: Testing Solutions for Renewable Energy Systems	**Roy Liu Long** Nanjing Daoce Electronics Co., Ltd.
13:50-14:10	Power Electronics Equipment Testing Application	**Jordan.lee** Chroma Electronics (shenzhen) Co.,Ltd.
14:10-14:30	Single-Phase Single-Stage Isolated Resonant DC/AC Converter	**Yao Yousu** SolaX Power Network Technology (Zhejiang) Co., Ltd.
14:30-14:50	Development and Applicationof New Capacitors for the Power Electronics Industry	**Zhang Hongbing** Nantong Jianghai capacitor Co., Ltd
14:50-15:10	Model-Based Design for Power Electronics and Motor Drive Research and Innovation Platform	**Weigang Gu** Nanjing Rtunit Information Technology Co., Ltd.
15:10-15:30	500 kHz and Beyond: Cutting-Edge HIL Testing Solutions for Power Electronics	**Samar Aidrus** dSPACE GmbH

Technical Sessions

T01 Distributed Generation

Chair(s): Samir Kouro, Universidad Tecnica Federico Santa Maria, Chile
Keliang Zhou, Wuhan University of Technology, China

Time : 13:30-15:30 June 23, 2025

Venue : 2F / DaGuan Conference Room A

13:30-13:50	#123	**Improved Droop Control Strategy Based on Reactive Power Sharing Error Rate** **Fangsong Yan** (Xiamen University of Technology); **Damin Zhang** (Xiamen University of Technology); **Zezhong Wu** (Xiamen University of Technology); **Qinghui Du** (Xiamen University of Technology)
13:50-14:10	#149	**An Integrated Multifunctional Soft Open Point with Switch Multiplexing for Low Voltage Distribution Networks** **Mengjie Qin** (Xi'an Jiaotong University); **Mowei Lu** (University of Cambridge); **Wenjie Chen** (Xi'an Jiaotong University); **Xu Yang** (Xi'an Jiaotong University); **Stephan Goetz** (University of Cambridge)
14:10-14:30	#153	**Current-Sharing Control of Modular Parallel Inverter System Based on Current-Sharing and Synchronization Buses** **Hao Zhang** (Southeast University); **Jiangfeng Wang** (Southeast University); **Jingtian Shi** (Southeast University); **Huawu Liu** (JARI Electronics Company); **Tingying Wang** (JARI Electronics Company); **Wu Chen** (Southeast University)
14:30-14:50	#217	**A Dual-Frequency-Droop Based Nonactive Power Sharing Control Method for AC Microgrids** **Binrong Zhang** (Fuzhou University); **Baojin Liu** (Fuzhou University); **Feng Zheng** (Fuzhou University); **Bing Yu** (Fuzhou University); **Qingfeng Yu** (Fuzhou University)
14:50-15:10	#395	**Analysis of asynchronous excitation synchronous generator for distributed generation** **Linfan Zhan** (Nanjing University of Aeronautics and Astronautics); **Xiaoli Meng** (Nanjing University of Aeronautics and Astronautics); **Xingyue Li** (Nanjing University of Aeronautics and Astronautics); **Jie Zhong** (Nanjing University of Aeronautics and Astronautics)
15:10-15:30	#474	**An Accurate Unbalanced Power Sharing Control Method for Islanded Three-Phase Four-Wire Microgrids** **Wenchen Wang** (Xi'an Jiaotong University); **Jingwei Lu** (Xi'an Jiaotong University); **Zeng Liu** (Xi'an Jiaotong University); **Xiaochen Wu** (Xi'an Jiaotong University); **Jinjun Liu** (Xi'an Jiaotong University)

Technical Sessions

T02 Grid-Forming Converters

Chair(s): Xiongfei Wang, KTH Royal Institute of Technology, Sweden
Teng Liu, Electric Power Research Institute of China Southern Power Grid, China

Time : 13:30-15:30 June 23, 2025

Venue : 2F / DaGuan Conference Room B

13:30-13:50	#56	**Voltage Support Strength Assessment of Hybrid Power Systems Integrated with GFL and GFM converters** **Hongyang Qing** (Tsinghua University); **Hua Geng** (Tsinghua University); **Xin Zou** (State Grid Economic and Technological Research Institute Co., Ltd.)
13:50-14:10	#158	**A Siting Method of Grid-forming Energy Storage Plants Based on Small-signal Stability of Power System** **Lilai Bai** (Tsinghua university); **Chi Li** (Tsinghua university); **Zedong Zheng** (Tsinghua university)
14:10-14:30	#325	**A Wide-Bandwidth Grid Impedance Emulation for Compliance Testing of Grid-Connected Converters** **Zhihong Bai** (Zhejiang University); **Yebin Deng** (Zhejiang University)
14:30-14:50	#376	**Grid-Forming Control Design for VSG Energy Storage Converters Based on Time-Domain Dynamic Indicators** **JiaFan Chen** (Wuhan Maritime Communication Research Institute); **Yu Mei** (Nanjing University of Aeronautics and Astronautics); **Xin Chen** (Nanjing University of Aeronautics and Astronautics)
14:50-15:10	#528	**A Reconfigurable Modular Topology for Grid-Forming PV-ESS to Improve Overcurrent Capacity and Flexibility** **Jianyue Di** (Xi'an Jiaotong University); **Jia Liu** (Xi'an Jiaotong University); **Huaiyuan Ma** (Xi'an Jiaotong University); **Jinjun Liu** (Xi'an Jiaotong University); **Xing Zhang** (Hefei University of Technology)
15:10-15:30	#570	**Frequency Stability Enhancement of the Grid-following and Grid-forming Control with Emulated Inertia and Damping** **Fan Yang** (Delft University of Technology); **Haoyuan Yu** (Delft University of Technology); **Lu Wang** (Delft University of Technology); **Pavol Bauer** (Delft University of Technology); **Zian Qin** (Delft University of Technology)

Technical Sessions

T03 High-Power Converters

Chair(s): Ryan Yunwei Li, University of Alberta, Canada
Binbin Li, Harbin Institute of Technology, China

Time : 15:50-17:50 June 23, 2025

Venue : 2F / DaGuan Conference Room A

15:50-16:10	#79	**Hierarchical Capacitor Voltage Balancing Control Strategy for MMC Rectifier** **Yuanbo Yang** (Harbin Institute of Technology); **Dongxin Guo** (Harbin Institute of Technology); **Panbao Wang** (Harbin Institute of Technology); **Dianguo Xu** (Harbin Institute of Technology)
16:10-16:30	#170	**A Novel Cascaded Multilevel Inverter and Modular Multilevel DC Transformer-Based Solid-State Transformer for Distribution Networks** **HAFTAMU LEMLEM NIREA** (Shanghai Jiao Tong University); Jianwen Zhang (Shanghai Jiao Tong University); **Jianqiao Zhou** (Shanghai Jiao Tong University); **Gang Shi** (Shanghai Jiao Tong University); **Junjie Luo** (Shanghai Jiao Tong University); **Guodong Chen** (Shanghai Electric Group Transmission and Distribution Equipment Co., Ltd.)
16:30-16:50	#207	**A Modular Medium-Frequency Transformer-Based Converter for Current-Source Wind Energy Conversion System** **Ling Xing** (Queen's University); **Qiang Wei** (Lakehead University);**Yan-Fei Liu** (Queen's University)
16:50-17:10	#258	**An Optimization Method to Reducing the Internal Circulating Current for eMACP-MMC** **Junxian Chen** (Shanghai Jiao Tong University); **Jianqiao Zhou** (Shanghai Jiao Tong University); **Jianwen Zhang** (Shanghai Jiao Tong University); **Gang Shi** (Shanghai Jiao Tong University); **Xinming Fan** (Foshan Power Supply Bureau Guangdong Power Grid Company)
17:10-17:30	#410	**Demonstration of Comparative Evaluation Platform of 690 V – 4160 V Power Converters** **Gao Liu** (Aalborg University); **Zhixing Yan** (Aalborg University); **Morten Rahr Nielsen** (Aalborg University); **Hongbo Zhao** (Aalborg University); **Stig Munk-Nielsen** (Aalborg University); **Michael Møller Bech** (Aalborg University)
17:30-17:50	#502	**A Power Balancing Method for Cascaded Inverter Based on Carrier Vertical Adjustment** **Yang Ma** (Nanjing University of Aeronautics and Astronautics); **Zhong Chen** (Nanjing University of Aeronautics and Astronautics); **Jiakai Gan** (Nanjing University of Aeronautics and Astronautics); **Yunxi Chen** (Nanjing University of Aeronautics and Astronautics); **Lexuan Huang** (Nanjing University of Aeronautics and Astronautics)

Technical Sessions

T04 DC-AC Converters

Chair(s): Huai Wang, Aalberg University, Denmark
Qingsong Wang, Southeast University, China

Time : 15:50-17:50 June 23, 2025

Venue : 2F / DaGuan Conference Room B

15:50-16:10	#169	**Performance Comparison of PLL Techniques for Grid-Connected Inverters** **Abdulmajeed Alanazi** (university of manchester); **Ognjen Marjanovic** (university of manchester)
16:10-16:30	#194	**An Analytical Approach for Fractional-Order Modeling and Analysis of Z Source Converter** **Haochi He** (Nanjing University of Aeronautics and Astronautics); **Xiaoquan Zhu** (Nanjing University of Aeronautics and Astronautics); **Chentao Ma** (Nanjing University of Aeronautics and Astronautics)
16:30-16:50	#208	**Modulation Scheme of An Improved 5-Level Current Source Inverter** **Ling Xing** (Queen's University); **Qiang Wei** (Lakehead University); **Yan-Fei Liu** (Queen's University)
16:50-17:10	#306	**A Novel 3D-SVPWM Modulation Strategy for Zero-Sequence Circulating Current Suppression in Three-Phase Four-Leg Parallel-Inverter Systems** **Tianyi Wang** (Fuzhou University); **Baojin Liu** (Fuzhou University); **Feng Zheng** (Fuzhou University); **Zhaofeng Song** (Fuzhou University); **Zihao Qiu** (Fuzhou University); **Jiasheng He** (Fuzhou University)
17:10-17:30	#483	**Sensitivity analysis of noise source impedance measurements** **Rongxuan Zhang** (Nanjing University of Aeronautics and Astronautics); **Ziliang Zhang** (Nanjing University of Aeronautics and Astronautics); **Jun Zhan** (Nanjing University of Aeronautics and Astronautics); **Chunying Gong** (Nanjing University of Aeronautics and Astronautics)
17:30-17:50	#500	**A Current-Sharing Strategy for Single-Phase Inverter Parallel System Based on Multi-Loop Cooperative Control** **Zhong Chen** (Nanjing University of Aeronautics and Astronautics); **Kunkun Liu** (Nanjing University of Aeronautics and Astronautics); **Jie Chen** (Nanjing University of Aeronautics and Astronautics); **Jiakai Gan** (Nanjing University of Aeronautics and Astronautics); **Yunxi Chen** (Nanjing University of Aeronautics and Astronautics)

Technical Sessions

T05 Modeling and Control

Chair(s): Zian Qin, Delft University of Technology, Netherlands
Wu Chen, Southeast University, China

Time : 15:50-17:50 June 23, 2025

Venue : 2F / DaGuan Conference Room C

15:50-16:10	#113	**Harmonic Correction Method Based on Passive Reference Model of Full Frequency Band** **Zezhong Wu** (Xiamen University of Technology); **Damin Zhang** (Xiamen University of Technology); **Qinghui Du** (Xiamen University of Technology); **Fangsong Yan** (Xiamen University of Technology)
16:10-16:30	#147	**Peak Current Control of Dual Active Full-Bridge Based On Extended Phase Shift Control** **Jiahang Dong** (Wuhan University); **Shangzhi Pan** (Wuhan University); **Yu Chen** (Wuhan University)
16:30-16:50	#159	**High Efficiency Dual-active-bridge Converter with Improved Minimum Backflow Power Modulation Strategy** **Yutong Wang** (Harbin Institute of Technology); **Dongxin Guo** (Harbin Institute of Technology); **Panbao Wang** (Harbin Institute of Technology); **Dianguo Xu** (Harbin Institute of Technology)
16:50-17:10	#199	**Dual Sequence Discrete-Time Voltage Controller for LC-Filtered Voltage Source Inverter** **Kyoung-Hwan Sul** (Gachon University); **Hyeon-Sik Kim** (Gachon University)
17:10-17:30	#302	**A Generalized Discontinuous PWM for Three-Level NPC Inverter Over Full Power Factor Angle** **Xing Fang** (Shanghai Jiao Tong University); **Junzhong Xu** (Shanghai Jiao Tong University); **Lingchao Kong** (Shanghai Jiao Tong University); **Weidong Qie** (Shanghai Jiao Tong University); **Yong Wang** (Shanghai Jiao Tong University)
17:30-17:50	#465	**Geometric Duty Cycle Trajectory-Based Smooth Mode Transition Strategy in Four-Switch Buck-Boost Converters** **Zhengyang Zhou** (Nanjing University of Aeronautics and Astronautics); **Ke Jin** (Nanjing University of Aeronautics and Astronautics); **Weiyang Zhou** (Nanjing University of Aeronautics and Astronautics); **Jincheng Li** (Nanjing University of Aeronautics and Astronautics); **Wei Su** (Laboratory of Science and Technology on Reliability Physics and Application of Electronic Component); **Pengfei Yu** (Laboratory of Science and Technology on Reliability Physics and Application of Electronic Component)

Technical Sessions

T06 Power Quality

Chair(s): Dushan Boroyevich, Virginia Tech, USA
Xin Chen,Nanjing University of Aeronautics and Astronautics, China

Time : 13:30-15:30 June 24,2025

Venue : 2F / DaGuan Conference Room A

13:30-13:50	#205	**Transient Behavior of Grid-Forming Converters During Phase Jumps** **Shan Jiang** (University of New South Wales); **Ye Zhu** (University of New South Wales); **Georgios Konstantinou** (University of New South Wales)
13:50-14:10	#229	**Sensorless Active EMI Filter with Reduced Sensing Voltage and Injection Current Stress for Harmonic Mitigation in Power Electronics** **Wenyu Diao** (Harbin Institute of Technology); **Panbao Wang** (Harbin Institute of Technology); **Shiqi Jiang** (Harbin Institute of Technology); **Wei Wang** (Harbin Institute of Technology); **Dianguo Xu** (Harbin Institute of Technology)
14:10-14:30	#245	**High-Reliability ANPC Inverter with Fault Diagnosis and Fault-Tolerant Control for Renewable Energy Systems** **Fang Hao** (Zhejiang University); **Huan Yang** (Zhejiang University); **Wenxi Yao** (Zhejiang University)
14:30-14:50	#372	**Improving Grid Power Quality by Harmonic Compensation in Three-Phase PV Inverters with Active Filtering** **Chayakarn Saeseiw** (Naresuan University); **Tanakorn Kaewchum** (Naresuan University); **Piyadanai Pachanapan** (Naresuan University); **Christian Nöding** (Department of Power Electronics University of Kassel Kassel); **Jens Friebe** (Department of Power Electronics University of Kassel Kassel); **sakda somkun** (Naresuan University)
14:50-15:10	#448	**SVM implementation of the 4-switch non-inverting buck-boost Y-Inverter** **Hirotaka Araki** (Kyoto University of Advanced Science); **Alberto Castellazzi** (Kyoto University of Advanced Science)
15:10-15:30	#571	**A Three-phase Grid Emulator Based on a Harmonic Rotation Matrix for Power Quality Tests** **Daniel Memije** (Instituto Politecnico Nacional); **Jaime José Rodriguez** (Instituto Politecnico Nacional); **Oscar Carranza** (Instituto Politecnico Nacional); **Ruben Ortega** (Instituto Politecnico Nacional)

