# 2022 4th INTERNATIONAL CONFERENCE ON SMART POWER & INTERNET ENERGY SYSTEMS

SPIES 2022

# 第四届智慧电力和互联网能源系统国际会议

VIRTUAL | 09-12 December 2022

# 2022 SPIES CONFERENCE PROGRAM

# 2022 4th International Conference on Smart Power & Internet Energy Systems

**December 9-12, 2022 | Beijing, China**

## "Towards a Net-Zero Carbon Future"

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# Welcome Message

On behalf of the Organizing Committee, it is my immense pleasure to welcome all eminent delegates, keynote speakers, sponsors, and industry delegates who have come from all over the world to join the 2022 4th International Conference on Smart Power & Internet Energy Systems (SPIES 2022).

The SPIES conference series is held annually to provide an interactive forum for presentation and discussion on Smart Power, Intelligent Energy Systems, and related fields. SPIES started in 2019 and was co-sponsored by Deakin University, Curtin University and University of Western Australia. It was successfully held in Deakin University, Geelong Campus during April 25-27, 2019. Due to COVID-19, SPIES 2020 was held virtually during September 15-18, 2020 and sponsored by Prince of Songkla University, Thailand. SPIES 2021 was sponsored by Shanghai University of Electric Power, China, and was successfully held in Shanghai during September 25-28, 2021.

SPIES 2022 was originally held offline in Beijing from October 23 to 25 but was postponed to December 9-12 because of the COVID situation in China. Unfortunately, the epidemic situation has got worse recently. Also, SPIES can't be postponed any longer because the authors are waiting for the publication of their papers. Therefore, we decided to hold the conference virtually. I know everyone is looking forward to the opportunity of a face-to-face meeting after three years' virtual discussion. I apologize for that we have to communicate online again for everyone's safety. This is beyond my expectation. I wish you can take care of your health, support each other and spend this difficult time together.

SPIES 2022 is co-sponsored by Tsinghua University and Shandong University, and technically supported by IEEE Industry Applications Society, IEEE Industrial Electronics Society, IEEE Power, and Energy Society. We would like to thank our sponsors Beijing National Research Center for Information Science and Technology, Qingdao Yunlu Advanced Materials Technology Co., Ltd., ModelingTech Energy Technology Co., Ltd., Xi'an ACTIONPOWER Electric Co., Ltd., WindSun Science & Technology Co., Ltd. and Shandong Hoteam Technology Group CO., LTD. for supporting this event. Many thanks also go to these four journals for their support on publication: IEEE Transactions on Industry Applications, CSEE Journal of Power and Energy Systems, Journal of Modern Power Systems and Clean Energy, and High Voltage.

We set up 18 technical Tracks and 2 Special Sessions in SPIES 2022. Thanks for the hard work of all track and special session chairs. After more than one year's preparation, we received more than 580 submissions from China, France, Australia, Singapore, Vietnam, the USA, New Zealand, Thailand, and other countries. More than 250 Technical Program Committee Members participated in the review process. Thanks for their great efforts and excellent work. Finally, 421 papers are accepted by SPIES 2022. Congratulations on your good work. Your efforts will make a successful SPIES.

SPIES 2022 has 4 plenary speeches, 12 keynote speeches, and 52 technical Sessions. We also organized two special forums: Women in Power Forum (Facing the challenges of Novel Power Systems-Inspiring more female engineers), and IEC SC8A Seminar (Seminar on Control Technology and Standardization for Renewable Energy Conversion). I hope all participants can enjoy the speeches and forums.

I hope SPIES 2022 can provide an international platform for the global power and energy experts from academia, industry, utilities, and service providers to exchange ideas and experiences on emerging and enabling technologies, and also offer great opportunities for all participants to establish academic relationships and to find global partners for the future cooperation.

Finally, I would extend my sincere gratitude to all delegates, and wish SPIES 2022 can get a complete success.

Conference General Chair
Hua Geng
Tsinghua University, China

# Conference Committees

## | Honorary Chairs

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# Guideline | 参会须知

## Platform: Zoom | 应用：Zoom

- For Users from mainland China please download: www.zoom.com.cn/download
- For General Users please download: https://zoom.us/support/download
- Zoom Help Center: https://support.zoom.us

## Time Zone | 时区

- China Standard Time (CST) UTC/GMT+08:00
- Please make sure that both the clock and the time zone on your computer are set to the correct China Time

## Device | 设备要求

- A computer with an internet connection (wired connection recommended)
- USB plug-in headset with a microphone (recommended for optimal audio quality)
- Webcam: built-in or USB plug-in

## Environment | 环境要求

- Quiet Environment
- Stable Internet Connection
- Proper lighting

## Sign In and Join | 登陆 Zoom 和加入会议

- Join a meeting without signing in: A Zoom account is not required if you join a meeting as a participant, but you cannot change the virtual background or edit the profile picture
- Sign in with a Zoom account: All the functions are available

## Voice Control Rules | 音频控制

- The host will mute all participants while entering the meeting
- Speakers can unmute microphone when it is his or her turn for presentation

## Conference Recording | 会议录制

- The whole conference will be recorded. We appreciate your proper behavior and appearance
- The recording will be used for the conference reports among the committee. It won't be distributed to or shared with anyone else, and it shall not be used for commercial or illegal purpose. It will only be recorded by the staff; the presenters are not allowed to record.

# Simple Program

## December 9 (Friday)

**Zoom Test | 线上测试**
**Time Zone: GMT+8**

| Time | | Speaker | | |
|---|---|---|---|---|
| | Zoom ID | Room 1: 82273564217 | Room 2: 88531611705 | Room 3: 87069632470 |
| 9:10-11:30 Morning Test | 9:10-9:20 | Test for Prof. Badrul Chowdhury | Test for Session 1 & 2 | Test for Session 3 & 4 |
| | 9:20-9:30 | Test for Prof. Innocent Kamwa | | |
| | 9:30-9:40 | Test for Prof. Kaushik Rajashekara | | |
| | 9:40-9:50 | Test for Prof. Yang Shi | Test for Session 5 & 6 | Test for Session 7 & 8 |
| | 9:50-10:00 | Test for Prof. Leila Parsa | | |
| | 10:00-10:10 | Test for Prof. Hua Geng | | |
| | 10:10-10:20 | Test for Prof. Rong Zeng | Test for Session 9 & 10 | Test for Session 11 & 12 |
| | 10:20-10:30 | Test for Prof. Chenghui Zhang | | |
| | 10:30-10:40 | Test for Prof. Shengwei Mei | | |
| | 10:40-10:50 | Test for Prof. Zhaohong Bie | Test for Session 13 & 14 | Test for Session 15 & 16 |
| | 10:50-11:00 | Test for Prof. Yusheng Xue | | |
| | 11:00-11:10 | Test for Prof. Xiaohong Guan | | |
| | 11:10- 11:20 | Test for Prof. Xinbo Ruan | Test for Session 17 & 18 | Test for Session 19 & 20 |
| | 11:20- 11:30 | Test for Prof. Jinjun Liu | | |

| | | | | |
|---|---|---|---|---|
| 13:30-17:20 Afternoon Test | Zoom ID | Room 1: 82273564217 | Room 2: 88531611705 | Room 3 ID: 87069632470 |
| | 13:30-13:40 | Test for Prof. Bin Li | Test for Session 21 & 22 | Test for Session 23 & 24 |
| | 13:40-13:50 | Test for Prof. Qiuye Sun | | |
| | 13:50-14:00 | Test for Prof. Hong Li | | |
| | 14:00-14:10 | Test for Assoc. Prof. Zedong Zheng | Test for Session 25 & 26 | Test for Session 27 & 28 |
| | 14:10-14:20 | Test for Assoc. Prof. Meng Huang | | |
| | 14:20-14:30 | Prof. Prof. Hongchun Shu | Test for Session 29 & 30 | Test for Session 31 & 32 |
| | 14:30-14:40 | Test for Prof. Vladimir Terzija | | |
| | 14:40-14:50 | Test for Prof. Gianfranco Chicco | | |
| | 14:50-15:20 | Test for Plenary & Keynote Session Hosts | Test for Session 33 & 34 | Test for Session 35 & 36 |
| | 15:20-15:50 | | Test for Session 37 & 38 | Test for Session 39 & 40 |
| | 15:50-16:20 | | Test for Session 41 & 42 | Test for Session 43 & 44 |
| | 16:20-16:50 | | Test for Session 45 & 46 | Test for Session 47 & 48 |
| | 16:50-17:20 | | Test for Session 49 & 50 | Test for Session 51 & 52 |
| | You can attend the test of other session if you cannot manage it in your given time. | | | |