Technical Sessions

T07 Power Electronics Devices and Components

Chair(s): Drazen Dujic, Power Electronics Laboratory - EPFL, Serbia
Yunhui Mei, Tianjin Polytechnic University, China

Time : 13:30-15:30 June 24, 2025

Venue : 2F / DaGuan Conference Room B

13:30-13:50	#16	**Study of a Novel Annular Air-Core Reactor with High Power Density** **Tao Jiang** (Tsinghua University); **Yiqing Ma** (Tsinghua University); **Jialiang Hu** (Tsinghua University); **Zhe Yang** (Tsinghua University); **Xin Jin** (Tsinghua University); Bin Cui (Tsinghua University); **Biao Zhao** (Tsinghua University); **Xiangnan Du** (C-EPRI Electric Power Engineering Co., Ltd.)
13:50-14:10	#66	**Temperature-Dependent Characterization of Medium Voltage SiC MOSFETs for Solid State Transformer Applications** **Morten Rahr Nielsen** (Aalborg University); **Nianzun Qi** (Aalborg University); **Masaki Takahashi** (Aalborg University); **Gao Liu** (Aalborg University); **Zhixing Yan** (Aalborg University); **Hongbo Zhao** (Aalborg University); **Asger Bjørn Jørgensen** (Aalborg University); **Stig Munk-Nielsen** (Aalborg University)
14:10-14:30	#118	**Overload comparison of STATCOMs using 3.3kV Si-IGBT and SiC-MOSFET power modules** **Bochen Liu** (Hitachi Energy); **Muhammad Nawaz** (Hitachi Energy)
14:30-14:50	#124	**Transient Modeling of Series-Connected SiC MOSFETs Considering Inter-Device Coupling Effects** **Hao Yan** (Huazhong University of Science and Technology); **Han Peng** (Huazhong University of Science and Technology); **Junhao Lei** (Huazhong University of Science and Technology); **Jingbo Feng** (China Electric Power Research Institute); **Chao Li** (State Grid Fujian Electric Power Research Institute); **Weiming Chen** (State Grid Fujian Electric Power Research Institute)
14:50-15:10	#164	**Design and Implementation of GaN-HEMT based High-efficient 4MHz Full-Bridge Class-DE Power Amplifier** **Zhenfeng Wang** (Soochow University); **Liqun He** (Soochow University); **Jiawei Xu** (Soochow University); **Wenzhi Ge** (Soochow University); **Jiaqi Lu** (Soochow University); **Mingdi Fan** (Soochow University)
15:10-15:30	#485	**Oscillation Suppression Method for SSR with Reverse-Series Connected MOSFET** **Lixin Han** (HeBei University of Technology); **Yaokang Lai** (Beijing Ketong Electronic Relay General Factory Co., Ltd); **Chen Liu** (HeBei University of Technology); **Jianlong Kang** (HeBei University of Technology); **Xinyu Wang** (HeBei University of Technology); **Zhen Xin** (Hebei University of Technology)

Technical Sessions

T08 DC-DC Converters

Chair(s): Ying Li, University of Nottingham, UK
Xiaoquan Zhu, Nanjing University of Aeronautics and Astronautics, China

Time : 15:50-17:50 June 24, 2025

Venue : 2F / DaGuan Conference Room A

15:50-16:10	#157	**Evaluation and Control of a High Frequency Link Inverter with Minimum RMS Current** **Dongxin Guo** (Harbin Institute of Technology); **Panbao Wang** (Harbin Institute of Technology); **Yuanbo Yang** (Harbin Institute of Technology); **Yutong Wang** (Harbin Institute of Technology); **Wei Wang** (Harbin Institute of Technology); **Dianguo Xu** (Harbin Institute of Technology)
16:10-16:30	#268	**New Secondary Side Control Scheme for DAB converter with both side Isolated** **KIM DAUN** (KOREA NATIONAL UNIVERSITY OF TRANSPORTATION); **Chong - Eun Kim** (KOREA NATIONAL UNIVERSITY OF TRANSPORTATION)
16:30-16:50	#345	**Dual Coupled Inductors Based Ultra-High Voltage Gain DC-DC Converter with Continuous Input Current** **Na Wang** (Southwest Jiaotong University); **Qingxin Tian** (Southwest Jiaotong University); **Guohua Zhou** (Southwest Jiaotong University); **Yunuo He** (Southwest Jiaotong University)
16:50-17:10	#452	**Near-field radiation assessment via integrated time-frequency amplitude and entropy** **Jingxin Li** (Zhejiang University); **Ze Zhou** (Hebei University of Technology); **Dingyuan Bao** (Zhejiang University); **Jianghua Zhuo** (Zhejiang University); **Taohui Zhang** (Zhejiang University); **Zhen Xin** (Hebei University of Technology); **Haoze Luo** (Zhejiang University); **Wuhua Li** (Zhejiang University); **Xiangning He** (Zhejiang University)
17:10-17:30	#492	**The sampled data modeling for multiphase COT control** **Na Yan** (Institute of Microelectronics of the Chinese Academy of Sciences); **Wangqi Wang** (Institute of Microelectronics of the Chinese Academy of Sciences); **Xin Li** (Southeast University); **Che Song** (Institute of Microelectronics of the Chinese Academy of Sciences); **Xiangan You** (Institute of Microelectronics of the Chinese Academy of Sciences); **ZhiDan Fang** (Institute of Microelectronics of the Chinese Academy of Sciences)
17:30-17:50	#514	**Multi-source DC-link-less single-phase buck-boost inverter with discontinuous modulation** **Hirotaka Araki** (Kyoto University of Advanced Science); **Alberto Castellazzi** (Kyoto University of Advanced Science)

Technical Sessions

T09 Resonant Converters

Chair(s): Shuang Xu, University of New Brunswick , Canada
Fei Liu, Nanjing University of Aeronautics and Astronautics, China

Time : 15:50-17:50 June 24, 2025

Venue : 2F / DaGuan Conference Room B

15:50-16:10	#193	**Fractional-Order Modeling and Analysis of Boost ZVS Quasi-Resonant Converter** **Chentao Ma** (Nanjing University of Aeronautics and Astronautics); **Xiaoquan Zhu** (Nanjing University of Aeronautics and Astronautics); **Haochi He** (Nanjing University of Aeronautics and Astronautics)
16:10-16:30	#230	**A Control Strategy of the Three-Level DAB-SRC with Wide Voltage Range** **Pengyu Jia** (North China University of Technology); **Mingjun Liu** (North China University of Technology); **Hailin Zhang** (State Grid Yinchuan Electric Power Supply Company)
16:30-16:50	#276	**Reluctance-controlled Arbitrary Non-integer Turns Ratio Planar Transformer For DCX with High-current Applications** **Dongxing Yang** (Xi'an Jiaotong University); **Haodong Dai** (Zhejiang EV-Tech Co.,Ltd.); **Zhaoyi Wang** (Xi'an Jiaotong University); **Ziang Li** (Xi'an Jiaotong University); **Jinjun Liu** (Xi'an Jiaotong University); **Yuqi Wei** (Xi'an Jiaotong University)
16:50-17:10	#290	**Asymmetrical ISOP LLC Resonant Converter with Integrated Transformer for High Voltage Distributed DC Power system** **Yue Liu** (City University of Hong Kong); **Chaoqiang Jiang** (City University of Hong Kong); **Zhengke Zhang** (Nanjing University of Aeronautics and Astronautics); **Yibo Wang** (City University of Hong Kong); **Chen Chen** (City University of Hong Kong); **Xiaosheng Wang** (City University of Hong Kong); **Xin Jin** (Nanjing University of Aeronautics and Astronautics); **Hongfei Wu** (Nanjing University of Aeronautics and Astronautics)
17:10-17:30	#400	**Constant Power Control of Double-sided LCC Compensated Wireless Charging Systems Based on Sensitivity Analysis** **Zhenghao Wang** (Shanghai Jiao Tong University); **Huanjun Niu** (Shanghai Jiao Tong University); **Kai He** (Shanghai Jiao Tong University); **Xin Liu** (University of Electronic Science and Technology of China); **Fei Gao** (Shanghai Jiao Tong University)
17:30-17:50	#569	**A New Primary Side Resolution Scheme for Half-Bridge LLC Converter** **HwiMun Kim** (KOREA NATIONAL UNIVERSITY OF TRANSPORTATION); **JungHyun Yeo** (KOREA NATIONAL UNIVERSITY OF TRANSPORTATION); **Chong - Eun Kim** (KOREA NATIONAL UNIVERSITY OF TRANSPORTATION)

Technical Sessions

T10 Wireless Power Transfer System

Chair(s): Chi Tse, City University of Hong Kong, China
Qianhong Chen, Nanjing University of Aeronautics and Astronautics, China

Time : 15:50-17:50 June 24, 2025

Venue : 2F / DaGuan Conference Room C

15:50-16:10	#37	**A Fast Deskew Algorithm for V-I Alignment in Double Pulse Test of Wide-bandgap Devices** **Qi Hui** (Nanjing University of Aeronautics and Astronautics); **Xiaoyong Ren** (Nanjing University of Aeronautics and Astronautics); **Qianhong Chen** (Nanjing University of Aeronautics and Astronautics); **Bin Li** (Navitas Semiconductor Inc.)
16:10-16:30	#237	**A Full-Link Simultaneous Wireless Power and Information Transfer Architecture Based on Carrier Frequency Modulation** **Moqi Jia** (Nanjing University of Aeronautics and Astronautics); **Ke Jin** (Nanjing University of Aeronautics and Astronautics); **Chen Yang** (Nanjing University of Aeronautics and Astronautics); **Jiang Zhu** (Nanjing University of Aeronautics and Astronautics); **Jianying Ding** (Nanjing University of Aeronautics and Astronautics); **Weiyang Zhou** (Nanjing University of Aeronautics and Astronautics); **Shuo Zhang** (Nanjing University of Aeronautics and Astronautics); **Yuhang Fang** (Nanjing University of Aeronautics and Astronautics)
16:30-16:50	#266	**Design of Multilayer Structure Microstrip Patch Antenna** **Yuhang Fang** (Nanjing University of Aeronautics and Astronautics); **Ke Jin** (Nanjing University of Aeronautics and Astronautics); **Shuo Zhang** (Nanjing University of Aeronautics and Astronautics); **Weiyang Zhou** (Nanjing University of Aeronautics and Astronautics); **Jianying Ding** (Nanjing University of Aeronautics and Astronautics); **Qilin Gui** (Nanjing University of Aeronautics and Astronautics); **Moqi Jia** (Nanjing University of Aeronautics and Astronautics)
16:50-17:10	#386	**A Contactless Slipring System with Integrated Matrix Transformer for Low-voltage High-current Applications** **Yewei Xu** (Nanjing University of Aeronautics and Astronautics); **Qianhong Chen** (Nanjing University of Aeronautics and Astronautics); **Xinwei Wang** (Nanjing University of Aeronautics and Astronautics)
17:10-17:30	#397	**Research on Coil Switching Strategy Based on the Multi-transmitter WPT system** **Quanlei Zhang** (Nanjing University of Aeronautics and Astronautics); **Qianhong Chen** (Nanjing University of Aeronautics and Astronautics); **Feilong Li** (Nanjing University of Aeronautics and Astronautics); **Wenliang Cao** (Nanjing University of Aeronautics and Astronautics); **Xiaoyong Ren** (Nanjing University of Aeronautics and Astronautics)
17:30-17:50	#489	**Impedance Matching Network for 13.56 MHz Plasma RF System Based on the Combination of GaN-HEMTs and Relays** **Wenzhi Ge** (Soochow University); liqun he (Soochow University); **Xliang Fan** (Soochow University); **Jiawei Xu** (Soochow University); **Zhenfeng Wang** (Soochow University); **Xiaohui Li** (Suzhou City Univercity)

Special Sessions

S01 Converter-Based Distribution Systems

Chair(s): Jae-Jung Jung, Kyungpook National University, Republic of Korea
Yang Wu, Aalborg University, Denmark

Time : 13:30-15:30 June 23, 2025

Venue : 2F / DaGuan Conference Room C

13:30-13:50	#100	**Analysis and Mitigation of Oscillatory Instabilities Between GFM-VSG and DOL-IML in Islanded Microgrids** **Shufen Situ** (University of Alberta); **Rui Liu** (University of Alberta); **Zhiheng Lin** (University of Alberta); **Yunwei Li** (University of Alberta)
13:50-14:10	#222	**Adaptive Output Current Ripple Reduction Control of Interleaved LLC Converter Based on Time Domain Analysis** **Mingzhi Nie** (Shanghai Jiao Tong University); **Jie Chen** (Shanghai Jiao Tong University); **Lingfeng Jiang** (Shanghai Jiao Tong University); **Yong Wang** (Shanghai Jiao Tong University)
14:10-14:30	#251	**Comparison of Active Damping Methods for Grid-Forming Voltage-Source Converters** **Liang Zhao** (KTH Royal Institute of Technology); **Xiongfei Wang** (KTH Royal Institute of Technology); **Xiaonan Gao** (KTH Royal Institute of Technology)
14:30-14:50	#335	**Frequency-Domain Large-Signal Modeling and Stability Analysis for Dispatchable Virtual Oscillator Control** **Zheran Zeng** (Eindhoven University of Technology); **Han Mu** (Eindhoven University of Technology); **Dongsheng Yang** (Eindhoven University of Technology)
14:50-15:10	#342	**Modelling of DFIG-Based Wind Turbine for Transient Synchronization Stability Analysis** **Wenze Ding** (Tsinghua University); **Hua Geng** (Tsinghua University); **Changjun He** (Tsinghua University); **Jiaqi Li** (Tsinghua University)
15:10-15:30	#390	**Implementation and Control of a DC Microgrid with Power Sharing via CAN Communication** **Tanakorn Kaewchum** (Naresuan University); **Chayakarn Saeseiw** (Naresuan University); **Unchittha Prasatsap** (Naresuan University); **Suparak Srita** (Rajamangala University of Technology Lanna); **Christian Nöding** (Department of Power Electronics University of Kassel Kassel); **Jens Friebe** (Department of Power Electronics University of Kassel Kassel); **Sakda Somkun** (Naresuan University)

Special Sessions

S02 Artificial Intelligence Applications

Chair(s): Prof. Georgios Konstantinou, UNSW, Australia
Shan Jiang, UNSW, Australia

Time : 13:30-15:30 June 23, 2025

Venue : 1F / YanLan Ballroom A

13:30-13:50	#139	**Real-Time HIL Validation of Heterogeneous Graph Neural Network for IBR-Dominated Distribution Grids** **Aoxiang MA** (Luxembourg Institute of Science and Technology); **Jun CAO** (Luxembourg Institute of Science and Technology); **Pedro RODRIGUEZ** (Luxembourg Institute of Science and Technology)
13:50-14:10	#424	**Fault Prediction and Health Management of Electromechanical Systems:A Machine Learning Approach** **Hailing Sun** (AVIC The First Aircraft Design Institute); **Chaochao Du** (AVIC The First Aircraft Design Institute); **Hui Huang** (AVIC The First Aircraft Design Institute); **Ze Wu** (Chang' an University); **Xinrong Huang** (Chang' an University); **Wenjie Liu** (Northwestern Polytechnical University)
14:10-14:30	#453	**Enhancing Artificial Intelligence-Enabled Power System Stability Assessment through Digital Twin Testbeds** **Zhiwei Shen** (UNSW Sydney); Felipe Arraño-Vargas (UNSW Sydney); **Georgios Konstantinou** (University of New South Wales)
14:30-14:50	#493	**An Intelligent Control-Guided Fast Charging Strategy for Lithium-ion Batteries** **Muhammad Sohail** (Tianjin University); **Muhammad Saeed** (Shanghai Jiao Tong University); **Arash Khalatbarisoltani** (Chongqing University); **Hafiz Muhammad Jawaad** (National University of Sciences and Technology, Pakistan); **Leijiao Ge** (Tianjin University)
14:50-15:10	#536	**ANN-Based Resynchronization Control for Virtual Synchronous Generator** **Yu Zhang** (Shanghai Jiao Tong University); **Chen Zhang** (Shanghai Jiao Tong University); **Haoxiang Zong** (Shanghai Jiao Tong University); **Marta Molinas** (Norwegian University of Science and Technology); **Xu Cai** (Shanghai Jiao Tong University)
15:10-15:30	#566	**A Novel Topology for Online Condition Monitoring On-State Voltage of Power Devices** **Yuwen Huang** (Nanjing University of Aeronautics and Astronautics); **Xirui Zhu** (Aerospace System Engineering Shanghai); **Weiyang Zhou** (Nanjing University of Aeronautics and Astronautics); **Wei Su** (Laboratory of Science and Technology on Reliability Physics and Application of Electronic Component); **Pengfei Yu** (Laboratory of Science and Technology on Reliability Physics and Application of Electronic Component)

Special Sessions

S03 Grid-Forming Technology - I

Chair(s): Shenghui Cui,Seoul National University, Korea
Yongheng Yang, Zhejiang University, China

Time : 15:50-17:50 June 23, 2025

Venue : 1F / YanLan Ballroom A

15:50-16:10	#223	**Transient Current Behavior and Analytical Expression Derivation for GFM Converters under Grid Symmetric Faults** **Zou Xiao** (Zhejiang University); **Zhi Huang** (Zhejiang University); **Boxin Liu** (Zhejiang University); **Qiannan Qu** (Zhejiang University); **Xin Xiang** (Zhejiang University); **Wuhua Li** (Zhejiang University)
16:10-16:30	#224	**Impedance Modeling and Stability Analysis of VSG-Based Grid-Forming Photovoltaic Inverters** **Pengkai Zhang** (Shanghai University Of Electric Power); **Jing Lyu** (Shanghai Jiao Tong University); **Han Wang** (Shanghai Jiao Tong University); **Xu Cai** (Shanghai Jiao Tong University)
16:30-16:50	#236	**Impedance Modeling and Analysis of Grid-Forming DFIG-based Wind Turbine Systems** **Yunxiang Pan** (North China Electric Power University); **Jing Lyu** (Shanghai Jiao Tong University); **Xingyu Han** (Shanghai Jiao Tong University); **Chunyi Guo** (North China Electric Power University)
16:50-17:10	#333	**Analysis of Reverse Active Power for Grid-Forming Converters During Fault Ride-Through** **Liang Zhao** (KTH Royal Institute of Technology); **Xiongfei Wang** (KTH Royal Institute of Technology); **Xiaonan Gao** (KTH Royal Institute of Technology)
17:10-17:30	#457	**Transient Synchronization Stability Analysis of Hybrid Islanded Systems with GFM and GFL Converters** **Sheng Yang** (Shanghai Jiao Tong University); **Chao Wu** (Shanghai Jiao Tong University); **Yong Wang** (Shanghai Jiao Tong University); **Zhanqi Huang** (Shanghai Jiao Tong University)
17:30-17:50	#466	**Comparative Study on Current limiting Methods for Model Predictive Control Virtual Synchronous Generator under Grid Voltage Sag** **Hanxu Diao** (Nanjing University of Aeronautics and Astronautics); **Xingwei Mu** (Nanjing University of Aeronautics and Astronautics); **Jinming Xu** (Nanjing University of Aeronautics and Astronautics)

Special Sessions

S04 Renewable Energy Based DC Grids

Chair(s): Rik W. De Doncker, RWTH Aachen University, Germany
Jingxin Hu, Nanjing University of Aeronautics and Astronautics, China

Time : 15:50-17:50 June 23, 2025

Venue : 1F / YanLan Ballroom B

15:50-16:10	#262	**A Novel Cluster Balance Strategy for Delta-type Serial Shunt Soft-normally Open Points' DC** **Wei Jiang** (Guangdong Power Grid Corporation Foshan Power Supply Bureau); **Xinming Fan** (Guangdong Power Grid Corporation Foshan Power Supply Bureau); **Jianwen Zhang** (Shanghai Jiao Tong University); **Jianqiao Zhou** (Shanghai Jiao Tong University); **Gang Shi** (Shanghai Jiao Tong University); **Xilian Huang** (Shanghai Jiao Tong University)
16:10-16:30	#341	**Full-Power-Range Instantaneous Flux and Current Control of Three-Phase DAB Converters with Different Winding Configurations** **Haojie Xie** (Nanjing University of Aeronautics and Astronautics); **Mingwei Lu** (Nanjing University of Aeronautics and Astronautics); **Zhenyi Li** (Nanjing University of Aeronautics and Astronautics); **Jingxin Hu** (Nanjing University of Aeronautics and Astronautics)
16:30-16:50	#343	**Mission Profile Emulation for PV Characteristic of Converters with MPPT Algorithm** **Wenjie zhu** (Shanghai Jiao Tong University); **Ke Ma** (Shanghai Jiao Tong University); **Shihao xia** (Shanghai Jiao Tong University)
16:50-17:10	#363	**Evaluation of IGBT drive resistance impact on near-field radiation based on time-frequency feature extraction** **Xiaohui Xu** (Wuhan Institute of Marine Electric Propulsion); **Jingxin Li** (Zhejiang University); **Qibiao Lu** (Zhejiang University); **Xiaoyu Zhao** (Wuhan Institute of Marine Electric Propulsion); **Xuerui Gong** (Wuhan Institute of Marine Electric Propulsion); **Xiaokang Xu** (Wuhan Institute of Marine Electric Propulsion); **Haoze Luo** (Zhejiang University); **Wuhua Li** (Zhejiang University); **Xiangning He** (Zhejiang University)
17:10-17:30	#475	**Research on Soft-start Control Method for Diode-Clamped resonant DC/DC Converter** **Zexiang Zhu** (CSG Electric Power Research Institute China Southern Power Grid); **Hefeng Zhai** (CSG Electric Power Research Institute China Southern Power Grid); **Runze Liu** (Harbin Institute of Technology); **Yingzong Jiao** (Harbin Institute of Technology); **Binbin Li** (Harbin Institute of Technology)
17:30-17:50	#583	**Simulation and Analysis of a Single-Bus DC Industrial Power Distribution System with Rotating Load Regenerative Energy Feedback** **Yeji Jiang** (Xi'an Jiaotong University); **Li Qi** (Xi 'an Jiaotong University); **Jinzhuo Bai** (Xi 'an Jiaotong University); **Xuemeng Zhang** (Xi 'an Jiaotong University); **Zhiguo Hao** (Xi 'an Jiaotong University); **Ting Wang** (Xi 'an Jiaotong University)

Special Sessions

S05 Transportation Electrification

Chair(s): Fei Deng, Nanyang Technological University, Singapore
Xiangke Li, Northwestern Polytechnical University, China

Time : 13:30-15:30 June 24, 2025

Venue : 2F / DaGuan Conference Room C

13:30-13:50	#70	**Decentralized Power Management in Fuel Cell Battery Power Systems** **Fei Deng** (Northwestern Polytechnical University); **Zhigang Yao** (Nanyang Technological University); **Xiangke Li** (Northwestern Polytechnical University); Wenli Yao (Northwestern Polytechnical University); Weilin Li (Northwestern Polytechnical University); Xiaobin Zhang (Northwestern Polytechnical University)
13:50-14:10	#104	**Hybrid PSLLC Converter With Integrated Magnetics for Space Power Supply** **Shaoliang An** (Xi'an University of Technology); **Shuanggang Li** (Shanghai Institute of Space Power-Sources); **hang wang** (Xi'an University of Technology); **CHANG TIANHAO** (Xi'an University of Technology); **Ang Shen** (Shanghai Institute of Space Power-Sources); **Yifan Xu** (Xi'an University of Technology)
14:10-14:30	#126	**Research on the Integration of Strip PV Along the Electrified Railways into AC Traction Substation** **Yaqing Fan** (Beijing Jiaotong University); **Yan Li** (Beijing Jiaotong University); **Fangyi Wei** (Beijing Jiaotong University); **Liqing Chen** (Beijing Jiaotong University)
14:30-14:50	#260	**Ripple suppression method for battery energy storage system based on separated capacitor** **Linlin Chu** (State Grid Shanghai Shinan Power Supply Company); **Ming Zong** (State Grid Shanghai Shinan Power Supply Company); **Hao Qiu** (Shanghai Jiao Tong University); **Jianqiao Zhou** (Shanghai Jiao Tong University); **Jianwen Zhang** (Shanghai Jiao Tong University); **Gang Shi** (Shanghai Jiao Tong University)
14:50-15:10	#504	**An Improved Feedforward Control Strategy in Droop-Controlled DC Microgrids for the More Electric Aircraft** **Tie Gong** (Shanghai Jiao Tong University); **Fei Gao** (Shanghai Jiao Tong University); **Wei Liu** (COMAC Program Center)
15:10-15:30	#567	**An Improved Model Predictive Pulse Pattern Control for Motor Drive at Low Carrier Ratios** **Zhihong Bai** (Zhejiang University); **Xuanbo Wang** (Zhejiang University); **Su Weifeng** (China Tianxin IIoT Corporation Limited)

Special Sessions

S06 Active Distribution Systems

Chair(s): Qiao Peng, Sichuan University, China
Xinrong Huang, Chang' an University, China

Time : 13:30-15:30 June 24, 2025

Venue : 1F / YanLan Ballroom A

13:30-13:50	#167	**Real-Time Simulation of Multi-Unit Power Conversion Systems for Enhanced Battery Energy Storage Development** **Seyed Milad Hoseinizadeh** (OPAL-RT Technologies); **Wei Li** (OPAL-RT Technologies); **Sebastien Cense** (OPAL-RT Technologies); **Hosein Chalangar** (Hitachi Energy)
13:50-14:10	#239	**Novel Space-Vector PWM Strategy of the Quasi-Z-Source Inverter for Current Ripple Reduction with Less Computation Burden** **Gerui Zhang** (Northwestern Polytechnical University); **Yiming Xu** (Northwestern Polytechnical University); **Xinrong Huang** (Chang'an University); **Wenjie Liu** (Northwestern Polytechnical University)
14:10-14:30	#240	**Enhanced Common-Mode Voltage Suppression in A Modified Three-phase Four-leg Quasi-Z-Source Inverter** **Jiayuan Zhang** (Northwestern Polytechnical University); **Yiming Xu** (Northwestern Polytechnical University); **Xinrong Huang** (Chang'an University); **Wenjie Liu** (Northwestern Polytechnical University)
14:30-14:50	#519	**Primary Frequency Regulation Strategy for Electric Vehicle Clusters Considering Traveling Demands and Market Incentives** **Longyi Liang** (Sichuan University); **Qiao Peng** (Sichuan University); **Jun Yang** (Sichuan University); **Tingyun Gu** (Guizhou Power Grid Co., Ltd. Electric Power Research Institute)
14:50-15:10	#556	**Comprehensive Comparison of Full- and Partial- Power Processing Converters for Aviation Energy Storage System** **Shuaipeng Ma** (Northwestern Polytechnical University); **Liang Xu** (Nanjing Engineering Institute of Aircraft Systems, AVIC); **Wenli Yao** (Northwestern Polytechnical University); **Ming Huang** (Northwestern Polytechnical University); **Xiaobin Zhang** (Northwestern Polytechnical University); **Wenjie Liu** (Northwestern Polytechnical University)
15:10-15:30	#568	**Stability of PV-Hydrogen Energy Hubs with Grid-Forming Energy Storage** **Fan Yang** (Delft University of Technology); **Haoyuan Yu** (Delft University of Technology); **Junjie Xiao** (Delft University of Technology); **Pavol Bauer** (Delft University of Technology); **Zian Qin** (Delft University of Technology); **Saran Ganesh** (Shell Global Solutions International B.V.); **Toshi Sharma** (Shell Global Solutions International B.V.); **Amulya Sahoo** (Shell Global Solutions International B.V.); **Martijn Lunshof** (Shell Global Solutions International B.V.); **Cor van Kruijsdijk** (Shell Global Solutions International B.V.)