# December 10 (Saturday)

**Time Zone: GMT+8**

| Morning Sessions: Opening Remarks, Plenary Speeches, Keynote Speeches, and Group Photo | | | |
|---|---|---|---|
| **Time** | **Sessions** | | **Room** |
| 8:30- 9:00 | Host | Prof. Hua Geng, Tsinghua University, China | Room 1 ID: 82273564217 |
| | Opening Remarks | Prof. Rong Zeng, Tsinghua University, China | |
| | | Prof. Chenghui Zhang, Shandong University, China | |
| | | Prof. Shengwei Mei, Tsinghua University, China | |
| | | Prof. Zhaohong Bie, Xi'an Jiaotong University, China | |
| 9:00-9:20 | Group Photo | | |
| 9:20-10:00 | Host | Prof. Chenghui Zhang, Shandong University, China | |
| | Plenary Speaker I | Prof. Yusheng Xue, NARI Group Corporation/State Grid Electric Power Research Institute, China | |
| 10:00-10:40 | Host | Prof. Shengwei Mei, Tsinghua University, China | |
| | Plenary Speaker II | Prof. Xiaohong Guan, Xi'an Jiaotong University, China | |
| 10:40-11:00 | Coffee Break | | |
| 11:00-11:30 | Host | Prof. Dong Yue, Nanjing University of Posts and Telecommunications, China | |
| | Keynote Speech I | Prof. Yang Shi, University of Victoria, Canada | |
| 11:30-12:00 | Host | Prof. Wuhua Li, Zhejiang University, China | |
| | Keynote Speech II | Prof. Xinbo Ruan, Nanjing University of Aeronautics and Astronautics (NUAA), China | |
| 12:00- 13:30 | Lunch time | | |
| **Afternoon Sessions** | | | |
| **Time** | **Sessions** | | **Room** |
| 13:30-14:00 | Host | Prof. Xiong Du, Chongqing University, China | Room 1 ID: 82273564217 |
| | Keynote Speech III | Prof. Jinjun Liu, Xi'an Jiaotong University, China | |

| | | | |
|---|---|---|---|
| 14:00-14:30 | Host | Prof. Guobin Song, Xi'an Jiaotong University, China | Room 1 ID: 82273564217 |
| | Keynote Speech IV | Prof. Bin Li, Tianjin University, China | |
| 14:30-15:00 | Host | Prof. S. M. Muyeen, Qatar University, Qatar | |
| | Keynote Speech V | Prof. Vladimir Terzija, Skoltech, Moscow, Russia | |
| 15:00-15:30 | Host | Assoc. Prof. Haiwang Zhong, Tsinghua University, China | |
| | Keynote Speech VI | Prof. Gianfranco Chicco, Politecnico di Torino, Italy | |
| 15:30-15:45 | Coffee Break | | |
| 15:45-17:45 | Session 1<br>Topic: Modeling and stability analysis of renewable energy system 1\| 新能源系统建模及稳定性分析1<br>(ModelingTech, SE0298, SE0364, SE0454, SE0347, SE0400, SE0118, SE0114) | | Room 1 ID: 82273564217 |
| | Session 2<br>Topic: Design and control for electrical machines and drives \| 新型磁材料与电机设计<br>(SE0344, SE0381, SE0395, SE0396, SE0475, SE0509, SE0246) | | Room 2 ID: 88531611705 |
| | Session 3<br>Topic: The application of real-time simulation for systems with high penetration of power electronic interfaced technologies \| 实时仿真在电力电子化系统的应用<br>(SE0448, SE0519, SE0135, SE0305, SE0375, SE0377, SE0408) | | Room 3 ID: 87069632470 |
| | Session 4<br>Topic: Coordinated Operation, Control and Cyber-physical Security of Smart Energy System \|智慧能源系统的协调运行、控制与信息物理安全<br>(SE0333, SE0331, SE0518, SE0383, SE0325) | | Room 4 ID: 83118449166 |
| | Session 5<br>Topic: Intelligent electrical equipment and reliability evaluation \|智能电气设备及可靠性评估<br>(SE371, SE0420, SE0139, SE0195, SE0340, SE0124, SE0361, SE0112) | | Room 5 ID: 815 9467 4058 |
| 15:45-16:30 | Session 6 (Poster)<br>Topic: Power electronic device and its reliability 1 \| 电力电子器件及可靠性1<br>(SE0084, SE0329, SE0142, SE0168, SE0178, SE0231, SE0238, SE0196, SE0472) | | Room 7 ID: 899 5509 2559 |
| 16:30-17:10 | Session 7 (Poster)<br>Topic: Topology and control of power converters 1\| 电力电子变换器拓扑与控制1<br>(SE0268, SE0297, SE0359, SE0018, SE0040, SE0071, SE0175, SE0497) | | Room 7 ID: 899 5509 2559 |
| 15:35-16:25 | Session 8 (Poster)<br>Topic: Modern power system: stability and control 1\| 新型电力系统稳定分析与控制1<br>(SE0334, SE0376, SE0287, SE0122, SE0506, SE0290, SE0091, SE0256, SE0295) | | Room 8 ID: 86964064559 |

| | | |
|---|---|---|
| 16:25-17:15 | Session 9 (Poster)<br>Topic: Fault diagnosis and protection of power system 1\| 电力系统故障检测及保护控制1<br>(SE0349, SE0366, SE0100, SE0206, SE0504, SE0232, SE0339, SE0358, SE0192, SE0160) | Room 8 ID: 86964064559 |
| 17:15-17:55 | Session 10 (Poster)<br>Topic: DC power transmission and DC power grid 1 \| 直流输电与直流电网1<br>(SE0345, SE0428, SE0042, SE0046, SE0059, SE0101, SE0117, SE0128) | Room 8 ID: 86964064559 |
| 14:30-18:00 | Women in Power Forum<br>Topic: Facing the Challenges of Novel Power Systems-Inspiring More Female Engineers | Room 6 ID: 86947297263 |
| Awarding Ceremony | | |
| 18:00-18:10 | Best Paper Award | Room 1 ID: 82273564217 |
| | Host: Prof. Jinjun Liu, Xi'an Jiaotong University, China | |
| 18:10-18:20 | Best Poster Award | |
| | Host: Prof. Hongchun Shu, Kunming University of Science and Technology, China | |
| 18:20-18:25 | Best Paper Award of WIP Forum | |
| | Host: Prof. Zhaohong Bie, Xi'an Jiaotong University, China | |
| 18:25-18:30 | Best Track Chair Award | |
| | Host: Prof. Hua Geng, Tsinghua University, China | |
| 18:30-18:35 | 2022 IEEE IAS Andrew W. Smith Outstanding Young Member Achievement Award | |
| | Host: Prof. Akshay Rathore, Singapore Institute of Technology (SIT), Singapore | |

# December 11 (Sunday)

**Time Zone: GMT+8**

| Plenary Speeches/Keynote Speeches/Sessions | | | |
|---|---|---|---|
| **Time** | **Sessions** | | **Room** |
| 8:30-9:10 | Host | Prof. Hua Geng, Tsinghua University, China | |
| | Plenary Speech III | Prof. Kaushik Rajashekara, University of Houston, USA | Room 1 ID: 82273564217 |
| 9:10-9:50 | Host | Prof. Fei Gao, University of Technology of Belfort-Montbeliard (UTBM), France | |
| | Plenary Speech IV | Prof. Leila Parsa, University of California Santa Cruz, Jack Baskin School of Engineering, USA | |
| 9:50-10:20 | Host | Prof. Tao Hong, University of North Carolina at Charlotte, USA | |
| | Keynote Speech VII | Prof. Badrul Chowdhury, University of North Carolina at Charlotte (UNCC), North Carolina, USA | |
| 10:20-10:50 | Host | Prof. Wenchuan Wu, Tsinghua University, China | |
| | Keynote Speech VIII | Prof. Innocent Kamwa, Laval University, Canada | |
| 10:50-11:00 | Coffee Break | | |
| 11:00-12:30 | Session 11<br>Topic: Energy storage technology and system 1 \| 新型电池设计与储能技术1<br>(SE0098, SE0182, SE0208, SE0253, SE0110-A, SE0119-A, SE0125-A) | | Room 6 ID: 86947297263 |
| | Session 12<br>Topic: Energy internet and cyber resilience \| 能源互联网与信息网络弹性<br>(SE0473, SE0299, SE0007, SE0435, SE0075, SE0017-A) | | Room 3 ID: 87069632470 |
| | Session 13<br>Topic: Forecasting of renewable energy and power demand 1 \| 负荷与可再生能源预测1<br>(SE0041, SE0258, SE0457, SE0507, SE0033, SE0488) | | Room 4 ID: 83118449166 |
| | Session 14<br>Topic: Forecasting of renewable energy and power demand 2 \| 负荷与可再生能源预测2<br>(SE0341, SE0020-A, SE0053, SE0109, SE0131, SE0249) | | Room 5 ID: 815 9467 4058 |
| | Session 15<br>Topic: High-voltage and insulation technology 1 \| 高电压与绝缘技术1<br>(SE0311, SE0414, SE0228, SE0476, SE0477, SE0480) | | Room 1 ID: 82273564217 |
| 11:00-11:55 | Session 16 (Poster)<br>Topic: Modeling and control of distributed energy sources 1 \| 分布式能源及优化控制1<br>(SE0261, SE0327, SE0335, SE0336, SE0430, SE0434, SE0461, SE0086, SE0039, SE0481, SE0326) | | Room 7 ID: 899 5509 2559 |

| | | | |
|---|---|---|---|
| 11:55-12:45 | Session 17 (Poster)<br>Topic: Electricity demand and load forecasting, energy internet and network security | 电力需求与负荷预测、能源互联网与网络安全<br>(SE0044, SE0197, SE0037, SE0318, SE0159, SE0280, SE0035, SE0521, SE0156, SE0162) | Room 7 ID: 899 5509 2559 |
| 11:00-12:00 | Session 18 (Poster)<br>Topic: Artificial intelligence in power systems 1 | 人工智能在电力系统的应用1<br>(SE0312, SE0120, SE0148, SE0186, SE0222, SE0415, SE0416, SE0423, SE0460, SE0493, SE0468, SE0082) | Room 8 ID: 86964064559 |
| 12:30- 13:30 | Lunch time | | |
| 13:30-14:00 | Host | Prof. Zhanbo Xu, Xi'an Jiaotong University, China | Room 1 ID: 82273564217 |
| | Keynote Speech IX | Prof. Qiuye Sun, Northeastern University, China | |
| 14:00-14:30 | Host | Prof. Alian Chen, Shandong University, China | |
| | Keynote Speech X | Prof. Hong Li, Beijing Jiaotong University, China | |
| 14:30-15:00 | Host | Prof. Wei Xu, Huazhong University of Science and Technology, China | |
| | Keynote Speech XI | Assoc. Prof. Zedong Zheng, of Tsinghua University, China | |
| 15:00-15:30 | Host | Prof. Xiaoqiang Guo, Yanshan University, China | |
| | Keynote Speech XII | Assoc. Prof. Meng Huang, Wuhan University, China | |
| 15:30-15:45 | Coffee Break | | |
| 15:45-18:00 | Session 19<br>Topic: Modeling and control of distributed energy sources 2 | 分布式能源及优化控制2<br>(ACTIONPOWER, SE0453, SE0189, SE0270, SE0271, SE0272, SE0273, SE0279, SE0300, SE0447, SE0483) | Room 6 ID: 86947297263 |
| | Session 20<br>Topic: Energy storage technology and system 2 | 新型电池设计与储能技术2<br>(SE0385, SE0021-A, SE0065, SE0085, SE0106-A, SE0116, SE0130-A, SE0132, SE0140, SE0233) | Room 3 ID: 87069632470 |
| | Session 21<br>Topic: Energy storage technology and system 3 | 新型电池设计与储能技术3<br>(SE0151, SE0174, SE0180, SE0484, SE0107-A, SE0485, SE0193, SE0060-A, SE0392, SE0432) | Room 4 ID: 83118449166 |
| | Session 22<br>Topic: Electricity demand and marketing | 电力需求与市场策略<br>(SE0161, SE0489, SE0330, SE0402, SE0019, SE0069, SE0508, SE0321, SE0181, SE0034) | Room 5 ID: 815 9467 4058 |