Special Sessions

S07 Grid-Forming Technology - II

Chair(s): Heng Wu, Aalborg University, Denmark
Yuying He , Hohai University, China

Time : 15:50-17:50 June 24, 2025

Venue : 1F / YanLan Ballroom A

15:50-16:10	#71	**Comparison of Equivalent Circuit Models of Circular Current Limiter According to Anti-Windup Methods in Grid-Forming Converter** **Seongyeon Kim** (Kyungpook National University); **Ki-Hyun Kim** (Kyungpook National University); **Shenghui Cui** (Seoul National University); **Jae-Jung Jung** (Kyungpook National University)
16:10-16:30	#140	**Stability Analysis of Grid-Forming MMC in All-DC System Considering Harmonic Coupling** **Xuhui Zheng** (Harbin Institute of Technology); **Yingzong Jiao** (Harbin Institute of Technology); **Binbin Li** (Harbin Institute of Technology)
16:30-16:50	#334	**A Two-Dimensional Dead-Zone Virtual Oscillator Control for Single-Phase Inverters** **Zheran Zeng** (Eindhoven University of Technology); **Han Mu** (Eindhoven University of Technology); **Dongsheng Yang** (Eindhoven University of Technology)
16:50-17:10	#402	**Ultra-Fast Black-Start Method of the Grid-Forming Converter for Electronic Power Grids with Transformer Soft Magnetization** **Jiyu Lee** (Seoul National University); **Jonghun Yun** (Seoul National University); Jaekeun Lee (Seoul National University); **Heng Wu** (Aalborg University); **Jae-Jung Jung** (Kyungpook National University); **Shenghui Cui** (Seoul National University)
17:10-17:30	#430	**Frequency-Domain Large Signal Modeling and Non-Conservative Stability Analysis of Grid-Forming Converters: An Unified Approach Scalable For Large Scale Multi-Converter Systems** **Dongsheng Yang** (Eindhoven University of Technology)
17:30-17:50	#449	**Equivalent Virtual Inductance Method without Differential Operation for Current -Limiting Control of Grid-Forming Converters** **Jaekeun Lee** (Seoul National University); **Jae-Jung Jung** (Kyungpook National University); **Shenghui Cui** (Seoul National University)

Special Sessions

S08 Energy Storage Systems

Chair(s): Jiandong Duan, Harbin Institute of Technology, China
Shaogui Fan, Yantai Research Institute of Harbin, China

Time : 15:50-17:50 June 24, 2025

Venue : 1F / YanLan Ballroom B

15:50-16:10	#142	**Online Estimation for Equivalent Circuit Parameters of Lithium-ion Battery Based on Impedance Measurement** **Shaogui Fan** (Harbin Engineering University); Ding Wen (Harbin Engineering University); **Yueyue Fan** (Harbin Engineering University); **Yulong Mei** (Harbin Engineering University); **Zekun Wang** (Harbin Engineering University); **Mingming Li** (YantaiChungway New Energy Technology Co., ltd.); **Yuxi Liu** (YantaiChungway New Energy Technology Co., ltd.)
16:10-16:30	#143	**Thermal Runaway Prediction of Lithium-ion Battery Based on Impedance Online Measurement** **Shaogui Fan** (Harbin Engineering University); Ding Wen (Harbin Engineering University); **Yueyue Fan** (Harbin Engineering University); **Zelu Shao** (Harbin Engineering University); **Yulong Mei** (Harbin Engineering University); **Mingming Li** (YantaiChungway New Energy Technology Co., ltd.); **Yuxi Liu** (YantaiChungway New Energy Technology Co., ltd.)
16:30-16:50	#186	**Power Distribution of Energy Storage Systems for Smoothing Wind Power Fluctuations** **Haoran Pei** (Harbin Institute of Technology); **Jiandong Duan** (Harbin Institute of Technology)
16:50-17:10	#187	**State of Charge Estimation of Ultracapacitor Modules Based on Sage Husa Improved Adaptive Extended Kalman Filter Algorithm** **Hongzheng Wang** (Harbin Institute of Technology); **Ke Zhao** (Harbin Institute of Technology); **Jiandong Duan** (Harbin Institute of Technology)
17:10-17:30	#284	**VSG Control of Grid-Connected Three-Level Inverter** **Zongwei Yang** (Harbin Institute of Technology); **Jiandong Duan** (Harbin Institute of Technology)
17:30-17:50	#414	**A Self-Discharge Fault Diagnosis Method for Electric Vehicle Batteries** **Yuhong Fan** (ShanghaiTech University); **Song Feng** (China Automotive Engineering Research Institute Co., Ltd.); **Yifei Xu** (ShanghaiTech University); **Jiaqi Zhao** (ShanghaiTech University); **Caiying Xu** (ShanghaiTech University); **Wenjin Yang** (ShanghaiTech University); **Hengzhao Yang** (ShanghaiTech University)

Poster Sessions

Time：15:50-17:50 June 23, 2025

Venue：2F / DaGuan Conference Room Foyer

P01 Grid-Connected Converter

Chair(s)

Ying Li, University of Nottingham, Britain
Jinming Xu, Nanjing University of Aeronauticsand Astronautics, China

Paper ID	
29	320
68	404
69	419
102	444
109	447
122	463
137	468
178	525
180	529
220	535
250	541
252	547
254	549
281	557
309	

P02 Energy Storage Systems

Chair(s)

Xiaoyong Ren, Nanjing University of Aeronautics and Astronautics, China
Xiaoling Xiong, North China Electric Power University,China

Paper ID	
18	421
151	432
156	433
166	450
182	451
191	497
196	498
296	520
315	530
324	551
338	552
347	554
351	555
383	560
389	578
408	

Poster Sessions

Time：15:50-17:50 June 24, 2025

Venue：2F / DaGuan Conference Room Foyer

P03 Power Converters

Chair(s)

Yue Liu, City University of Hong Kong, China
Xin Li, Southeast University, China

Paper ID	
12	393
197	394
209	407
221	409
255	428
282	437
286	467
294	469
322	470
327	472
354	481
358	488
369	507
380	518
388	582

P04 Emerging Topics For Distributed Generation

Chair(s)

Jiangfeng Wang,Southeast University, China
Weiyang Zhou, Nanjing University of Aeronautics and Astronautics, Chin

Paper ID	
6	348
27	365
75	367
90	416
99	418
108	420
163	429
168	456
226	460
249	473
259	476
265	495
278	546
280	561
330	579
337	

P01: Grid-Connected Converter

#29
Control Strategy for Inverters Mimicking Frequency Characteristic of Diesel Generator Sets

Qinyuan Xie (Huazhong University of Science and Technology); Guorun Yang (National Key Laboratory of Electromagnetic Energy); **Jie Ding** (Southeast University); **Kewen Lin** (National Key Laboratory of Electromagnetic Energy)

#68
Soft-Switched Single-Stage Bidirectional High-Frequency Isolated DC-AC Converter

Jiahang Qin (NORTHEAST ELECTRIC POWER UNIVERSITY); **Yu Jiang** (NORTHEAST ELECTRIC POWER UNIVERSITY); **Chuang Liu** (NORTHEAST ELECTRIC POWER UNIVERSITY); **Rutian Wang** (NORTHEAST ELECTRIC POWER UNIVERSITY)

#69
Pulse Width Modulation Strategy for Eliminating Common-Mode Voltage in T-Type Three-Level Inverters Considering Dead Time

Luying Yuan (Wuhan University of Technology); **Qingqing He** (Wuhan University of Technology); **Yahong Chen** (Wuhan University of Technology); **keliang zhou** (Wuhan University of Technology);

#102
Stability Analysis of Single-Loop Voltage Magnitude Controlled Grid-Forming Converters Considering Voltage Loop Parameter Impact

yizhan wu (Shanghai University); Dingming Meng (Shanghai University); Xuankun Hu (Shanghai University); Fei Wang (Shanghai University); Hui Guo (Shanghai University); Chen Xu (Shanghai University)

#109
A System-level Framework for IGBT Open-circuit Fault Diagnosis in Grid-tied System

Yongjie Liu (Aalborg University); **Ariya Sangwongwanich** (Aalborg University); **Chen Liu** (Aalborg University); **Xing Wei** (Aalborg University); **Bo Yao** (Aalborg University); **Jiahong Liu** (Aalborg University); **Huai Wang** (Aalborg University)

#122
Synchronization Stability Enhancement Methods for Grid-Forming Converters with Current Limiters

Tianyi Xu (University of New South Wales); **Shan Jiang** (UNSW Sydney); **Georgios Konstantinou** (University of New South Wales)

#137
Sesorless Voltage Control of a Three-Phase Grid-Connected Inverter Using an Estimated Synchronous Reference Frame

Byeong-Gyu Kang (HYUNDAI KEFICO CORPORATION); **Ki-Young Choi** (HYUNDAI KEFICO CORPORATION); **Chan-In Kim** (HYUNDAI KEFICO CORPORATION); **Hack-Jun Kim** (HYUNDAI KEFICO CORPORATION); **Myeong-Hwan Kim** (HYUNDAI KEFICO CORPORATION); **Kyoung-Kook Min** (HYUNDAI KEFICO CORPORATION)

P01: Grid-Connected Converter

#178
Windup Analysis and Anti-Windup Control for Grid-Forming Voltage Source Converter

Minghao Li (Huazhong University of Science and Technology); **Xuehua Wang** (Huazhong University of Science and Technology); **Yijie Ren** (Huazhong University of Science and Technology); **Xinbo Ruan** (Huazhong University of Science and Technology)

#180
Transient Stability Analysis of the Grid Forming Inverters Based on Inverse Trajectory method

Yijie Ren (Huazhong University of Science and Technology); **Xuehua Wang** (Huazhong University of Science and Technology); **Minghao Li** (Huazhong University of Science and Technology); **Xinbo Ruan** (Huazhong University of Science and Technology)

#220
The Impact of Virtual Impedance on System Stability in Grid-Forming Converters with Cascaded Control Structure

Pengjiang Ge (State Grid Corporation Northwest Branch); **Yuan Zhi** (State Grid Corporation Northwest Branch); **Dan Dong** (State Grid Corporation Northwest Branch); **Kun Wang** (NR Electric Co. Ltd.); **Hao Luo** (NR Electric Co. Ltd.); **Jing Ge** (NR Electric Co. Ltd.)

#250
An Efficient Single-Phase Full Bridge Passive SiC-Based Soft-Switching Inverter With Energy Feedback Function

Youzheng Wang (Tiangong University); **Shengxiu Xu** (Tiangong University); **Shuyu Wang** (Harbin Institute of Technology); **Bowen Zhang** (Tiangong University); **Longnv Li** (Tiangong University); **Gaojia Zhu** (Tiangong University); **Zemin Bu** (Tiangong University); **Yunhui Mei** (Tiangong University)

#252
Transient Stability Analysis of DC-Link Voltage Synchronization Control Grid-forming Converter Considering the Impact of Current Limiter

Yi Song (Electric Power Research Institute of Guangxi Power Grid Co., Ltd.); **xiaoming wang** (Electric Power Research Institute of Guangxi Power Grid Co., Ltd.); **Yiyun Yang** (Electric Power Research Institute of Guangxi Power Grid Co., Ltd.); **Zhiyuan Sun** (Electric Power Research Institute of Guangxi Power Grid Co., Ltd.); **Jinzhao Li** (Electric Power Research Institute of Guangxi Power Grid Co., Ltd.)

#254
Carrier-Based Current-Mode Discontinuous Pulse-With Modulation for the Loss Reduction of VSI

Xiang Zheng (Hangzhou Dianzi University); **Yangwei Yu** (Zhejiang University); **Lijun Hang** (Hangzhou Dianzi University); **Bin Chen** (Suzhou Anchi Control System Co., Ltd.); **Yandong Chen** (Hunan University); **Sai Tang** (Hangzhou Dianzi University); **Yuanbin He** (Hangzhou Dianzi University); **Jun Wang** (Hunan University); **Yuchao Shi** (Hangzhou Power Supply Company of Zhejiang Power Co. Ltd. of State Grid Corporation of China)

#281
Study on Multi-Bus Power Feeding Conversion System for Data Centers

zhiqing lin (Hangzhou Dianzi University); **Yuanbin He** (Hangzhou Dianzi University); **Yilong Zhou** (Marine Design & Rese arch Institute of China); **Lijun Hang** (Hangzhou Dianzi University)

#309
Natural Transient-Behavior-Based Control Technique for dc-dc Converter System with High-Inertia Loads

Hongyu Chen (Tianjin University); Nie Hou (Tianjin University); **Jinwei He** (Tianjin University)

P01: Grid-Connected Converter

#320
Neural Network-Enhanced Control Strategy for Multiport Multilevel Inverters with a Parallel Structure in Distributed Photovoltaic Generation

Pengxin Jin (Wuhan University); **Shangzhi Pan** (Wuhan University); **Jiawang Tong** (Wuhan University); **Guoqing He** (China Electric Power Research Institute); **Jinwu Gong** (Wuhan University);

#404
Seamless Grid-Connection Technology for Emergency Power Supply Based on Dual-Winding Induction Generator and Energy Storage Hybrid System

Peng Xue (Nanjing University of Aeronautics and Astronautics); **Yajun Zhao** (Nanjing University of Aeronautics and Astronautics); **Feifei Bu** (Nanjing University of Aeronautics and Astronautics); **Feilong Jiang** (Nanjing University of Aeronautics and Astronautics); **Yikun Tian** (Nanjing University of Aeronautics and Astronautics)

#419
Modeling and Analysis of Grid-Tied VSC With Hybrid Synchronization Control

Qidi Zhong (State Grid Economic and Technological Research Institute CO., Ltd); **kai Zhang** (Hefei University of Technology); **Shiyang Chang** (State Grid Economic and Technological Research Institute CO., Ltd); **Shaowei Wang** (State Grid Economic and Technological Research Institute CO., Ltd); **Ziwei Feng** (Economic and Technological Research Institute of State Grid Xinjiang Electric Power Co.,Ltd); **Zhiqing Yang** (Hefei University of Technology)

#444
Analyzing Method for Transient Active Power Difference between Parallel Grid-Connected Grid-Forming Converters

Xiaoyu Liu (China Electric Power Research Institute); **Xiangjun Li** (China Electric Power Research Institute); **Ming Li** (Electric Power Research Institute of State Grid Xinjiang Electric Power Co., Ltd.); **YaXiaEr TuErHong** (Electric Power Research Institute of State Grid Xinjiang Electric Power Co., Ltd.); **Sijia Zong** (Electric Power Research Institute of State Grid Xinjiang Electric Power Co., Ltd.); **Tao Yan** (China Electric Power Research Institute)

#447
A Low Voltage Ride-Through Strategy for Grid-Forming Converters with Reactive Power Loop-Based Control

Yunping Zheng (Electric Power Research Institute of State Grid Xinjiang Electric Power Co., Ltd.); **Xiangjun Li** (China Electric Power Research Institute); **Xiaoyu Liu** (China Electric Power Research Institute); **Sijia Zong** (Electric Power Research Institute of State Grid Xinjiang Electric Power Co., Ltd.); **Ming Li** (Electric Power Research Institute of State Grid Xinjiang Electric Power Co., Ltd.); **Hanning Li** (China Electric Power Research Institute)

#463
A Novel Decentralized Control for Cascaded H-Bridge Inverters

Aiwen Wang (Sichuan University); **Ning Jiao** (Sichuan University); **Shunliang Wang** (Sichuan University); **Junpeng Ma** (Sichuan University); **Hao Tu** (Sichuan University); **Tianqi Liu** (Sichuan University)

#468
Simplified Stability Analysis and Enhancement Methods for Grid-Connected Inverter System in Sequence-Domain

Yichen Sun (Nanjing University of Aeronautics and Astronautics); **Xinbo Ruan** (Huazhong University of Science and Technology); **Yiran Yan** (Nanjing University of Aeronautics and Astronautics); **Jiang Zhan** (Nanjing University of Aeronautics and Astronautics); **youjie shi** (Electric Power Research Institute); **junjie feng** (Electric Power Research Institute)

P01: Grid-Connected Converter

#525

An Improved Grid-Forming Control Strategy for Three-Phase Four-Wire Converter with Unbalanced Load

Qi Yang (Zhejiang University); **Jiazhi Wang** (Zhejiang University); **Cong Chen** (Zhejiang University); **Tianyuan Xie** (Zhejiang University); **Wuhua Li** (Zhejiang University); **Xin Xiang** (Zhejiang University)

#529

Parameters Design for DC Voltage Loop Regulator and Phase-Locked Loop Regulator of Grid-Connected Inverter Under Weak Grid

Yiran Yan (Nanjing University of Aeronautics and Astronautics); **Xinbo Ruan** (Huazhong University of Science and Technology); **Jiang Zhan** (Nanjing University of Aeronautics and Astronautics); **Yichen Sun** (Nanjing University of Aeronautics and Astronautics); **Changyue Zou** (Electric Power Research Institute); **Yihong Huang** (Electric Power Research Institute)

#535

Stability-Guaranteed Harmonic Suppression Method for Inverters under Weak Grid

Jiang Zhan (Nanjing University of Aeronautics and Astronautics); **Xinbo Ruan** (Nanjing University of Aeronautics and Astronautics); **Yiran Yan** (Nanjing University of Aeronautics and Astronautics); **Yichen Sun** (Nanjing University of Aeronautics and Astronautics); **Ruijie Chang** (Nanjing University of Aeronautics and Astronautics); **Ting Hou** (Electric Power Research Institute); **Lingfei Li** (Electric Power Research Institute)

#541

Regenerative Snubber for Tapped-Inductor and Transformer Isolated Converters

Alexander Abramovitz (Tel-Aviv University); **Jia Yao** (Nanjing University of Science and Technology); **Keyue Smedley** (University of California, Irvine)

#547

Observer-Based Active Disturbance Rejection Control for Fraction-Delay Grid-Tied Inverters

Dingcheng Zhang (Hohai University); Qiang Qian (Hohai University); **Zhuolin Yang** (Hohai University); **Li Zhang** (Hohai University); **Jinming Xu** (Nanjing University of Aeronautics and Astronautics)

#549

Mid-frequency Oscillation Analysis and Suppression in Grid-following Renewable Energy and Grid-forming Energy Storage Hybrid Systems

Tiancheng Mu (Harbin Institute of Technology); **Jiandong Duan** (Harbin Institute of Technology); **Zongwei Yang** (Harbin Institute of Technology); **Hongzheng Wang** (Harbin Institute of Technology); **Haoran Pei** (Harbin Institute of Technology); **Ke Zhao** (Harbin Institute of Technology)

#557

Topology and Control of Nine-Level Hybrid T-Type Nested NPC Inverter

Ji-Hun Kim (Yeungnam University); **Dinh Du To** (Yeungnam University); **Dong-Choon Lee** (Yeungnam University)

P02: Energy Storage Systems

#18

Equivalent Implementation of ZVS-SVM with Carrier-based PWM scheme

Yuying Wu (University of Electronic Science and Technology of China); **Shun-peng Zhu** (University of Electronic Science and Technology of China); **Yousu Yao** (SolaX Power);

#151

Reduction in Quantity of Submodules in UC-FB-MMC by Injecting Zero-Sequence Voltage

Xinqun Chen (China Three Gorges Renewables (Group) Co., Ltd. Guangdong Branch); **Lei Zhang** (China Three Gorges Renewables (Group) Co., Ltd. Guangdong Branch); **Guowei Song** (China Three Gorges Renewables (Group) Co., Ltd. Guangdong Branch); **Yuebin Wang** (China Three Gorges Renewables Power Generation Co., Ltd.); **Weihan Hao** (China Energy Engineering Group Guangdong Electric Power Design Institute Co., Ltd.); **Jianwu Wang** (China Energy Engineering Group Guangdong Electric Power Design Institute Co., Ltd.); **Shida Sun** (China Energy Engineering Group Guangdong Electric Power Design Institute Co., Ltd.); **Zhengxuan Li** (Tsinghua university); **Qiang Song** (Tsinghua university)

#156

Research on DC Bus Floating On-Board Charger Based on CLLLC Converter Segment Modulation

Jianyuan Wang (Xi'an University of Technology); **Jidong Yang** (Xi'an University of Technology); **Junling Guo** (Xi'an University of Technology); **Shaoting Yan** (Xi'an University of Technology); **Hao Feng** (Inner Mongolia Power(Group) Co.,Ltd); **Rong Li** (CNPC);

#166

BEOP: A Framework enabling validation of real-world energy management systems

Sebastian Beichter (KIT); **Maximilian Beichter** (KIT); **Alexander Nöthel** (KIT); **Janik Pinter** (KIT); **Johannes Galenzowski** (KIT); **Kevin Förderer** (KIT); **Friedrich Wiegel** (KIT); **Tobias Moser** (KIT); **Simon Waczowicz** (KIT); **Ralf Mikut** (KIT); **Veit Hagenmeyer** (KIT)

#182

Analysis of Active RoCoF Response Power of Grid-forming System at Unit- and Plant-level

Siqi Wu (Aalborg University); **Fangzhou Zhao** (Aalborg University); **Xiongfei Wang** (KTH Royal Institute of Technology)

#191

Research on Fault Detection and Localization in Meshed DC Microgrids Based on Local Information Measurements

Na Zhi (Xi'an University of Technology); **Yiding Ding** (Xi'an University of Technology); **Hang Zhang** (Xi'an University of Technology); **Jilin Qiu** (Xi'an University of Technology);

#196

Thermal Impedance Parameters Identification for Power Modules Based on Measured Tj

Xinyue Zhang (Northwestern Polytechnical University); **Xiaohua Wu** (Northwestern Polytechnical University); **Jiacheng Sun** (Northwestern Polytechnical University); **Yi Zhang** (The Hong Kong Polytechnic University)

P02: Energy Storage Systems

#296

Model predictive control with two-parameter identification for input-independent-output-parallel dual-active bridge converters

Wenjie Du (Xi'an Jiaotong University); **Wenjie Chen** (Xi'an Jiaotong University); **Xu Yang** (Xi'an Jiaotong University);

#315

A High-Robust Control Scheme of DAB dc-dc Converter for DC Grid with Different Loads

Hongyu Chen (Tianjin University); **Nie Hou** (Tianjin University); **Jinwei He** (Tianjin University)

#324

A Nonlinear Droop Control Strategy Based on Bezier Curves in DC Microgrids

Qirui Wang (Shanghai Jiao Tong University); **Tieyan Zhang** (Shanghai Jiao Tong University); **Wei Liu** (COMAC Program Center); **Fei Gao** (Shanghai Jiao Tong University); **Xijun Yang** (Shanghai Jiao Tong University)

#338

Optimization Strategy for Power Allocation of Multiple PEM Electrolyzers in Frequency Regulation

Lixia Wang (Shandong University); **Tao Xu** (Shandong University); **Feng Gao** (Shandong University); **Lei Zhang** (Institute of Electrical Engineering, Chinese Academy of Sciences); **Wenqiang Lu** (Shandong University); **Xiaoli Chi** (Shandong University)

#347

Adaptive Grid-Connected and Islanded Control Method for Multi-Port Programmable SOP-Storage-Charger device

Xiaoli Chi (Shandong University); **Tao Xu** (Shandong University); **Feng Gao** (Shandong University); **Pengyu Su** (Shandong University); Lixia Wang (Shandong University)

#351

Research on the Hybrid Energy Storage Control Strategy for DC Microgrids Based on VIC-MPC

Na Zhi (Xi'an University of Technology); **Siyuan Li** (Xi'an University of Technology); **Hang Zhang** (Xi'an University of Technology); **Xiaobin Mi** (Xi'an University of Technology); **Shuai Chigan** (Xi'an University of Technology); **Peng Tian** (Xi'an University of Technology);

#383

Optimal planning considering distributed energy storage full life cycle of charge/discharge strategy

Songtao Zhang (State Grid Henan Xuchang Electric Power Supply Company); **Ke Song** (State Grid Henan Xuchang Electric Power Supply Company); **Gan Zhang** (State Grid Henan Xuchang Electric Power Supply Company); **Chen Xu** (State Grid Henan Xuchang Electric Power Supply Company); **Kunchi Yang** (Huazhong University of Science and Technology); **Weilin Chen** (Huazhong University of Science and Technology)

#389

Dual-Loop Quasi-Proportional-Resonant Control with Online Energy Balancing for Modular Multilevel Converters in Residential Energy Storage

Ruihao Li (Southeast University); **Qingsong Wang** (Southeast University)

P02: Energy Storage Systems

#408

High Efficiency Balancing Converter with Battery Impedance Measurement Function

Daming Wang (Electric Power Research Institute of China Southern Power Grid); **Cheng Peng** (Shanghai Jiao Tong University); **Zongxin Ye** (Shanghai Jiao Tong University); **Rui Li** (Shanghai Jiao Tong University)

#421 Title:

A Comprehensive Analysis to Achieve All Switches ZVS for Dual Active Bridge Converter Under Numerous Light-load Conditions

Jiachen Tian (Xi'an Jiaotong University); **Hongliang Zhang** (Xi'an Jiaotong University); **Chaoran Zhuo** (Xi'an University of Technology); **Pengyu Gao** (Xi'an Jiaotong University); **Jiayu Tang** (Xi'an Jiaotong University); **Mustafa Abu-Zaher** (Xi'an Jiaotong University); **Feng Wang** (Xi'an Jiaotong University)

#432

Optimized gate drive circuit design for improving dynamic current sharing in bidirectional SSCB applications

Wanjing Yin (University of Nottingham); **Ying Li** (University of Nottingham); **Paul Evans** (University of Nottingham); **Alan Watson** (University of Nottingham); **Jun Xie** (University of Nottingham); **Asad Fayyaz** (University of Nottingham)

#433

A Multi-Objective Optimization Control Method for Bidirectional Series Resonant Converter

Zhong Chen (Nanjing University of Aeronautics and Astronautics); **Renyu Li** (Nanjing University of Aeronautics and Astronautics); **Wei Liu** (Nanjing University of Aeronautics and Astronautics); **Jiakai Gan** (Nanjing University of Aeronautics and Astronautics)

#450

Coordinated Planning of Hybrid Energy Storage System Based on Adaptive Decomposition Domain in Distribution Networks

songlin jiang (Shanghai University); **Fei Wang** (Shanghai University); **Hui Guo** (Shanghai University); **Songmei Wu** (Shanghai University); **Zhilong Wan** (Shanghai University); **Hao Liu** (Shanghai University)

#451

Distribution Network Investment Optimization with Extended Interface

Jiayin Liu (Capital University of Economics and Business); **Qian Xu** (North China Electric Power University)

#497

An Isolated Multiport Modular Multilevel DCDC Converter for Electric Vehicle FastCharging Station

Milad Rasoulikhatir (Lakehead University); **Qiang Wei** (Lakehead University)

#498

Closed-Loop Control of a Novel Modular MultiLevel DC-DC Converter for EV Charging Station

Milad Rasoulikhatir (Lakehead University); **Qiang Wei** (Lakehead University)

P02: Energy Storage Systems

#520
Bypass Equalization Strategy of Li-ion Battery Based on LSTM Prediction of State of Charge

Yuzhen Long (Sichuan University); **Qiao Peng** (Sichuan University); **Shaoxin Shi** (Sichuan University); **Junjie Xiang** (Sichuan Puli Technology Co.,Ltd); **Qiang Hua** (Sichuan Puli Technology Co.,Ltd)

#530
DC Fault Ride-Through-Oriented Coordinated Control Strategies for MMC with Integrated Battery Energy Storage System

Tianyu You (Sichuan University); **Shunliang Wang** (Sichuan University); **Yuxuan Duan** (Sichuan University); **Junpeng Ma** (Sichuan University); **Tianqi Liu** (Sichuan University)

#551
Dynamic Power Allocation of Hybrid Power System Considering Circulating Current Suppression

Wanxia Lei (Northwestern Polytechnical University); **Liang Xu** (Nanjing Engineering Institute of Aircraft Systems, AVIC); **JinXin Liu** (Northwestern Polytechnical University); **Wenli Yao** (Northwestern Polytechnical University); **Xiaobin Zhang** (Northwestern Polytechnical University); **Xinan Zhang** (University of Western Australia)

#552
Variable Form Extended State Observer-Based Power Compensation for Dynamic Peak Loads in DC Active Distribution Networks with HESS

Bo Wang (Tianjin University); **Shouxiang Wang** (Tianjin University); **Qianyu Zhao** (Tianjin University); **Luyang Guo** (Tianjin University); **Shuo Li** (Tianjin University); **Yuhong Zhang** (Nanjing University of Aeronautics and Astronautics)

#554
A Joint Optimization Strategy for Demand Management and Peak-Valley Arbitrage of Industrial and commercial Loads Based on Sodium-Ion Battery Energy Storage System

Xinfu Wang (Shandong University); **Hao Tian** (Shandong University); **Feng Gao** (Shandong University)

#555
Seamless Transition of Islanded PV-Battery DC Microgrid Based on Voltage Regulation

Zongwen Zhang (Shanghai Jiao Tong University); **Jianbiao Li** (DC Power Distribution and Consumption Technology Research Centre of Guangdong Power Grid Co., Ltd.); **Yong Chen** (DC Power Distribution and Consumption Technology Research Centre of Guangdong Power Grid Co., Ltd.); **Zhiwei Wu** (Shanghai Jiao Tong University); **Fei Gao** (Shanghai Jiao Tong University)

#560
Soft-Switching Stack-Type Three-Level/Two-Level Hybrid Buck-Boost Converter with Reduced Inductor Current Ripple

Hongsen Yu (Huazhong University of Science and Technology); **Jiawei Guo** (Huazhong University of Science and Technology); **Li Zhang** (Huazhong University of Science and Technology); **Tianxiang Yin** (Huazhong University of Science and Technology); **Lei Lin** (Huazhong University of Science and Technology)

#578
Unknown Input Observer-Based SOC Estimation for Lithium-ion Batteries with Current Sensor-Free and Voltage Bias

Hanyuan Zhou (Shandong Normal University); **Xinmin Song** (Shandong Normal University); **Rui Zhu** (Shandong Normal University)

P03: Power Converters

#12
A Novel Current Source Converter-Based Ultra-High-Power Wind Energy Conversion System
Kaiwen Yang (Lakehead University); **Zijian Wang** (Lakehead University); **Qiang Wei** (Lakehead University)

#197
Magnetic Integration in BCM based Single-Phase Transformerless PV Inverters
Chen Liu (Aalborg University); **Yongjie Liu** (Aalborg University); **Frede Blaabjerg** (Aalborg University); **Pooya Davari** (Aalborg University)

#209
Enhanced Deadbeat Predictive Voltage Control for LCL-Filtered Motor Emulator With ESO-Based Parameter Mismatch Adaptation
Xuan Luo (Xi'an Jiaotong University); **Zipeng Liu** (Xi'an Jiaotong University); **Jianhong Zhao** (Xi'an Jiaotong University); **Jinjun Liu** (Xi'an Jiaotong University)