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|---|---|---|
| 15:45-18:15 | Session 23<br>Topic: Modern power system: stability and control 2 \| 新型电力系统稳定分析与控制2<br>(Hoteam, SE0286, SE0316, SE0387, SE0134, SE0214, SE0217, SE0252, SE0469, SE0502) | Room 1 ID: 82273564217 |
| 15:45-16:30 | Session 24 (Poster)<br>Topic: Modeling and stability analysis of renewable energy system 2\| 新能源系统建模及稳定性分析2<br>(SE0267, SE0328, SE0384, SE0393, SE0036, SE0185, SE0356, SE0257, SE0104) | Room 7 ID: 899 5509 2559 |
| 16:30-17:30 | Session 25 (Poster)<br>Topic: Energy storage technology and system 4 \| 新型电池设计与储能技术4<br>(SE0419, SE0503, SE0072, SE0080, SE0099, SE0220, SE0224, SE0234, SE0022-A, SE0445, SE0204, SE0097) | Room 7 ID: 899 5509 2559 |
| 17:30-18:25 | Session 26 (Poster)<br>Topic: Optimal management and control of smart grid 1 \| 智能电网优化管理与运行控制1<br>(SE0458, SE0373, SE0056, SE0173, SE0213, SE0516, SE0498, SE0242, SE0348, SE0216, SE0043) | Room 7 ID: 899 5509 2559 |
| 15:45-16:50 | Session 27 (Poster)<br>Topic: High-voltage and insulation technology 2\| 高电压与绝缘技术2<br>(SE0294, SE0314, SE0317, SE0078, SE0188, SE0221, SE0223, SE0230, SE0492, SE0465, SE0048, SE0293, SE0501) | Room 8 ID: 86964064559 |
| 16:50-17:50 | Session 28 (Poster)<br>Topic: Electrified transportation technology and applications 1 \| 电气化交通1<br>(SE0412, SE0450, SE0154, SE0229, SE0397, SE0512, SE0524, SE0308, SE0433, SE0382, SE0212, SE0444) | Room 8 ID: 86964064559 |
| 9:00-17:00 | Seminar on Control Technology and Standardization for Renewable Energy Conversion | Room 2 ID: 88531611705 |

# December 12 (Monday)

**Time Zone: GMT+8**

| Session 29-52 | | |
|---|---|---|
| **Time** | **Sessions** | **Room** |
| 8:30-10:30 | **Session 29**<br>**Topic: DC power transmission and DC power grid 2 \| 直流输电与直流电网2**<br>**(SE0439, SE0474, SE0137, SE0138, SE0247, SE0090, SE0511)** | **Room 2 ID: 88531611705** |
| | **Session 30**<br>**Topic: Optimization and control of cyber-physical energy system 1\| 信息物理能源系统优化与控制1**<br>**(SE0108, SE0076, SE0079, SE0149, SE0362, SE0306, SE0352, SE0449)** | **Room 3 ID: 87069632470** |
| | **Session 31**<br>**Topic: Power electronic device and its reliability 2 \| 电力电子器件及可靠性2**<br>**(SE0291, SE0363, SE0388, SE0490, SE0526, SE0070, SE0083, SE0205)** | **Room 4 ID: 83118449166** |
| | **Session 32**<br>**Topic: Fault diagnosis and protection of power system 2 \| 电力系统故障检测及保护控制2**<br>**(SE0227, SE0440, SE0455, SE0062, SE0077, SE0514, SE0436, SE0087)** | **Room 5 ID: 815 9467 4058** |
| | **Session 33**<br>**Topic: Optimal management and control of smart grid 2 \| 智能电网优化管理与运行控制2**<br>**(SE0431, SE0442, SE0443, SE0274, SE0463, SE0061, SE0094, SE0200)** | **Room 6 ID: 86947297263** |
| | **Session 34**<br>**Topic: Topology and control of power converters 2 \| 电力电子变换器拓扑与控制2**<br>**(SE0277, SE0462, SE0499, SE0505, SE0047, SE0157, SE0209)** | **Room 1 ID: 82273564217** |
| **10:30-10:45** | **Coffee Break** | |
| 10:45-12:30 | **Session 35**<br>**Topic: Electromagnetic compatibility (EMC) technology \| 电磁兼容**<br>**(SE0275, SE0368, SE0250, SE0284, SE0479, SE0055, SE0236, SE0515)** | **Room 2 ID: 88531611705** |
| | **Session 36**<br>**Topic: Electrified transportation technology and applications 2 \| 电气化交通2**<br>**(SE0304, SE0390, SE0350, SE0052, SE0369, SE0470, SE0176)** | **Room 3 ID: 87069632470** |
| | **Session 37**<br>**Topic: Optimal management and control of smart grid 3 \| 智能电网优化管理与运行控制3**<br>**(SE0245, SE0520, SE0102, SE0409, SE0150, SE0194, SE0179)** | **Room 4 ID: 83118449166** |
| 10:45-12:30 | **Session 38**<br>**Topic: High-voltage and insulation technology 3 \| 高电压与绝缘技术3**<br>**(SE0066, SE0089, SE0144, SE0164, SE0495, SE0031)** | **Room 5 ID: 815 9467 4058** |

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| | **Session 39**<br>**Topic: Energy storage technology and system 5 \| 新型电池设计与储能技术5**<br>**(SE0113-A, SE0404, SE0517, SE0482, SE0522, SE002)** | **Room 6 ID: 86947297263** |
| | **Session 40**<br>**Topic: Optimization and control of cyber-physical energy system 2 \| 信息物理能源系统优化与控制2**<br>**(SE0266, SE0486, SE0418, SE0525, SE0003, SE0074)** | **Room 1 ID: 82273564217** |
| **12:30- 13:30** | **Lunch time** | |
| **13:30-15:30** | **Session 41**<br>**Topic: Modern power system: stability and control 3 \| 新型电力系统稳定分析与控制3**<br>**(SE0262, SE0015, SE0351, SE0354, SE0067, SE0129, SE0421)** | **Room 2 ID: 88531611705** |
| | **Session 42**<br>**Topic: High-voltage and insulation technology 4\| 高电压与绝缘技术4**<br>**(SE0024, SE0163, SE0183, SE0241, SE0244, SE0513, SE0030)** | **Room 3 ID: 87069632470** |
| | **Session 43**<br>**Topic: Topology and control of power converters 3 \| 电力电子变换器拓扑与控制3**<br>**(SE0313, SE0332, SE0370, SE0410, SE0478, SE0218, SE0255, SE0141)** | **Room 4 ID: 83118449166** |
| | **Session 44**<br>**Topic: Modeling and control of distributed energy sources 3 \| 分布式能源及优化控制3**<br>**(SE0288, SE0319, SE0379, SE0417, SE0184, SE0187, SE0211, SE0451, SE0510)** | **Room 5 ID: 815 9467 4058** |
| | **Session 45**<br>**Topic: Topology and control of power converters 4 \| 电力电子变换器拓扑与控制4**<br>**(SE0276, SE0471, SE0487, SE0045, SE0169, SE0057, SE0437, SE0438)** | **Room 6 ID: 86947297263** |
| | **Session 46**<br>**Topic: Fault diagnosis and protection of power system 3 \| 电力系统故障检测及保护控制3**<br>**(SE0285, SE0338, SE0527, SE0123, SE0167, SE0191, SE0201, SE0226)** | **Room 1 ID: 82273564217** |
| **15:30-15:45** | **Coffee Break** | |
| **15:45-18:00** | **Session 47**<br>**Topic: Artificial intelligence in power systems 2 \| 人工智能在电力系统的应用2**<br>**(SE0289, SE0309, SE0353, SE0411, SE0088, SE0121, SE0152, SE0422, SE0467)** | **Room 2 ID: 88531611705** |
| | **Session 48**<br>**Topic: Topology and control of power converters 5 \| 电力电子变换器拓扑与控制5**<br>**(SE0259, SE0403, SE0459, SE0494, SE0133, SE0260, SE0365, SE0456, SE0126, SE0324)** | **Room 3 ID: 87069632470** |
| **15:45-18:00** | **Session 49**<br>**Topic: Modeling and control of distributed energy sources 4 \| 分布式能源及优化控制4** | **Room 4 ID: 83118449166** |