#221
A Clamping Circuit Design for Reflected Voltage of Dual Switch Flyback Converter
Yixin Zhu (Jiangnan University); **Langlang Wang** (Jiangnan University); **Xueda Hui** (Jiangnan University); **Qihang Wang** (Jiangnan University); **Dezhi Xu** (School of Electrical Engineering, SEU)

#255
An Accurate Analytical Model for Wide Bandgap Devices Considering Dynamic Parasitic Parameters
Yulu Du (Southeast University); **Jiangfeng Wang** (Southeast University); **Yuqing Wu** (Southeast University); **Yubo Yuan** (Ltd. Research Institute State Grid Jiangsu Electric Power Company); **Ruihuang Liu** (Ltd. Research Institute State Grid Jiangsu Electric Power Company); **Wu Chen** (Southeast University)

#282
Robust Predictive Deadbeat Control for Three-Phase Buck PWM Rectifier
Xu Wei (Nanjing University of Aeronautics and Astronautics); **Wenxin Huang** (Nanjing University of Aeronautics and Astronautics)

#286
A Model-free Predictive Control Strategy for dVOC Conventer Under Unbalanced Grid Voltages
Jianchao Wang (Shandong University); **Pengfei Qi** (Shandong University); **Jin Liu** (Shandong University); **Guanguan Zhang** (Shandong University); **Alian Chen** (Shandong University); **Rui Huang** (State grid shandong electric power company); **Mu Fang** (State grid shandong electric power company); **Xinbin Zuo** (State grid shandong electric power company)

#294
A Stabilization Control Strategy for SVG to Mitigate Subsynchronous Oscillations Caused by PMSG-Based Wind Farms
Xingyu Han (Shanghai Jiao Tong University); **Han Wang** (Shanghai Jiao Tong University); **Simin Wu** (State Grid Shanghai Municipal Electric Power Company); **Jing Lyu** (Shanghai Jiao Tong University); **Xu Cai** (Shanghai Jiao Tong University)

P03: Power Converters

#322
Per-Unit Impedance Modeling and Configurable Decentralized Stability Conditions for Multi-Parallel GFM Inverter Systems

Feifan Chen (KTH Royal Institute of Technology); **Liang Zhao** (KTH Royal Institute of Technology); **Lennart Harnefors** (ABB Corporate Research); **Xiaonan Gao** (KTH Royal Institute of Technology); **Mikko Routimo** (ABB Oy Drives); **Jarno Kukkola** (ABB Oy Drives); **Xiongfei Wang** (KTH Royal Institute of Technology)

#327
An Innovative Full-Bridge Multiplexing Arm Modular Multilevel Converter with DC Fault Blocking Capability

Zeyu Hao (Southeast University); **Jianxi Lan** (Southeast University); **Wu Chen** (Southeast University); **Xundong Gong** (State Grid Suzhou Electric Power Co Ltd); **Min Ding** (State Grid Suzhou Electric Power Co Ltd); **Qiong Zhu** (State Grid Suzhou Electric Power Co Ltd); **Junting Li** (State Grid Suzhou Electric Power Co Ltd)

#354
Single-Phase L-type Bridge Inverter with Parallel Active Power Filter

Haitham Elmasry (University of New Brunswick); **Shuang Xu** (University of New Brunswick); **Shufeng Zhang** (University of New Brunswick); **Xiaochen Zhu** (North China University of Technology); **Saleh Saleh** (University of New Brunswick); **Liuchen Chang** (University of New Brunswick);

#358
Accurate Arm Current Estimation for Dead-Time Compensation in Modular Multilevel Converters

Ming Jia (Flexible Electrical Networks GmbH); **Kyungwoo Kim** (RWTH Aachen University); **Zhan Ma** (Shandong University); **Rik W. De Doncker** (RWTH Aachen University)

#369
Optimized ZVS Analysis and Parameter Design for LLC Converter With Parasitic Capacitance

Shaoliang An (Xi'an University of Technology); **CHANG TIANHAO** (Xi'an University of Technology); **Hang Wang** (Xi'an University of Technology); **Yikang Zhang** (Xi'an University of Technology)

#380
Junction temperature measurement of freewheeling diode in IGBT module based on emitter parasitic inductance voltage undershoot

Chun He (Chongqing University); **Pengju Sun** (Chongqing University); **Chenhao Tang** (Chongqing University)

#388
Stability Analysis of Distribution System with Active Front-end Converters

Xingqi Liu (University of nottingham); **Giampaolo Buticchi** (University of nottingham); **jiajun yang** (University of nottingham); **Zhixiang Zou** (School of Electrical Engineering Southeast University)

P03: Power Converters

#393

Analysis of Output Voltage Characteristics and Voltage Limiting Methods for LLC-DCX Converters

Jiali Tang (Nanjing University of Aeronautics and Astronautics); **Chunying Gong** (Nanjing University of Aeronautics and Astronautics); **Weikang Xing** (Nanjing University of Aeronautics and Astronautics); **Huiyi Yang** (Nanjing University of Aeronautics and Astronautics)

#394

Optimized Heat Pipe Array Heat Sink for Thermal Management of Power Modules of High Overcurrent Capability

Yanhe Shi (Zhejiang University); **Xiangbo Huang** (Zhejiang University); **Zan Wu** (Zhejiang University); **Kuang Sheng** (Zhejiang University)

#407

Hierarchical Adaptive Control for Power Balancing in Single-Phase CHB

wei luo (Shanghai Jiao Tong University); **Muhammad Khan** (Shanghai Jiao Tong University)

#409

Research on High-Voltage Isolated Gate Driver Based on Wireless Power Transfer Technology

Xiaowen Hou (Harbin Institute of Technology); **Lingling Cao** (Harbin Institute of Technology)

#428

Analysis and Suppression of the Beat Frequency Oscillation in Buck-derived Front-end Cascaded Power Supply System

Xin Li (Southeast University); **Haoxiang Sun** (Southeast University); **Weike Yu** (Southeast University); **Haohan Fang** (Southeast University); **Jianing Li** (Southeast University); **Wu Chen** (Southeast University)

#437

Fault Analysis of High-Voltage DC Transfomers for 100-MW-Scale All-DC Renewable Energy Transmission

Qiaozhen Hu (Tsinghua university); **Xueyin Zhang** (Tsinghua university); **Bin Cui** (Tsinghua university); **Biao Zhao** (Tsinghua university); **Yi Lu** (State Grid Zhejiang Electric Power Co.,Ltd.Electric Power Research Instidute)

#467

Reliability-Oriented Analysis of PWM Strategies in Three-Level Converters in PV Systems

BoXue Zhang (The Chinese University of Hong Kong); **Mateja Novak** (Aalborg University); **Frede Blaabjerg** (Aalborg University); **Poh Chiang Loh** (The Chinese University of Hong Kong)

#469

A Virtual Excitation-Based Method for Self-Impedance Measurement of Three-Phase Converters

Han Mu (Eindhoven University of Technology); **Zheran Zeng** (Eindhoven University of Technology); **Dongsheng Yang** (Eindhoven University of Technology); **Yin Sun** (Shell Global Solution International B.V.); **Xiongfei Wang** (KTH Royal Institute of Technology)

P03: Power Converters

#470
An Optimal PWM Selection Strategy for Three-Level NPC Converter in a Wide Operating Range

BoXue Zhang (The Chinese University of Hong Kong); **Mateja Novak** (Aalborg University); **Frede Blaabjerg** (Aalborg University); **Poh Chiang Loh** (The Chinese University of Hong Kong)

#472
Coordinated Active-Inertia Support Strategy for Integrated Three-Port Power Router

Zhixian Liao (Harbin Institute of Technology); **Binbin Li** (Harbin Institute of Technology); **Yingzong Jiao** (Harbin Institute of Technology); **Xuhui Zheng** (Harbin Institute of Technology); **YiLun Zhang** (Harbin Institute of Technology); **Dianguo Xu** (Harbin Institute of Technology)

#481
Droop Control Strategy for Inverter-based Thermostatically Controlled Load Cluster Based on Frequency Threshold Preset Scheme in Hybrid Frequency Regulation Mode

Xuhao Zhang (Tsinghua Sichuan Energy Internet Research Institute); **Te Zhou** (Tsinghua Sichuan Energy Internet Research Institute); **Xiaoqiang Zhang** (Southwest University of Science and Technology); **Ning Zhang** (Tsinghua University)

#488
Asymmetric Quasi-Square Wave Modulation for T-type Transformerless Modular Multilevel DC-DC Converter with Reduced Current Stress

Hao Zhang (Zhejiang University);**Yipeng Su** (Zhejiang University); **Ke Cheng** (Zhejiang University); **Heya Yang** (Zhejiang University); **Xin Xiang** (Zhejiang University); **Jing Sheng** (Zhejiang University); **Wuhua Li** (Zhejiang University); **Xiangning He** (Zhejiang University)

#507
High-Gain Low-Ripple Interleaved DC-DC Converter with Wide Operating Range

Erfan Azimi Bizaki (Lakehead University); **Qiang Wei** (Lakehead University)

#518
Synchronous Harmonic Suppression Strategy for MSFW Based on Improved Resonant Controller

Zhuoqiang Tan (State Grid Hangzhou Xiaoshan Power Supply Company); **Yanjia Fan** (State Grid Hangzhou Xiaoshan Power Supply Company); **Xucong Bao** (Nanjing University of Aeronautics and Astronautics); **Hui Yan** (Nanjing University of Aeronautics and Astronautics); **Yongsheng Ren** (State Grid Hangzhou Xiaoshan Power Supply Company); **Jianming Yu** (State Grid Hangzhou Xiaoshan Power Supply Company)

#582
Comparative study of compact DPP topologies for partial shading mitigation of PV modules

Jiahui Ma (Nanjing University of Aeronautics and Astronautics); **Ke Jin** (Nanjing University of Aeronautics and Astronautics); **Weiyang Zhou** (Nanjing University of Aeronautics and Astronautics)

P04: Emerging Topics For Distributed Generation

#6

Principal Component and Physical Quantities Enhanced Logistic Regression for Electric Load Classification

Zhenyu Hou (Shandong University); **Feng Gao** (Shandong University); **Kangjia Zhou** (Shandong University); **Yusen Zhang** (Shandong University)

#27

An Instantaneous Power Theory Extension For Unbalanced Low Voltage Ride Through Compensation

Fankai Wen (Nanyang Technological University); **Pablo Acuna** (University of Talca); **Amer Ghias** (Nanyang Technological University); **Ricardo Aguilera** (University of Technology, Sydney); **Luis Moran** (Universidad de Concepcion); **Santiago Maure** (University of Talca)

#75

Stability Assessment of Self-synchronizing Active Damper

Yuan Feng (Harbin Institute of Technology); **Rongwu Zhu** (Harbin Institute of Technology)

#90

Distributed Event-Triggered Voltage and Frequency Control for dVOC-Based Microgrids

Qiang Zhang (Shandong University); **Guanguan Zhang** (Shandong University); **Jin Liu** (Shandong University); **Jianchao Wang** (Shandong University)

#99

Power Oscillation Suppression by Improved Control Strategy for DFIG-Based Wind Turbine

Weihao Hu (Harbin Institute of Technology); **Rongwu Zhu** (Harbin Institute of Technology)

#108

Improved Modulation Strategy for Single-Phase Integrated Wireless Charging System

Xin Felix Chen (City University of Hong Kong); **Chi K. Tse** (City University of Hong Kong); **Qianhong Chen** (Nanjing University of Aeronautics and Astronautics)

#163

A Novel Multiple Fourier Series Modeling for PWM Pulses Formed by Modulation Signals with Time-Varying Amplitude and Frequency

Yue Cui (Huazhong University of Science and Technology); **Han Peng** (Huazhong University of Science and Technology)

#168

High-Order Exponential Integrator with Network Decoupling for Numerically Efficient Simulation of Large-Scale Power Electronic Systems

Jared Paull (The University of British Columbia Okanagan); **Hengyu Li** (The University of British Columbia Okanagan); **Liwei Wang** (The University of British Columbia Okanagan); **Wei Li** (OPAL-RT Technologies)

P04: Emerging Topics For Distributed Generation

#226
Research on Non-Communication Control Strategy for High/Low Voltage Valve Groups of UHVDC Transmission System Based on Site-Division Construction

Haiyang Huang (North China Electric Power University); **Haowei Yuan** (North China Electric Power University); **Xiaoling Xiong** (North China Electric Power University); Xiaopeng Li (State Grid Sichuan Electric Power Research Institute); Lei Liu (State Grid Sichuan Electric Power Research Institute); Ying Xu (State Grid Economic and Technological Research Institute Co., Ltd)

#249
A Cost-Effective Method for Capacitor Placement Considering Volt-Var Optimization and Voltage Sags

Amirsaleh Norouzmahani (University of Kerman); **Sina Shakeri** (Flinders University); **Amin Mahmoudi** (Flinders University); **Solmaz Kahourzade** (University of South Australia); **Apel Mahmud** (Flinders University); **Saeid Esmaeili** (University of Kerman)

#259
Support Vector Regressor-based SiC MOSFET Junction Temperature Prediction based on Temperature Sensitive Electrical Parameters and External Dependencies

Shuheng Chen (University of New South Wales); **Ye Zhu** (University of New South Wales); **Georgios Konstantinou** (University of New South Wales)

#265
Impact of DC-link Voltage Loop on Active Damper Stability

Yuan Feng (Harbin Institute of Technology); **Rongwu Zhu** (Harbin Institute of Technology)

#278
Communication-Free Coordination Control Strategy for LFAC Offshore Wind Power System Based on CSC

haiyan chen (Electric Power Planning & Engineering Institute); **Ruiqi Zhan** (Electric Power Planning & Engineering Institute); dingteng feng (North China Electric Power University); **Xiaoling Xiong** (North China Electric Power University); **Chenhao Yao** (North China Electric Power University); **Chengyong Zhao** (North China Electric Power University); **Yunxiao Zhang** (Electric Power Planning & Engineering Institute)

#280
Research on Smooth Grid-Connected and Islanding Transitions Control Strategy for Microgrid Inverters Based on State Machine Theory

HuaLong Sun (Nanjing University of Aeronautics and Astronautics); **Zhenyang Hao** (Nanjing University of Aeronautics and Astronautics)

#330
A Novel High Efficiency Soft Open Point Suitable for 10kV Grid Interconnection

Yutong Chen (Southeast University); **Wu Chen** (Southeast University); **Haixi Zhao** (Southeast University); **Xuze Wang** (Southeast University); **Runyan Sha** (Southeast University); **Yubo Yuan** (the State Grid Jiangsu Electric Power Company); **Chenqing Wang** (the State Grid Jiangsu Electric Power Company); **Shi Chen** (the State Grid Jiangsu Electric Power Company)

P04: Emerging Topics For Distributed Generation

#337
Sub/Super-Synchronous Oscillation Analysis and Impedance Optimization Design of Wind Power VSC-HVDC Interconnected Systems

Xiao Zhou (China Electric Power Research Institute); **Yuexi Yang** (China Electric Power Research Institute); **Yu BAI** (China Electric Power Research Institute); **Zhenyu Du** (China Electric Power Research Institute); **Zhan Shu** (State Grid Jiangxi Electric Power Research Institute); **Feng Zhao** (North China Branch of State Grid Corporation of China)

#348
Maximum Efficiency Point Tracking Control for the Liquid-Electric Conversion Process in Ocean Thermal Energy Generation

Qingqing Xu (Shandong University); **Hao Tian** (Shandong University); **Feng Gao** (Shandong University)

#365
Control Strategy of Multi-Voltage Output Emergency Power Supply System Based on Dual-Stator Winding Induction Generator

Feilong Jiang (Nanjing University of Aeronautics and Astronautics); **Yajun Zhao** (Nanjing University of Aeronautics and Astronautics); **Feifei Bu** (Nanjing University of Aeronautics and Astronautics); **Peng Xue** (Nanjing University of Aeronautics and Astronautics); **Yikun Tian** (Nanjing University of Aeronautics and Astronautics)

#367
A compact three-winding transformer-based power quality management topology for multi-line urban distribution network

Xin Li (Southeast University); **Peili Yuan** (Southeast University); **Jianing Li** (Southeast University); **Weike Yu** (Southeast University); **Xiaochun Mou** (State Grid Electric Power Research Institute/NARI Group Corporation); **Xiaofeng Dong** (State Grid Jiangsu Electric Power Company)

#416
A Study on the Temperature Characteristics of RC-IGBT

Yaning Wen (North China Electric Power University); **Zhonghao Dongye** (North China Electric Power University); **Huanqi Li** (North China Electric Power University); **Bowen Gu** (North China Electric Power University); **Lei Qi** (North China Electric Power University)

#418 Title:
EMI Prediction in Power Converters Through CST Field-Circuit Co-Simulation

Jun Zhan (Nanjing University of Aeronautics and Astronautics); **Qingao Ge** (Nanjing University of Aeronautics and Astronautics); **Ziliang Zhang** (Nanjing University of Aeronautics and Astronautics); **Rongxuan Zhang** (Nanjing University of Aeronautics and Astronautics); **Chunying Gong** (Nanjing University of Aeronautics and Astronautics)

P04: Emerging Topics For Distributed Generation

#420
A Communication-less Synchronous Frequency Restoration Strategy Based on Voltage Zero-crossing Detection for Islanded Microgrid

xiao zhang (Xi'an Jiaotong University); Ya Wen (Xi'an Jiaotong University); **Yueqian Bai** (Xi'an Jiaotong University); **Hao Yi** (Xi'an Jiaotong University); **Fang Zhuo** (Xi'an Jiaotong University); **Feng Wang** (Xi'an Jiaotong University)

#429
Equivalent 3D Electric Field Modeling of Wound Transformers with Complex Insulating Media

Ce Xu (Nanjing Vocational Institute of Railway Technology); **Fanghua Zhang** (Nanjing University of Aeronautics and Astronautics); **Chuang Zhou** (Nanjing University of Aeronautics and Astronautics); **Han Bu** (Nanjing University of Aeronautics and Astronautics)

#456
Optimizing Over-Current Relay Coordination: The Role of Entropy Evolution in Gravitational Search Strategy

Mubashar Javed (COMSATS University Islamabad); **Laiq khan** (COMSATS University Islamabad); **Yasir Muhammad** (COMSATS University Islamabad); **Amin Mahmoudi** (Flinders University); Solmaz Kahourzade (University of South Australia); **Ahsan Zafar** (Tianjin University)

#460
Research on the Construction of Transformer Fault Diagnosis Simulation System Based on Digital Twin Technology

Juan Ma (State Grid Anhui Electric Power Company Training Center); **Jiehong Xu** (State Grid Anhui Electric Power Company Training Center); **Xuelei Fang** (State Grid Anhui Electric Power Company Training Center); **Ning Zhang** (State Gird Anhui Ultra High Voltage Company); **Taishan Yan** (State Grid Hefei Power Supply Company of State Grid Anhui Electric Power Co. Ltd.); **Tiezhu Li** (State Grid Hefei Power Supply Company of State Grid Anhui Electric Power Co. Ltd); **Dinghui Shen** (State Grid Lu'an Electric Power Supply Company of State Grid Anhui Electric Power Co. Ltd)

#473
A Simplified Frequency-domain Thermal Coupling Model Combining Heat Flow Paths

Letian Lu (Shanghai Jiaotong University); **Tianle Cai** (Shanghai Jiaotong University); **Wenping Zhang** (Ginlong Technologies Co., Ltd.); **Ke Ma** (Shanghai Jiao Tong University)

P04: Emerging Topics For Distributed Generation

#476
Grid-forming Control and Startup Strategy for Diode Rectifier Unit Based Offshore Wind Power System

Youhong Fang (Hefei University of Technology); **Zhen Xie** (Hefei University of Technology)

#495
Flexible Grid-forming Control Based on Decoupled Structure for PMSG Wind Turbines

Zhijun Ma (Xi'an Jiaotong University); **Zhiheng Huang** (Xi'an Jiaotong University); **Tong Wu** (Xi'an Jiaotong University); **Boyang Shen** (Xi'an Jiaotong University); **Ronghui An** (Xi'an Jiaotong University); **JinJun Liu** (Xi'an Jiaotong University)

#546
Research on Power Supply and Communication Methods for Wireless Power Transmission Systems

Lei Yang (Xi'an University of Technology); **Zhixue Bu** (Xi'an University of Technology); **Liye Tian** (Xi'an University of Technology); **Dengrui Xing** (Xi'an University of Technology)

#561
Disturbance Identification in Low-Voltage Direct Current Systems Based on Wavelet Transform

Yifan Qin (Xi'an Jiaotong University); **Yong Chen** (Zhuhai Power Supply Bureau of Guangdong Power Grid Co., Ltd.); **Jianbiao Li** (Hengqin Digital Zero Carbon Island Communal Laboratory); **Nana Chang** (Xi'an University of Technology); **Guobing Song** (Xi'an Jiaotong University)

#579
Wide-Range Droop Enhancement Design based on Admittance Analysis for Hybrid Droop Control DC

Chen PoHan (Tsinghua university); **Kai Sun** (Tsinghua university)

HUAWEI

构建万物互联的智能世界

华为数字能源

融合数字技术和电力电子技术

发展清洁能源与能源数字化

推动能源革命，共建绿色美好未来

8倍
超宽范围

双档位
一键切换

Chroma
Advancing Excellence

双向电源＋能源回收负载

62450D-2000HL

- 道路车用LV123法规初测
- 电池及燃料电池模拟
- 高功率密度360kW@41U Rack
- 太阳能阵列模拟（选配）
- 支援高速HIL数位AURORA界面<50μs（选配）
- CE/RoHS认证

45kW
最大功率

180A
最大电流

2100V
最大电压

立即了解更多

致茂电子股份有限公司　中茂电子（深圳）有限公司　www.chroma.com.cn　info@chromaate.com

SOLAX POWER | BVB 09 PARTNER

SOLAX POWER

13 YEARS OF COMMITMENT IN ENERGY STORAGE

Residential Storage

Utility Storage

C&I Storage

- Fast Deployment, Instant Power
- Easy Installation, Time-Saving
- Cost-Effective, High Returns
- Smart Management, Optimal Efficiency

The Energy Transition Starts with SolaX Power!

Founded in 2012, SolaX Power is your trusted partner for tailored energy storage solutions.Whether it's for residential, commercial, or industrial applications, we make every ray of sunlight more valuable.

Complete Energy Storage Solutions, One-Stop!

With over 13 years of expertise and more than 1.4 million systems shipped globally, SolaX Power provides innovative, end-to-end solutions that ensure perfect system synergy and consistent quality. Choose SolaX for a more sustainable and prosperous future!

solaxpower

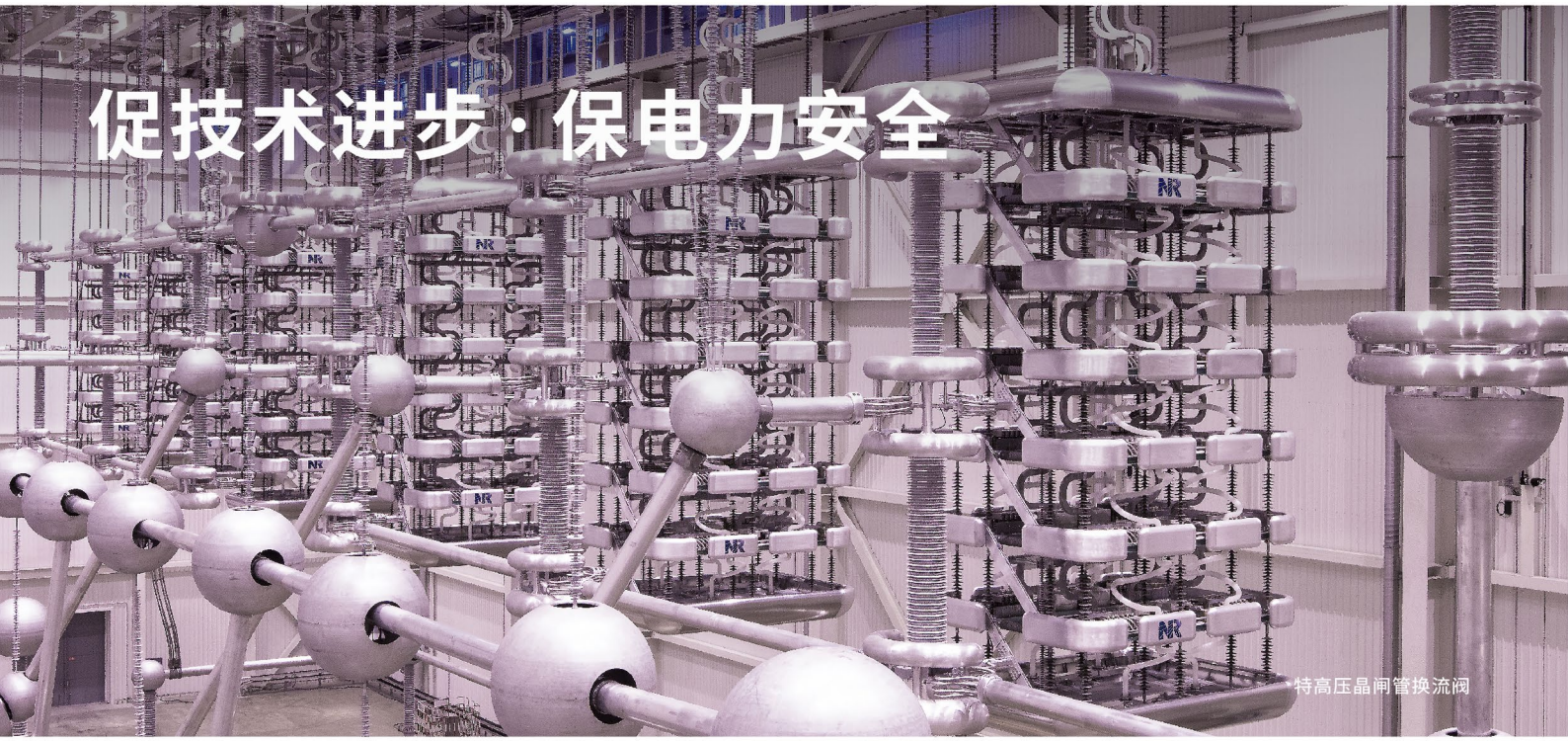
www.solaxpower.com

info@solaxpower.com

南瑞继保
NR ELECTRIC

务实 求精 协作 创新
Practice Improvement Cooperation Innovation

促技术进步·保电力安全


特高压晶闸管换流阀

南京南瑞继保电气有限公司

南京南瑞继保电气有限公司（简称“南瑞继保”）主要从事电力保护控制、智能电力装备和工业过程控制的研发和产业化，是国家重点高新技术企业、国家技术创新示范企业，中宣部确定的企业自主创新全国重大宣传典型。获评国家卓越工程师团队、国家制造业单项冠军、国家智能制造示范工厂、国家绿色工厂、江苏省省长质量奖、江苏省优秀企业。中国工程院沈国荣院士担任公司董事长。

国务院 国家卓越工程师团队

中宣部 全国八大自主创新重大典型

国资委 创新型国家建设重点企业

工信部 国家制造业单项冠军

工信部 国家技术创新示范企业

能源局 国家能源电力控制保护技术研发（实验）中心

南瑞继保核心产品市场占有率高，继电保护产品在 220kV 及以上电压等级的国内市场占有率近 40%，产品广泛应用于三峡输变电、“西电东送”、北京奥运、上海世博、杭州 G20 等国家重点工程。公司的继电保护、电网安全稳定控制、高压交直流输电控制保护等技术打破了国外公司的长期技术和产品垄断，以其先进性、实用性和可靠性，提高了我国电网安全稳定运行水平。

About NR Electric

NR Electric's headquarters is located in Nanjing, with research and industrialization bases established in both Nanjing and Changzhou. The company has set up regional sales and technical service centers in eight domestic locations, including Beijing, Guangzhou, and Xi'an. Additionally, it has established international branches and localized technical service centers across various continents, including in the United Kingdom, Indonesia, Malaysia, and Nigeria.

NR Electric(NR), as a power stability expert, is dedicated to provide smart, reliable and environmental friendly solutions for power generations, power grid and industries. The products and solutions covers protection, automation & control, HVDC & FACTS, renewable & micro-grid and engineering consulting & services.

- Mature and intelligent protection, automation and control solutions proven by over 18,000+ substations worldwide with highest voltage level of 1,000kV
- Vast experience from implementing 5,000+ digital substation projects
- State-of-the-art VSC-HVDC transmission solutions supporting world's first ±500kV DC grid and ±800kV hybrid multi-terminal HVDC
- High reliable LCC-HVDC transmission solutions up to ±1100kV
- World leading supplier for Grid Forming Technology and Products: GFM BESS, GFM STATCOM, GFM HVDC
- World Top 5 FACTS Supplier, 700+ sets of SVC and STATCOM maximum size up to 900Mvar for SVC and 350MVar for STATCOM

南京南瑞继保电气有限公司
NR ELECTRIC CO., LTD.
地 址 南京市江宁区苏源大道69号
邮 编 211102
电 话 025-8717 8911 / 5210 7703
传 真 025-8717 8997

上海科梁信息科技股份有限公司
Shanghai KeLiang Information Technology Co., Ltd.