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|---|---|---|
| | (SE0496, SE0032, SE0095, SE0198, SE0500, SE0357, SE0005, SE0355, SE0012) | |
| | Session 50<br>Topic: Power electronic device and its reliability 3 | 电力电子器件及可靠性3<br>(SE0278, SE0346, SE0103, SE0425, SE0426, SE0081, SE0239, SE0254, SE0251, SE0096) | Room 5 ID: 815 9467 4058 |
| | Session 51<br>Topic: Optimal management and control of smart grid 4 | 智能电网优化管理与运行控制4<br>(SE0282, SE0283, SE0292, SE0302, SE0303, SE0307, SE0315, SE0367, SE0158) | Room 6 ID: 86947297263 |
| | Session 52<br>Topic: Optimal management and control of smart grid 5 | 智能电网优化管理与运行控制5<br>(SE0049, SE0068, SE0143, SE0145, SE0424, SE0429) | Room 1 ID: 82273564217 |

# Detailed Program

## December 10 (Saturday)

**Opening Remarks**

**Time** 8:30-9:00, December 10
**Room** Zoom ID: 82273564217

### Prof. Rong Zeng

### Vice President of Tsinghua University

**Tsinghua University, China**

Prof. Rong Zeng is now a full professor of Department of Electrical Engineering of Tsinghua University, Vice President of Tsinghua University, Director of State Key Laboratory of Power System and Power Generation Equipment Control and Simulation. New Century Excellent Talents of the Ministry of Education (2005), winner of the National Fund for Distinguished Young Scholars (2013). In July 1995, he graduated from the Department of Electrical Engineering, Tsinghua University, with a bachelor's degree in engineering and economics; in July 1999, he graduated with an excellent doctorate from Tsinghua University, and stayed at the school to teach; in 2006, he was an associate professor of Tsinghua University. He won the Mao Yisheng Beijing Youth Science and Technology Award in 2012, the Capital Labor Medal in 2015, the IEEE EMC Technology Achievement Award in 2018, and the China Electric Power Science and Technology Outstanding Contribution Award in 2020. He has visited the Department of Materials Science of Stanford University, the Department of Mathematics of the University of Singapore, and the Department of Electrical Engineering of the University of Hong Kong for many times.

Currently, he is mainly engaged in the teaching and research of power electronic devices and key equipment of DC power grid, electromagnetic transients of AC and DC power systems and their protection. He has won 2 second prizes of the National Science and Technology Progress Award, and more than 10 provincial and ministerial science and technology awards. He has published more than 300 papers, including Appl. Phys. Lett., IEEE Trans. on PWRD, IEEE Trans. on PE, IEEE Trans. More than 100 articles are included in on DEI, etc. He has served as the chairman of international academic conferences for many times, and co-founded the English journal IET "High Voltage" and served as the deputy editor.

**Opening Remarks**

| | |
|---|---|
| **Time** | **8:30-9:00, December 10** |
| **Room** | **Zoom ID: 82273564217** |

# Prof. Chenghui Zhang

## Conference Honorary Chair

**Shandong University, China**

Chenghui Zhang received the Ph.D. degree in control theory and operation research from Shandong University, China, in 2001. He is currently a Professor and the Dean of the School of Control Science and Engineering, Shandong University, an IEEE Fellow, and a CAA Fellow. He is also a Distinguished Professor of Cheung Kong Scholars awarded by China Ministry of Education and a Taishan-Scholar Climbing Plan Expert (the most competitive talent plan supporting top industry and academic experts in Shandong province). He is the Director of the National & Local Joint Engineering Research Center of Renewable Energy and High-efficient Energy Conservation Technology, and the Director of the Ministry of Education Engineering Research Center of Power Electronic Technology and Equipment for Energy Saving.

Prof. Zhang's research interests include power electronics, renewable energy generation, energy storage battery management, power system control and optimization. Many of his research outcomes have been commercialized and widely used in industry. He was the recipient of the Science and Technology Innovation Award of Ho Leung Ho Lee Foundation. He was also the recipient of two National Science and Technology Progress Awards, two National Teaching Awards, and more than 7 provincial and ministerial-level Science and Technology Awards. He is a member of the 8th Science and Technology Committee in the Information Division of the Ministry of Education, a member of the Teaching Committee of Higher Education of Ministry of Education of China. He is the Director of CAA Renewable Energy and Energy Storage System Control Committee, the Deputy Director of CAA Electrical Automation Committee, the Executive Director of China Electrotechnical Society, and the Executive Director of China Power Supply Society.

**Opening Remarks**

**Time** 8:30-9:00, December 10
**Room** Zoom ID: 82273564217

## Prof. Shengwei Mei

## Conference Honorary Chair

**Tsinghua University, China**

Shengwei Mei, Professor of Tsinghua University, Vice President of Qinghai University, Changjiang Scholars Distinguished Professor, Winner of National Science Fund for Distinguished Young Scholars, IEEE Fellow, IET Fellow, CSEE Fellow, CAA Fellow. Researches mainly focus on the security control and efficient utilization of energy-power systems, including robust control of power systems, disaster prevention of large-scale grid, new energy power systems and large-scale energy storage.

He proposed the principle of nonlinear robust control design for power systems, and solved two major problems which have plagued the power control industry for decades. He established the theory of self-organized criticality of power systems, revealed the propagation mechanism of cascading failures and efficiently identified weaknesses. He initiated a new direction of engineering game theory and developed the advanced adiabatic compressed air energy storage system, which provided new theories and technologies for the efficient consumption of renewable energy. He has published 476 journal papers, 10 books and 118 authorized patents. He has won 1 second prize of the National Natural Science Award, 1 second prizes of the National Science and Technology Progress Award and 12 first prizes of Provincial and Ministerial Science and Technology Award.

**Opening Remarks**

**Time** 8:30-9:00, December 10
**Room** Zoom ID: 82273564217

# Prof. Zhaohong Bie

## Conference General Co-Chair

**Xi'an Jiaotong University, China**

Prof. Zhaohong Bie received B.S. and M.S. degrees from the Electric Power Department of Shandong University, Jinan, China in 1992 and 1994, respectively. She received the Ph. D. degree in Electric Engineering from Xi'an Jiaotong University, Xi'an, China in 1998. Currently, she is a Professor in the School of Electrical Engineering, Xi'an Jiaotong University, and a member of National Key Talent Project of China. She is also the vice president of Xi'an Jiaotong University and the president of IEEE PES China Chapter. Since 2015, she has been the Director of Smart Grid Key Laboratory of Shaanxi Province. She is the Convenor of IEC TC8/WG7 on General Planning, Design, Operation and Control of Microgrids which is the first international standard of microgrids. Prof. Bie is an IEEE Fellow.

Her main interests and research fields are in the general area of smart grid and renewable energy. She has worked extensively on power system reliability evaluation, grid integration of renewable energy resources, and transmission system planning & operation. Her current researches focus on resilience of the smart distribution system, risk assessment of the integrated energy system, and planning, operation and trading of energy interconnection.

She has authored over 100 published journal articles, and the total cites has reached 2000. She is the principal investigator of more than 10 national S&T projects. Since 2016, she has been the principals of two significant national projects: National Natural Science Foundation of China (51637008) and National Key Research and Development Program of China (2016YFB0901900). More information can be found from her homepage http://gr.xjtu.edu.cn/web/zhbie.

**Host**
**主持人**

**Time** 8:30-12:00, December 10
**Room** Zoom ID: 82273564217

## Prof. Hua Geng

## Conference General Chair

**Tsinghua University, China**

Hua Geng received the B.S. degree in electrical engineering from Huazhong University of Science and Technology, Wuhan, China, in 2003 and the Ph.D. degree in control theory and application from Tsinghua University, Beijing, China, in 2008. From 2008 to 2010, he was a Postdoctoral Research Fellow with the Department of Electrical and Computer Engineering, Ryerson University, Toronto, ON, Canada. He joined Tsinghua University in June 2010 and is currently a full professor. He is also a Distinguished Professor of Changjiang Scholars, China Ministry of Education.

His current research interests include advanced control on power electronics and renewable energy conversion systems. He has authored more than 170 technical publications and holds more than 30 issued Chinese/US patents. He is the editors of IEEE Trans. on Energy Conversion and IEEE Trans. on Sustainable Energy, associate editors of IEEE Trans. on Industry Applications, IET Renewable Power Generation, Control Engineering Practice. He is an IEEE Fellow and an IET Fellow, convener of the modeling working group in IEC SC 8A. He has won 1 second prize of the National Science and Technology Progress Award and 3 first prizes of Provincial and Ministerial Science and Technology Award.

# Plenary Speaker I

**Host 主持人** Prof. Chenghui Zhang, Shandong University, China

**Time** 9:20-10:00, December 10

**Room** Zoom ID: 82273564217

## Prof. Yusheng Xue

**NARI Group Corporation/State Grid Electric Power Research Institute, China**

Graduated from Shandong University, China in 1963, received a PhD degree in 1987 from the University of Liege, Belgium. He has been an elected academician of the Chinese Academy of Engineering since 1995. He is now the Honorary President of State Grid Electric Power Research Institute (SGEPRI or NARI), China. He is the Editor-in-Chief of Automation of Electric Power System (in Chinese, EI indexed) and that of Journal of Modern Power Systems and Clean Energy (in English, SCI indexed).

### Speech Contents

### Trajectory Dynamics Based Holistic-Reduction Thinking

**Abstract:** As the challenges of energy crisis, climate change and social development intensify, power systems are faced with huge uncertainties on large-scale renewable energy generation, strict environmental constraints, market competition, social participation, and cyber risks. To meet these challenges, the targeted physical system must be extended from the power grid to the whole energy chain including the upstream (primary energy) and downstream (end-user energy), while extending horizontally to interactions with the natural environment (emissions and natural disasters), market economy and other social behaviors. This presentation introduces the concept of Cyber-Physical-Social-System in Energy (CPSS in Energy, or CPSSE). CPSSE promotes the deep interaction of generation-grid-load-storage, optimizes the development and operation of the entire energy chain, and involves multi-dimensional coordinative optimization. Studying and running this typically complex system is undoubtedly a huge challenge.

Holism and reductionism are the two main views of human cognition of complex things. Holism correctly pointed out the essential loopholes introduced by reductionism in its process of decoupling and linearization, however it cannot solve the problem of quantitative analysis of nonlinear systems either, moreover the difficulties are very serious on cross-domain and dimensionality disasters. Thus, holism can only analyze complex systems in qualitative and empirical ways.

Systems science proposed in 1956 recognized that two epistemology must be coordinated to reveal the mechanism of emergince phenomena, which is the phenomena that can be seen in entire nonlinear systems but not in the relevant local systems. However, systems science does not give a concrete idea of how to merge the two, which prevents it from applications.

The "trajectory dynamics" proposed by the presenter explores the methodology of two-way fusion between holism and reductionism. Its key points include: (1) Modeling of related multi-domain links; (2) Through a ORAL sandbox deduction platform that can support causal models, multi-agent models, and real human participation, evolutionary information of the entire system is acquired and stored in the trajectory; (3) With theoretical research on specific problems, the dynamic behavior of a high-dimensional overall system is

defined as the aggregation of a series of two-dimensional behavior patterns, and the corresponding reversible linear transformation matrix is established, so that the information entropy is unchanged after the transformation. The overall trajectory is rigorously mapped or projected as phase plane trajectories of a set of two-dimensional imaging system, each imaging system reflects one of the dynamic patterns of the overall system behavior; (4) Using segmented linearization technology, the classical reductionist method is extended to the time-varying nonlinear system, and the time series of the feature indicators of each behavior pattern are extracted from these phase plane trajectories to describe the characteristics of the subsystem; (5) Aggregate the set of feature indicator sequence of each subsystem, jointly characterize the dynamic behavior of the overall system, and analyze the overall mechanism of problems in specific fields, so as to achieve the entropy-preserving fusion of holism and reductionism.

Through practical applications in different complex systems, including the Lorenz chaos, power system stability, broadband oscillations, and optimization of both target and paths for carbon emissions and carbon neutrality, this presentation demonstrates how the trajectory dynamics can be applied to rigorously integrate both the global view of holism, and the mechanism view of reductionism. Without losing or distorting any information on the complete trajectory, the deep integration of holism and reductionism is realized, and the concept of "linear local reduction" is sublimated to the level of "nonlinear integral reduction", also a bridge was built between the natural and social sciences.

# Plenary Speaker II

**Host 主持人** Prof. Shengwei Mei, Tsinghua University, China

**Time** 10:00-10:40, December 10

**Room** Zoom ID: 82273564217

## Prof. Xiaohong Guan

**Xi'an Jiaotong University, China**

Professor Xiaohong Guan received his B.S. and M.S. degrees in Control Engineering from Tsinghua University, Beijing, China, in 1982 and 1985, respectively, and his Ph.D. degree in Electrical and Systems Engineering from the University of Connecticut in 1993. He was a senior consulting engineer with Pacific Gas and Electric from 1993 to 1995. He visited the Division of Engineering and Applied Science, Harvard University 1999-2000. Since 1995 he has been with the Systems Engineering Institute at Xian Jiaotong University, Xian, China, and was appointed as the Cheung Kong Professor of Systems Engineering in 1999, and Dean of Faculty of Electronic and Information Engineering since 2008. From 2001 he has also been with the Center for Intelligent and Networked Systems, Tsinghua University, Beijing, China, and severed the Head of Department of Automation, Tsinghua University, 2003-2008.

Professor Guan is a member of Chinese Academy of Science and IEEE Fellow. His research interests include economics and security of networked systems, optimization based planning and scheduling of electrical power and energy systems, manufacturing systems, etc., and cyber-physical systems including smart grid, etc.

### Speech Contents

### Zero-Carbon Intelligent Energy Systems and Energy Revolution

**Abstract:** Carbon emission from power and energy systems poses a huge challenge on the efforts to contain the global climate change. Utilization of new renewable energy such as wind and solar is inevitable. Since new renewable energy sources are highly uncertain, and current power systems worldwide need realtime supply-demand balance, energy storage technology is the key for fully utilization of new renewable energy sources.

The speech focuses on the new results on zero-carbon intelligent energy system that will support the national strategy on the "carbon peak" and the "carbon neutralization" as the key technology. Production, storage and transportation, and utilization of hydrogen as a main secondary energy source are introduced. It is shown that with the nontraditional energy storage technology the hydrogen enabled zero-carbon intelligent energy system provides an ideal infrastructure for energy supply and consumption without carbon emission and pollution, and would lead to the energy revolution towards resolving the global warming issue. The first hydrogen enabled zero-carbon intelligent energy system has been built to supply green energy for the athlete campus, the 5G base station and the datacenter.

# Keynote Speaker I

| Host 主持人 | Prof. Dong Yue<br>Nanjing University of Posts and Telecommunications, China | Time | 11:00-11:30, December 10 |
|---|---|---|---|
| | | Room | Zoom ID: 82273564217 |

## Prof. Yang Shi

### University of Victoria, Canada

Yang SHI received his B.Sc. and Ph.D. degrees in mechanical engineering and automatic control from Northwestern Polytechnical University, Xi'an, China, in 1994 and 1998, respectively, and the Ph.D. degree in electrical and computer engineering from the University of Alberta, Edmonton, AB, Canada, in 2005. From 2005 to 2009, he was an Assistant Professor and Associate Professor in the Department of Mechanical Engineering, University of Saskatchewan, Saskatoon, SK, Canada. In 2009, he joined the University of Victoria, and now he is a Professor in the Department of Mechanical Engineering, University of Victoria, Victoria, BC, Canada. His current research interests include networked and distributed systems, model predictive control (MPC), cyber-physical systems (CPS), robotics and mechatronics, navigation and control of autonomous systems (AUV and UAV), and energy system applications.

Dr. Shi received the University of Saskatchewan Student Union Teaching Excellence Award in 2007, and the Faculty of Engineering Teaching Excellence Award in 2012 at the University of Victoria (UVic). He is the recipient of the JSPS Invitation Fellowship (short-term) in 2013, the UVic Craigdarroch Silver Medal for Excellence in Research in 2015, the 2017 IEEE Transactions on Fuzzy Systems Outstanding Paper Award, the Humboldt Research Fellowship for Experienced Researchers in 2018. He is Vice President of IES, Chair of IEEE IES Technical Committee on Industrial Cyber-Physical Systems, and was on the IES Fellow Evaluation Committee during 2017-2019. Currently, he is Co-Editor-in-Chief for IEEE Transactions on Industrial Electronics; he also serves as Associate Editor for Automatica, IEEE Transactions on Automatic Control, IEEE Transactions on Cybernetics, etc. He is General Chair of the 2019 International Symposium on Industrial Electronics (ISIE) and the 2021 International Conference on Industrial Cyber-Physical Systems (ICPS).

He is a Fellow of IEEE, ASME, CSME, and Engineering Institute of Canada (EIC), and a registered Professional Engineer in British Columbia, Canada.

## Speech Contents

### Model Predictive Control for Cyber-Physical Energy Systems

**Abstract:** Cyber-physical systems (CPS) can be described as smart systems that encompass computational (i.e., hardware and software) and physical components, seamlessly integrated and closely interacting to sense and manipulate the changing state of the real world. Modern smart grid, as a typical CPS, allows plug-in ORAL electric vehicles (PHEVs) to be a promising candidate for grid services. Model predictive control (MPC) is a promising paradigm for high-performance and cost-effective control of complex CPS. In this talk, following the CPS design approach, a novel framework for the local aggregator to estimate the charging status and solve for the charging control signals for PHEVs will be presented. The physical battery charging is executed by charging stalls, where charging information is processed in the embedded system and only the generated index information is transmitted to the aggregator via Internet. An aggregation model is developed for the entire cyberspace to inherently guarantee heterogeneous charging requirements. Furthermore, a nonlinear MPC (NMPC) scheme is introduced for achieving the overnight valley-filling service. Finally, some existing challenges and future research directions will be discussed.

# Keynote Speaker II

**Host 主持人** Prof. Wuhua Li, Zhejiang University, China

**Time** 11:30-12:00, December 10

**Room** Zoom ID: 82273564217

## Prof. Xinbo Ruan

**Nanjing University of Aeronautics and Astronautics (NUAA), China**

Xinbo Ruan received the B.S. and Ph.D. degrees in electrical engineering from Nanjing University of Aeronautics and Astronautics (NUAA), Nanjing, China, in 1991 and 1996, respectively.

In 1996, he joined the Faculty of Electrical Engineering Teaching and Research Division, NUAA, where he became a Professor in the College of Automation Engineering in 2002 and has been engaged in teaching and research in the field of power electronics. From August to October 2007, he was a Research Fellow in the Department of Electronic and Information Engineering, Hong Kong Polytechnic University, Hong Kong, China. From March 2008 to Sep. 2011, he was also with the School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, China. He is the author or co-author of 12 books and more than 300 technical papers published in journals and conferences. His main research interests include soft-switching dc-dc converters, soft-switching inverters, power factor correction converters, modeling the converters, power electronics system integration and renewable energy generation system.