SimuNPS

www.simunps.com

新型电力系统建模仿真软件

完全自主可控 欢迎申请试用

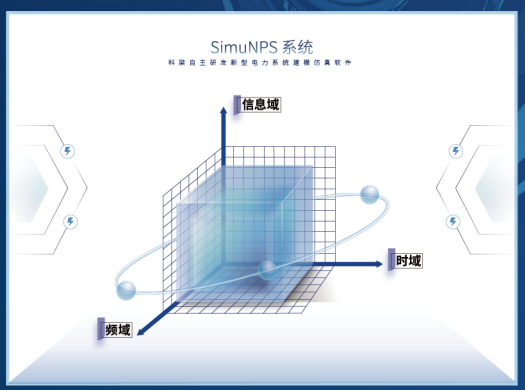
扫码申请试用

SimuNPS V3.0概述

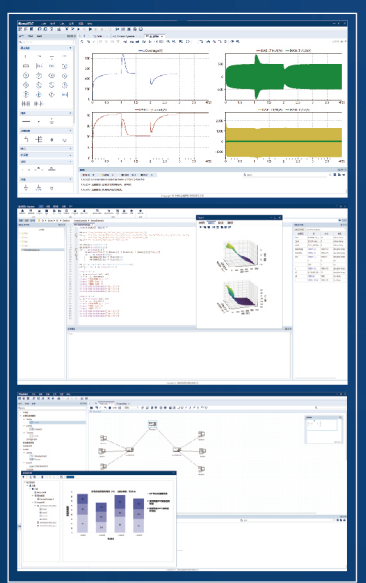
新型电力系统是近几年才提出的新概念，也是高速发展变化的一个新领域，虽然每个专家都有不同的解读，但有几点是各方已达成的共识：

- 新型电力系统是“高比例新能源、高比例电力电子化与传统同步机混合”的“宽频”特征电力系统（时域仿真+频域仿真）；
- 新型电力系统是信息物理融合的新型智慧能源系统（信息物理联合仿真）；
- 新型电力系统是多能互补的综合能源系统（多能源仿真）。

SimuNPS软件自发布以来，得到了业内广泛的关注和赞誉，同时也收到了大量的反馈和建议；科梁通过和用户的深入交流，研究新型电力系统特征和用户需求，联合业内专家，创造性地开发了SimuNPSV3.0版本，这是首款融合时域、频域、信息域和多能域，同时支持麒麟等国产操作系统的新型电力系统综合建模仿真软件，SimuNPS软件现已面向全球正式开放了试用申请。



SimuNPS在时域、频域、信息域提供全面的仿真分析功能



SimuNPS软件界面

上海总部
地址：上海市合川路3533号
虹创园8号楼（201103）
电话：021-54234718/19/20
传真：021-54234721

西安分公司
地址：西安市经济技术开发区
凤城十二路未十二广场15层（710018）
电话：029-86263605
传真：029-86297216

北京分公司
地址：北京市海淀区首体南路22号
国兴大厦9层09D室（100044）
电话：010-83168982
传真：010-82168982

长沙子公司
地址：长沙高新开发区青山路699号
国家网络安全产业园区（长沙）8B栋10楼
电话：0731-85560780
传真：0731-85560780

ITECH

全方位电源解决方案供应商

ITECH 助力绿色未来

测试仪器

- 交/直流电源
- 交/直流电子负载
- 功率分析仪
- 电池内阻测试仪
- 电网模拟器
- 高精度源表SMU

测试系统

- 电源自动化测试系统
- 电池&燃料电池测试/模拟系统
- 太阳能阵列测试/模拟系统
- 车载充电机/DC-DC测试系统
- 交直流充电桩测试/模拟系统
- 便携式交流充电装置测试系统
- 老化测试系统

解决方案与应用

- 电源/电池测试解决方案
- 半导体/工业电子/LED 测试解决方案
- 光伏/智能电网测试解决方案
- 新能源/汽车电子测试解决方案
- 5G通讯/IOT/医疗电子测试解决方案
- 教育/军工/航空航天测试解决方案

艾德克斯电子有限公司
ITECH ELECTRONICS

电话：4006-025-000
网址：www.itechate.com

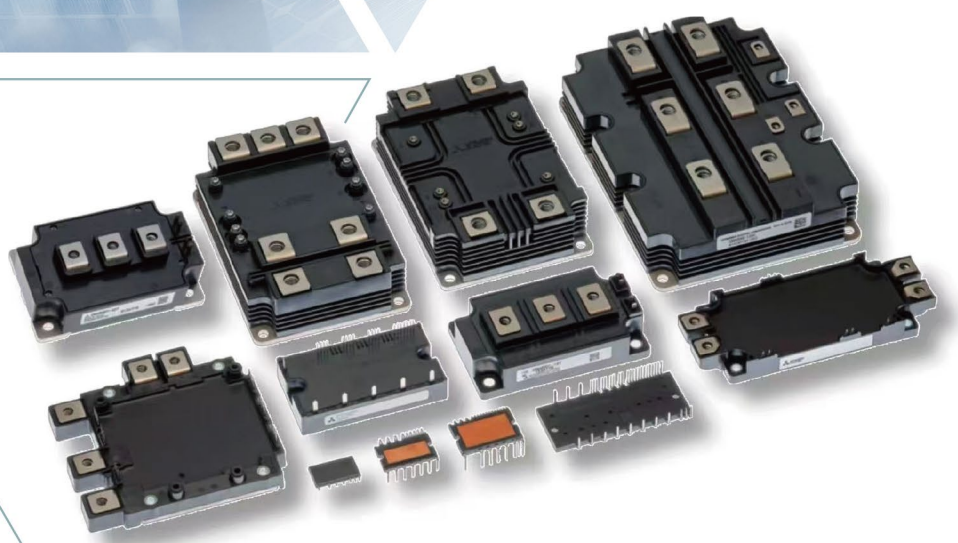
ITECH 官网　　ITECH 官微

MITSUBISHI ELECTRIC
Changes for the Better

功率器件
带来的能源革命

支持变频家电、工业驱动、新能源利用、
铁道牵引和电力传输市场的建设
为实现低碳社会和富裕生活做出贡献

- 功率芯片
- SLIMDIP™
- DIPIPM+™
- SOPIPM™
- DIPIPM™
- IPM
- IGBT模块
- Hybrid-SiC模块
- 二极管模块
- HVIGBT模块
- Full-SiC模块
- EV模块



三菱电机半导体微信公众号
扫一扫 关注我

株洲中车时代半导体有限公司

用芯驱动人类绿色交通和能源的可持续发展

株洲 总部

株洲中车时代半导体有限公司
研发中心、营销中心、运营中心
8英寸IGBT产业化基地
8英寸SiC器件产业化基地
6英寸双极器件产业化基地

宜兴

宜兴中车时代半导体有限公司
中低压功率器件产业化基地

广州

广州青蓝半导体有限公司
新能源汽车用IGBT封装生产线

武汉

智新半导体有限公司
新能源汽车用IGBT封装生产线

英国

英国丹尼克斯半导体有限公司
功率半导体林肯研发中心
6英寸功率半导体器件产业化基地

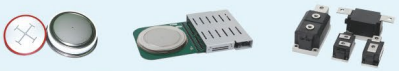
IGBT芯片及模块

产品覆盖650V-6500V全电压等级IGBT，具有高电流密度、低开关损耗、高短路功能、低导通压降、软关断特性、裕量大等特点，可满足智能电网、轨道交通、新能源汽车、新能源发电、工业控制等多个领域应用需求。

SiC功率器件

产品覆盖650V-3300V SiC SBD和SiC MOSFET，采用第三代精细平面栅/第四代沟槽栅技术、体二极管续流，比导通电阻最低可到1.8mΩ·cm^2，可满足新能源汽车主驱、OBC、DC/DC、充电桩、新能源发电、测试电源、轨道交通等复杂、高可靠性应用工况需求。

双极器件



产品包括晶闸管、整流管、IGCT等，电压覆盖等级600V-8500V，可满足高压直流输电、机车牵引与传动、静态无功补偿、软启动等多个领域的应用需求。

株洲中车时代半导体有限公司
ZHUZHOU CRRC TIMES SEMICONDUCTOR CO.,LTD.
湖南省株洲市田心工业园
T：+86 731 2849 8268
http://ctsc.csrzic.com

中国中车 CRRC

阳光电源
SUNGROW

连接绿色使命
共筑持续价值

阳光电源股份有限公司
SUNGROW POWER SUPPLY CO.,LTD.
安徽省合肥市高新区习友路1699号 (230088)

销售热线：400 119 7799
www.sungrowpower.com
股票代码：300274

阳光电源官微　阳光 光储充官微　阳光 光储充小程序

AVANTEST 道测电子

道测电子，让测试更简单

南京道测电子有限公司创立于2018年2月，公司集销售、系统集成、定制服务、研发为一体，拥有经验丰富的研发和技术团队。公司成立至今，持续专注于通信与电子领域的研发创新系统集成方案致力成为电源、通信及微波射频领域专业供应商。

销售及代理产品包括但不限于：信号发生器、频谱分析仪、网络分析仪、示波器、直流电源、交流电源、参数分析仪、器件分析仪、微波功率计、频率计、噪声系数测试仪、EMI测试接收机、信号质量分析仪（高速误码仪）、USRP软件无线电设备、红外热成像设备、安规测试仪、数字万用表、LCR测试仪、电子负载、网络测试仪、网络损伤仪、环境实验箱、高低温柜等。

代理及合作品牌

思仪

优利德

恩智电源

坤恒顺维

固纬

中星联华

珞光USRP

科威尔大功率电源

股票代码：002484

致力于成为全球电容器行业领先者

Dedicated To Becoming A Global Leader In The Capacitor Industry

南通江海电容器股份有限公司
JIANGHAI CAPACITOR CO.,LTD.

地址: 江苏南通市平潮镇通扬南路79号
Add: No.79 South Tong Yang Road, Pingchao Town, Nantong, Jiangsu, P.R. China
电话/Tel: 0086-513-86726012/86726055/86726080/86571344
传真/Fax: 0086-513-86723859/86571812
邮箱/E-mail: jh@jianghai.com
邮编/Zip Code: 226361
官网/Web: www.jianghai.com

南通江海电容器股份有限公司
JIANGHAI CAPACITOR CO.,LTD.

工业级电力电子快速原型开发专家

南京瑞途优特信息科技有限公司（RTUNIT®）成立于2016年，是一家专注于电力电子与电机驱动领域的创新型科技企业，致力于成为全球领先的开源设备及解决方案供应商。作为国家认证的高新技术企业，公司始终坚持“自主研发、自主品牌、国产化”的发展理念，以创新驱动为核心，为客户提供高效、可靠的技术支持与产品服务。

公司深耕科研与教育领域，主要服务于高校、科研院所等高端客户群体，凭借深厚的技术积累与丰富的行业经验，已成功开发多款创新型产品，包括快速原型控制器、积木式电力电子功率模块，以及覆盖多种功率等级的驱动器和逆变器。这些产品以模块化设计、灵活扩展、高可靠性、高稳定性为特点，广泛应用于科研实验、技术开发及系统集成等领域。

瑞途优特高度重视技术研发与知识产权保护，目前已拥有多项发明专利，并持续推动技术成果的产业化落地。公司不仅提供标准化产品，更注重为客户量身定制系统化解决方案，助力其在电力电子与电机驱动领域实现高效研发与创新突破。

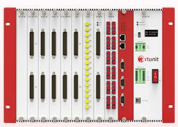
未来，南京瑞途优特将继续秉承“开放、协作、共赢”的理念，携手合作伙伴，推动国产电力电子技术的进步与行业生态的繁荣，为全球科研与工业发展贡献力量。

产品目录

实时数字控制器

RTU-BOX201

RTU-BOX205



RTU-BOX206

新品上市

RTU-BOX800

积木式功率模块

RTM-PEF4025IF-2.0
IGBT
400V-25A/全桥

RTM-PEF4025SF-2.0
SIC MOSFET
400V-25A/全桥

RTM-PEH8025IF-2.0
IGBT
800V-25A/半桥

RTM-PEH8025SF-2.0
SIC MOSFET
800V-25A/半桥

RTM-PEN8025IF-2.0
IGBT
800V-25A/I型

RTM-PET8025IF-2.0
IGBT
800V-25A/T型

辅助产品

三相逆变器 RTI-INV8040IR
IGBT/三相全桥

并网滤波器　RTF
L，F可定制

项目案例

电机控制算法验证平台

模块化多电平换流器

桌面新能源微网系统

创新型电力电子与运动控制教学实验平台

300+ 国内外高校的选择

5000+ 客户的选择

地址:南京市江宁区铺岗街381号德茂大厦5F

电话：025-52458092　　官网：www.rtunit.com

仿 真 和 验 证 领 域 的 合 作 伙 伴

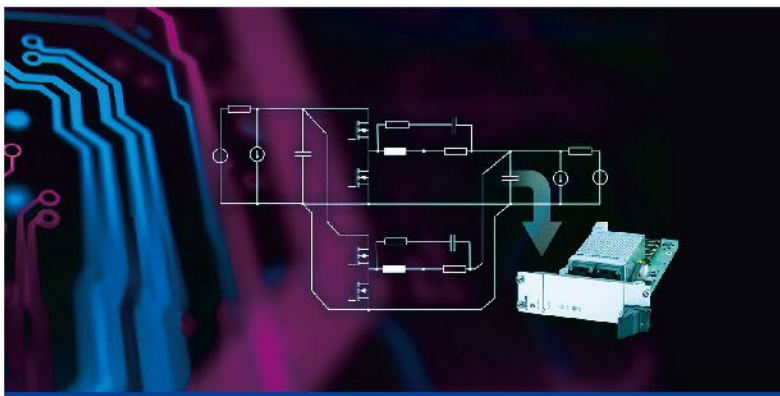
dSPACE
德 斯 拜 思

关于dSPACE

dSPACE 与全球领先的技术提供商合作，涵盖各种领域，致力于实现技术创新。利用我们最先进的硬件和软件仿真解决方案， 客户可以在仿真环境中快速高效地设计、实现和验证新开发的技术和应用程序。如今，dSPACE 是全球第一大原型开发和硬件 在环（HIL）解决方案提供商。dSPACE 有超过 35 年的企业历史，并已在全球交付了超过 50000 个系统。

XSG Power Electronics Systems (PES) 用于硬件在环（HIL）测试

它提供一个包含电力电子电路即可使用的模型库，让您能够对使用碳化硅（SiC）和氮化镓（GaN）等宽带隙半导体的拓扑结构进行测试。您可以使用 XSG PES 模型来仿真电力电子电路。这些模型具有高精度和高动态特性，有助于显著提高高动态电气系统及其控制器的开发和测试效率。



dSPACE Electrical Power Systems Simulation Package

是适用于 Simscape Electrical™ (Specialized Power Systems) 的仿真解决方案。该解决方案为 Simscape Electrical™ 中开发的电气模型增加了实时计算和仿真能力。

dSPACE HIL 测试 - 产品组合

MLBX II
Controller-level

SCALEXIO LabBox
ECU-Level

SCALEXIO (OTS) Rack
ECU/Domain-Level

SCALEXIO Turnkey
Multi-Domain

关注德斯拜思官微或登录 dSPACE.com

PEDG 2025

Diamond Sponsors

HUAWEI

Gold Sponsors

Chroma

艾罗能源 SOLAX POWER

南瑞继保 NR ELECTRIC

KeLiang 科梁

ITECH 全方位电源解决方案供应商

MITSUBISHI ELECTRIC Changes for the Better

中国中车 CRRC

阳光电源 SUNGROW

AVANTEST 普测电子

Jianghai

rtunit

dSPACE 德斯拜思