Prof. Ruan was a recipient of the Delta Scholarship by the Delta Environment and Education Fund in 2003 and was a recipient of the Special Appointed Professor of the Chang Jiang Scholars Program by the Ministry of Education, China, in 2007. From 2005 to 2013, and since 2017 again, he serves as a Vice President of the China Power Supply Society. From 2014 to 2016, he served as a Vice Chair of the Technical Committee on Renewable Energy Systems within the IEEE Industrial Electronics Society. Currently, he serves as an Editor for IEEE Journal of Emerging and Selected Topics on Power Electronics and an Associate Editor for IEEE Transactions on Industrial Electronics, IEEE Transactions on Power Electronics, IEEE Open Journal of Industrial Electronics Society, and IEEE Transactions on Circuits and Systems – II: Express Briefs. He was the General Chair of IPEMC-ECCE Asia 2020 and the General Secretary of IPEMC-ECCE Asia 2009, a Technical Program Committee Chair of the IEEE 7th Annual Energy Conversion Congress and Exposition (ECCE2015), and a Tutorial Committee Chair of the IEEE 12th Annual Energy Conversion Congress and Exposition (ECCE2020). He is an IEEE Fellow.

## Speech Contents

### Second Harmonic Current Reduction Techniques for Two-Stage Single-Phase Power Converters

**Abstract:** In the two-stage single-phase power factor correction ac–dc converter, the input power pulsates at twice the line frequency; while in the two-stage single-phase dc–ac inverter, the output power pulsates at twice the output frequency. Meanwhile, in the two kinds of single-phase converters, the dc port holds constant power. Consequently, the pulsating power will result in second harmonic current (SHC) in the ac–dc converter and dc–ac inverter. The SHC will propagate into the dc-dc converter, the input dc voltage source or the dc load, leading to the degradation of the conversion efficiency of the dc-dc

converter, the reduction of the energy conversion efficiency of the input dc voltage source, and shortened lifetime of the input dc voltage source or the dc load. To overcome these drawbacks, it is of necessity to suppress the SHC in the dc-dc converter, the dc voltage source or the dc load.

This report will firstly reveal the generating and propagating mechanism of the SHC in the two-stage single-phase converters. Then, a series of control schemes to suppress the SHC in the dc-dc converter while improving the dynamic response of the system are proposed. Besides, the electrolytic capacitor-less SHC compensator will also be presented, with which the undesired electrolytic capacitor can be removed so as to prolong the lifetime of the overall system.

# Keynote Speaker III

**Host 主持人** Prof. Xiong Du, Chongqing University, China

**Time** 13:30-14:00, December 10

**Room** Zoom ID: 82273564217

## Prof. Jinjun Liu

**Xi'an Jiaotong University, China**

Jinjun Liu (M'97–SM'10–Fellow'19) received the B.S. and Ph.D. degrees in electrical engineering from Xi'an Jiaotong University (XJTU), Xi'an, China, in 1992 and 1997, respectively.

He then joined the XJTU Electrical Engineering School as a faculty. From late 1999 to early 2002, he was with the Center for Power Electronics Systems, Virginia Polytechnic Institute and State University, Blacksburg, VA, USA, as a Visiting Scholar. In late 2002, he was promoted to a Full Professor and then the Head of the Power Electronics and Renewable Energy Center at XJTU, which now comprises more than 20 faculty members and over 200 graduate students and carries one of the leading power electronics programs in China. From 2005 to early 2010, he served as an Associate Dean of Electrical Engineering School at XJTU, and from 2009 to early 2015, the Dean for Undergraduate Education of XJTU. He is currently a XJTU Distinguished Professor of Power Electronics. He coauthored 3 books (including one textbook), published over 500 technical papers in peer-reviewed journals and conference proceedings, holds 70 invention patents (China/US/EU), and delivered for many times plenary keynote speeches and tutorials at IEEE conferences or China national conferences. His research interests include modeling, control, and design methods for power converters and electronified power systems, power quality control and utility applications of power electronics, and micro-grids for sustainable energy and distributed generation.

Dr. Liu received for many times governmental awards at national level or provincial/ministerial level for scientific research/teaching achievements. He also received the 2006 Delta Scholar Award, the 2014 Chang Jiang Scholar Award, the 2014 Outstanding Sci-Tech Worker of the Nation Award, the 2016 State Council Special Subsidy Award, the IEEE Transactions on Power Electronics 2016 and 2021 Prize Paper Awards, the Nomination Award for the Grand Prize of 2020 Bao Steel Outstanding Teacher Award, and the 2022 Fok Ying Tung Education and Teaching Award. He served as the IEEE Power Electronics Society Region 10 Liaison and then China Liaison for 10 years, an Associate Editor for the IEEE TRANSACTIONS ON POWER ELECTRONICS since 2006, 2015-2019 Executive Vice President and 2020-2021 Vice President of IEEE PELS. He was on the Board of China Electrotechnical Society 2012-2020 and was elected the Vice President in 2013 and the Secretary General in 2018 of the CES Power Electronics Society. He was the Vice President for International Affairs, China Power Supply Society (CPSS) from 2013 to 2021, and since 2016, the inaugural Editor-in-Chief of CPSS Transactions on Power Electronics and Applications. He was elected the President of CPSS in Nov. 2021. Since 2013, he has been serving as the Vice Chair of the Chinese National Steering Committee for College Electric Power Engineering Programs.

**Speech Contents**

# Autonomous Control of Distributed Energy Sources and Microgrids for Future Power Systems

**Abstract:** The coordinative control of distributed energy source converters and microgrids for future power systems is to ensure the system voltage to be within a nominal magnitude/frequency range and adequate output power sharing among all these energy sources, and at the same time to guarantee fast and smooth transfer of the microgrid operation between islanded mode and grid-connected mode. This is very often required to be realized through autonomous control where each source converter or the transfer switch is controlled by its own without getting or sensing any information from others or a center controller so that a higher reliability and an easy-to-implement plug-and-play feature could be achieved. At the distributed converters level there are two types of autonomous control that have been developed so far, i.e. master-slave control and droop control. The basic operation principles of both will be introduced with DC bus power grids as examples, and with droop control being focused, through detailed illustrations based on the simplest system structure of 2 paralleled source converters and one common load. These principles will then be extended to AC bus power systems, where droop control is executed in two channels: active power and reactive power. Several major technical issues that need to be dealt with in high-performance droop control will then be identified and some of them will be discussed extensively with possible solutions. At microgrid level, the major issues to solve in achieving autonomous transfer control are also clarified. The recent research results at Xi'an Jiaotong University to tackle these issues at both distributed converters level and microgrid level will be presented, and the major stare-of-arts methods and techniques will also be summarized for comparison. A new concept of flexible transfer converter is proposed to replace the traditional transfer switch and enable fully autonomous transfer control for microgrid.

# Keynote Speaker IV

**Host 主持人** Prof. Guobing Song
Xi'an Jiaotong University, China

**Time** 14:00-14:30, December 10
**Room** Zoom ID: 82273564217

## Prof. Bin Li

**Tianjin University, China**

Bin Li is professor and executive vice dean of the graduate school of Tianjin University, China. He obtained the B.Sc, M.Sc and Ph.D degrees in electrical engineering from Tianjin University in 1999, 2002 and 2005 respectively. And then he joined Tianjin University as an associate professor in 2006. In 2006, he was academic visitor of the University of Manchester, U.K. From 2008 to 2009, he worked in the design and application of protection relays and phasor measurement unit as a BOND engineer, in AREVA Company U.K. He has been engaged in the research of smart grid protection and control. He has published 8 books as an author or co-author. Besides, He has more than 50 invention patents and published more than 90 academic international journal papers. He is Elsevier Highly Cited Chinese Researchers and awarded the National Science Fund for Distinguished Young Scholars. He serves as Technical Committee Co-Chairs of some international conferences. He is an Editor for International Journal of Green Energy, Protection and Control of Modern Power Systems, Energy and AI, etc. Currently he is an investigator of some on-going research projects in this area supported by National Natural Science Foundation of China and the industry.

## Speech Contents

### Key Techniques of Transmission System for Offshore Wind Power

**Abstract:** The development and utilization of offshore wind energy resources is the critical path for energy structure reformation. With saturation development of the near offshore wind energy resources, large-scale deep-sea offshore wind farms have been becoming significant trends in recent years.

This presentation analyzes the influencing factors of wind power, and studies the wind power prediction method based on convolutional neural network. In the aspect of wind power transmission, the advantages and disadvantages of AC power frequency, current low frequency and DC transmission are compared and analyzed, and the key technical difficulties of wind power transmission through flexible DC transmission system are analyzed.

# Keynote Speaker V

**Host 主持人** Prof. S. M. Muyeen, Qatar University, Qatar

**Time** 14:30-15:00, December 10

**Room** Zoom ID: 82273564217

## Prof. Vladimir Terzija

**Skoltech, Moscow, Russia**

Vladimir Terzija received the Dipl-Ing., M.Sc., and Ph.D. degrees in electrical engineering from the University of Belgrade, Belgrade, Serbia. He is a Full Professor and a Head of Laboratory of Modern Energy Systems at Skoltech, Moscow, Russian Federation. He is also a Distinguished Professor at the Shandong University, Jinan, China. In the past, he has been with the University of Belgrade (Serbia), ABB (Germany) and The University of Manchester (UK). His research interests include smart grid applications; WAMPAC; power system protection; transient processes; data analytics and digital signal processing applications in power systems. Prof. Terzija is Editor in Chief of the International Journal of Electrical Power and Energy Systems, Alexander von Humboldt Fellow, IEEE Fellow and the recipient of the National Friendship Award (China).

### Speech Contents

### On Big Data supported Applications for Sustainable and Low-Carbon Energy Systems

**Abstract:** The 4th Industrial Revolution, Industry 4.0, is significantly changing the shape of processes in the 21st century, particularly those related to technology, industry and society. Through introduction of smart technologies, doors for designing and implementing smart solutions contributing to security, dependability, flexibility and resilience of modern energy systems, are opened. Newly designed “digital substations” are enabling rapid and efficient transfer of massive quantity of data from the actual electricity network to hierarchically higher centers in which information is processed. Through application of data science-based solutions, integration of renewable energy sources is maximized, different energy vectors are integrated into single multi-energy systems, optimizing processes, making them more efficient and contributing to confident transformation of the existing energy system into a sustainable and low carbon one. The abovementioned issues will be discussed from the new technology perspective, its impact to new solutions and its expected benefits. Some representative practical examples will be presented, too.

# Keynote Speaker VI

**Host 主持人** Assoc. Prof. Haiwang Zhong, Tsinghua University, China

**Time** 15:00-15:30, December 10

**Room** Zoom ID: 82273564217

## Prof. Gianfranco Chicco

**Politecnico di Torino, Italy**

Gianfranco Chicco holds a Ph.D. in Electrotechnics Engineering and is a Full Professor of Electrical Energy Systems at Politecnico di Torino, Italy. He is a Fellow of the IEEE. He received the title of Doctor Honoris Causa from the Universities Politehnica of Bucharest and Gheorghe Asachi of Iasi (Romania) in 2017 and 2018. He is the Editor-in-Chief of Sustainable Energy Grids and Networks, a Subject Editor of Energy, an Editor of the IEEE Transactions on Smart Grid, the IEEE Open Access Journal of Power and Energy, and Energies, and a past Editor of the IEEE Transactions on Sustainable Energy. He was the Conference Chair of WESC 2006, IEEE ISGT Europe 2017 and UPEC 2020. His research activities include Power System Analysis, Distribution System Analysis and Optimization, Electrical Load Management, Energy Efficiency and Environmental Impact of Multi-Energy Systems, Data Analytics for Power and Energy Systems, and Power Quality.

### Speech Contents

### Success and Criticisms of Using Metaheuristic Algorithms in Power and Energy Applications

**Abstract:** The development of metaheuristic algorithms and their application to power and energy system problems has increased considerably in the last years. However, there are some concerns on the nature of the newly proposed metaheuristics and on the actual representativeness of the principles applied in these algorithms. The presentation discusses some reasons of success of the metaheuristic optimization in applications to power and energy systems. Indications are provided to synthesize the main underlying principles of the heuristic optimization algorithms and to understand the key points of effectiveness of these algorithms. A number of cases of incorrect interpretation of the results obtained from the metaheuristics are highlighted. Finally, some best practices are illustrated for setting up the stop criterion for the iterative process based on metaheuristics and for comparing the solutions of metaheuristic optimizations.

# Plenary Speaker III

**Host 主持人** Prof. Hua Geng, Tsinghua University, China

**Time** 8:30-9:10, December 11

**Room** Zoom ID: 82273564217

## Prof. Kaushik Rajashekara

**University of Houston, USA**

Dr. Kaushik Rajashekara received his BE, ME, and PhD from Indian Institute of Science. He joined Delphi division of General Motors Corporation in Indianapolis, IN, USA as a staff project engineer in 1989. In Delphi and General Motors, he held various lead technical and managerial positions, and was a Technical Fellow and the Chief Scientist for developing electric machines, controllers, and power electronics systems for electric, ORAL, and fuel cell vehicle systems. In 2006, he joined Rolls-Royce Corporation as a Chief Technologist for More Electric Architectures and power conversion/control technologies for Electric, More Electric, and ORAL Electric Aircrafts. In August 2012, he joined as a Distinguished Professor of Engineering at the University of Texas at Dallas. Since September 2016, he is a Distinguished Professor of Engineering in University of Houston. Prof. Rajashekara was elected as a Member of the US National Academy of Engineering in 2012, Indian National Academy of Engineering in 2013, and Chinese National Academy of Engineering in 2021 for his contributions to electric power conversion systems in transportation. He is a recipient of 2021 IEEE Medal on Environmental and Safety Technologies, and 2013 Richard Kaufmann award, and several other awards. He has published more than 250 papers in international journals and conferences, has 37 U.S. and 15 foreign patents; and has written one book, and contributed individual chapters to 8 books. His research interests are in the area of power/energy conversion, Transportation Electrification, Renewable Energy, and Subsea Electrification.

### Speech Contents

### Current Trends and Renewable Energy Based Future Strategies for Powering the Offshore Electrical Systems

**Abstract:** The offshore extraction of oil and gas is an energy-intensive process resulting in release of CO2 and methane to the atmosphere. In order to extract the subsea oil and gas, a number of electrical systems are deployed. Many of these subsea electrical systems need high-reliability power grid and power control units located on the seabed. To reduce the emissions from the offshore energy production, it is important to supply the subsea electrical loads using renewable energy sources. The offshore industry has become more significant in recent years because a number of offshore wind farms leading to global installed offshore wind capacity to 54.9 GW by the end of June 2022. One of the applications for offshore wind could be to power the electrical systems located on the sea bed that are required for oil and gas extraction, instead of from the gas turbine or diesel engine generators located on the platform. But there are many challenges for deploying the electrical systems and the power converters on the seabed, and for supplying the renewable electrical power either from the offshore wind or from onshore. This seminar presents the requirements and challenges of operating in the subsea environment, current trends, and use of power electronics for efficient transmission of power from the offshore platform or from onshore to the subsea electrical loads. The presentation also addresses

how the renewable sources such as offshore wind can be used for powering not only the subsea electrical loads, but also for other offshore applications such as production of Hydrogen, shore power, and for powering the ocean vessels.

# Plenary Speaker IV

**Host 主持人**: Prof. Fei Gao, University of Technology of Belfort-Montbeliard (UTBM), France

**Time**: 9:10-9:50, December 11

**Room**: Zoom ID: 82273564217

## Prof. Leila Parsa

**University of California Santa Cruz, Jack Baskin School of Engineering, USA**

Leila Parsa received the Ph.D. degree in electrical engineering from Texas A&M University, College Station, TX, USA, in 2005. She is currently a Professor with the Department of Electrical and Computer Engineering, University of California, Santa Cruz, Santa Cruz, CA, USA. From 2005 to 2016, she was a Faculty Member with the Department of Electrical, Computer, and Systems Engineering, Rensselaer Polytechnic Institute, Troy, NY, USA. Her research interests are in design, analysis and control of electromechanical energy converters and power electronics converters for various applications. Dr. Parsa was the recipient of several awards including the 2009 Office of Naval Research Young Investigator Award, the 2007 IEEE Industry Applications Society Outstanding Young Member Award, and 2006 IEEE Industry Applications Society Transactions Paper Award. She has authored or coauthored more than 100 journal and conference publications. She has served in technical program committee of several IEEE conferences and acted as a Technical Program Co-Chair of IEEE International Electric Machines and Drives Conference in 2015. She is currently an Associate Editor of the IEEE Transactions on Industry Applications and an Editor of the IEEE Transactions on Energy Conversion.

### Speech Contents

### Advances in Electric Powertrains for Aviation Applications

**Abstract:** As with the automotive industry, fully electric powertrains are gaining popularity as a viable technology for the aviation industry. Lower fuel consumption, lower emissions, and reduced noise are among the advantages of electric propulsion. Lower CO2 emissions are an important driver of this technology considering climate goals of governments worldwide. In addition, air travel is predicted to continue to grow which is another motivation for developing electric powertrains for aviation applications. In these applications, reliability is a critical factor. High power density is also essential to reduce the mass of the drivetrain considering aviation's light weight requirements. The ideal system consists of high-power density electric machines and drives together with an integrated thermal management system. This talk presents recent advancements in electric powertrains for the aviation sector. Recent research in superconducting machines for aviation applications will also be discussed.

# Keynote Speaker VII

**Host** 主持人 **Prof. Tao Hong**
**University of North Carolina at Charlotte, USA**

**Time** 9:50-10:20, December 11
**Room** Zoom ID: 82273564217

## Prof. Badrul Chowdhury

**University of North Carolina at Charlotte (UNCC), North Carolina, USA**

Badrul Chowdhury is a Professor in Electrical & Computer Engineering with joint appointment in Systems Engineering & Engineering Management at the University of North Carolina at Charlotte (UNCC), North Carolina, USA. He received his PhD in Electrical Engineering from Virginia Tech, Blacksburg, Virginia, USA. Dr. Chowdhury has contributed to the fundamental analysis, modeling and simulation of renewable and distributed energy resources in power networks. These contributions have advanced the utility grid applications of renewable energy-based resources. His current research interests are in power system modeling, analysis, control and economics; complex multi-modal non-linear system vulnerability and resiliency assessment; integration of renewable and distributed energy resources including wind electric conversion systems, solar PV, energy storage and flexible loads in a smart grid environment; microgrid control and optimization. He is currently serving as the Assistant Director of the Energy Production and Infrastructure Center (EPIC) at UNCC, and Site Director for the Center for Advanced Power Engineering Research (CAPER), an industry-university research consortium in the southeastern United States. Prior to joining UNC-Charlotte, Dr. Chowdhury was a Professor in the ECE Department of Missouri S&T. He has published more than 250 papers in archival journals and conference proceedings. has also directed more than 60 Ph.D and M.S theses in these areas. He is included in Stanford University's list representing the top 2% of the world's most-cited researchers. Dr. Chowdhury is the Chair of the Charlotte Chapter of IEEE PES. He is the Chair of the PES Photovoltaics Working Group and past chair of the PES University Education subcommittee. He is a Senior Member of the IEEE.

## Speech Contents

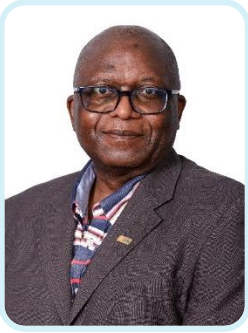
### Realizing Grid Services from Smart Buildings

**Abstract:** Numerous efforts are underway aimed at decarbonizing electricity infrastructures in different regions of the world. Flexible resources like smart buildings are becoming increasingly valuable for this purpose. Load serving entities (LSEs), which typically have access to these resources, can use them for multiple services simultaneously. This presentation will feature a stochastic optimization framework for using clusters of residential HVACs, electric water heaters and behind-the-meter batteries that are spread throughout the LSE's distribution network. The specific purpose is to coordinate energy arbitrage, peak shaving and market-based frequency regulation simultaneously. Real-time dispatch algorithms capable of eliciting fast response from the resources based on regulation signals from the market operator will also be discussed.

# Keynote Speaker VIII

**Host 主持人** Prof. Wenchuan Wu
Tsinghua University, China

**Time** 10:20-10:50, December 11
**Room** Zoom ID: 82273564217



## Prof. Innocent Kamwa

**Laval University, Canada**

Innocent Kamwa obtained his Ph.D. in Electrical Engineering from Laval University in 1989. A full professor in the Department of Electrical Engineering and Tier 1 Canada Research Chair in Decentralized Sustainable Electricity Grids for Smart Communities at Laval University, he was previously a researcher at Hydro-Québec's Research Institute, specializing in the dynamic performance and control of power systems. He was also the Chief Scientist for Hydro-Québec's Smart Grid Innovation Program and an international consultant in power grid simulation and network stability. Dr. Kamwa is a past Editor-in-Chief of IET Generation, Transmission and Distribution, and is currently the Editor-in-Chief of IEEE Power and Energy Magazine and an Associate Editor of IEEE Transactions on Power Systems. A Fellow of the Canadian Academy of Engineering and Fellow of the IEEE for his innovations in power system control, he is also the 2019 recipient of the IEEE Charles Proteus Steinmetz and Charles Concordia Awards.

### Speech Contents

**Propelling the resilience of the 4D power grid (decentralized, decarbonized, digitalized and democratic) through data intelligence**

**Abstract:** The much-desired emergence of a 100% renewable economy is intimately linked to electricity systems dominated by decentralized, decarbonized energy resources interfaced by power electronics. This radical change requires a rethinking of the way we design, protect, control and optimize the operation of electricity grids, which will have to be smarter to maintain the level of resilience expected by civil society. The presenter will question the role that AI can play in this context, taking advantage of the many data sources, with different temporal granularity and accuracy, to improve the resilience of the network in the face of the increased uncertainties and risks of instability inherent in the massive switch to autonomous energy devices, capable of decentralized interactions. For example, we will examine the extent to which AI can eliminate "man from the feedback control loop of networks" in order to propel their resilience through further automation of operation.

# Keynote Speaker IX

**Host 主持人** Prof. Zhanbo Xu
Xi'an Jiaotong University, China

**Time** 13:30-14:00, December 11
**Room** Zoom ID: 82273564217

## Prof. Qiuye Sun

**Northeastern University, China**

Qiuye Sun received the Ph.D. degree in control theory and engineering in 2007 from Northeastern University, Shenyang, China, where he became a professor in 2015. He is the executive Dean of school of Innovation and Entrepreneurship of Northeastern University. He is IET Fellow, IEEE Senior Member, National Special Support Plan for High-Level Talents (National "Ten Thousand Person Plan"), and obtained special government allowances of the state council. He is the chair of several important academic conferences in the field of control, including 39th CCC and 2th ICITEL, and the editorial board of many important journals at home and abroad, including IEEE Trans NNLS, IET Cyber-Physical Systems and ACTA AUTOMATICA SINICA. His research interests are energy internet, smart energy and cyber physical systems. He has published more than 200 papers on high-level academic journals. Representative papers were selected as ESI highly cited papers. His paper titled Reduced-Order Transfer Function Model of the Droop-Controlled Inverter via Jordan Continued-Fraction Expansion was selected as one of Best Paper Award for the IEEE Transactions on Energy Conversion in 2020-2021. He has won the Award of National Natural Science, National Science and Technology Progress, Ministry of Education Science and Technology Progress, and CAA Science and Technology Progress.

## Speech Contents

### Large-scale Open-Source Test System for Integrated Energy System

**Abstract:** In recent years, in order to alleviate the energy crisis, the integrated energy system has developed rapidly and been widely used in many areas. In the research process of integrated energy system, a significant problem is that the public can't get the real integrated energy system model, which hinders the innovation and development of integrated energy system to some extent. At the same time, due to privacy, security and other factors, some existing test cases of integrated energy system cannot provide key elements such as structure, model, parameters and data. Therefore, it is of great significance to create a test system that can meet the requirements of diversification to promote the research of integrated energy system.

According to the characteristics of object-oriented energy production and transmission, integrated energy system can be divided into three levels: cross-regional level, regional level and user level. Regional integrated energy system plays an important role in connecting the preceding with the following in these three levels. Therefore, it is also the main object of our research. We consider three principles to build the regional integrated energy system, that is authenticity, security and futurism. The authenticity means that physical structure of each sub-system (such as the power system, heat network and gas network) refers to the practice network or the widely studied network. For the security, we employ the complex network controllability theory coming from Nature to reconfigure the test system and reasonably add the coupled devices. Through this method, the test system has strong controllability and flexibility. In addition, we also consider future development trend of energy network such as large scale, scalability and flexibility, that is the so-called

futurism. Based on the above principles, we have built a large-scale regional integrated energy testing system with 1032 nodes and divided into eight different characteristics and application scenarios.

# Keynote Speaker X

**Host 主持人** Prof. Alian Chen, Shandong University, China

**Time** 14:00-14:30, December 11

**Room** Zoom ID: 82273564217

## Prof. Hong Li

**Beijing Jiaotong University, China**

Hong Li (Senior Member, IEEE) received the M.Sc. degree in electrical engineering from South China University of Technology, Guangzhou, China, in 2005, and the Ph.D. degree in electrical engineering from Fernuniversität in Hagen, Germany, in 2009. She is currently a Full Professor with the School of Electrical Engineering, Beijing Jiaotong University, Beijing, China. She has published 1 book, 70 journal papers, and 63 conference papers. She has also authorized 30 patents. Her research interests include nonlinear modeling, analysis and its applications, EMI suppressing methods for power electronic systems, wide bandgap power devices and applications. Dr. Li is an Associate Editor of the IEEE Transactions on Industrial Electronics, an Associate Editor of IEEE Transactions on Power Electronics, , an Associate Editor of the IEEE Open Journal of Industrial Electronics Society, an Associate Editor of the Chinese Journal of Electrical Engineering, She is the Vice Chairman of IEEE PELS China and the Vice Chairman of Electromagnetic Compatibility Specialized Committee in China Power Supply Society.

### Speech Contents

### A General Time-domain Stability Analysis Method of Power Converters System and Stability Improving Controls

**Abstract:** Different from the traditional frequency-domain stability analysis method, this report focus on the time-domain modeling and stability analysis of power converters system. Considering the complexity of the traditional frequency-domain stability analysis method in multi-converters system, a general time-domain stability analysis method based on Floquet theory is introduced and verified in theory, simulation and experiment. This method can used not only in DC-DC converters system, including LLC converters system, DC-AC inverters system, but also in the ORAL converters system with DC-DC converter and DC-AC converter. Furthermore, based on this time-domain stability criteria and eigenvalue sensitivity, the stability improving controls are deduced, finally, the universality and practicality of these controls are proved by simulation and experiment both.

# Keynote Speaker XI

**Host 主持人** Prof. Wei Xu
Huazhong University of Science and Technology, China

**Time** 14:30-15:00, December 11
**Room** Zoom ID: 82273564217

## Assoc. Prof. Zedong Zheng

**Tsinghua University, China**

Zedong Zheng, Associate Professor of Tsinghua University, Doctoral Supervisor, IET Fellow, IEEE Senior Member, Deputy Director of the Green Transportation Research Center of the Energy Internet Innovation Research Institute of Tsinghua University, Director of the Third Generation Semiconductor Materials and Devices R&D Center of the Shenzhen Tsinghua University Research Institute, Member of the Management Committee of the Tsinghua University (Department of Electrical Engineering)-Qingdao Yunlu Advanced Materials Technology Co., Ltd. Joint Research Center for Advanced Magnetic Materials and Efficient Energy Conversion.

## Speech Contents

### Application of new magnetic components in energy system

**Abstract:** With the rapid development of new power systems, the demand for power electronic equipment has increased significantly. Power electronic equipment is widely used in distribution network, new energy power generation, new energy vehicles and other fields. Magnetic components are the key components in power electronic equipment, which greatly affect the power density and efficiency of the equipment. With the trend of high frequency of power electronics, the design of magnetic components faces new challenges. Based on new soft magnetic materials, this report proposes a multi-physics analytical model for high-frequency magnetic components, further improves the traditional design method, and achieves the comprehensive optimal design for both power density and efficiency.

# Keynote Speaker XII

**Host** 主持人: Prof. Xiaoqiang Guo, Yanshan University, China

**Time**: 15:00-15:30, December 11

**Room**: Zoom ID: 82273564217

## Assoc. Prof. Meng Huang

**Wuhan University, China**

Meng Huang (Member, IEEE) is an Associate Professor with the School of Electrical Engineering and Automation, Wuhan University. His research interests include stability and reliability of power electronics systems. He has published 1 book, 40 journal papers, including 1 ESI highly cited paper. He was a recipient of the Best Paper Award of the IEEE Transactions on Power Electronics in 2016 and the Excellent Paper Award of the CSEE Journal of Power and Energy Systems in 2020. He served as the Corresponding Guest Editor for the IEEE Journal on Emerging and Selected Topics in Circuits and Systems and the Guest Associate Editor for the IEEE Journal of Emerging and Selected Topics in Power Electronics.

## Speech Contents

### Resilient Operation of Grid-connected Power Electronics Systems

**Abstract:** During severe power grid fault strikes, the grid-connected power electronics system may fail to operate normally due to the fast transient response and nonlinear dynamics of power electronics converters. In this talk, the stability problems, including the voltage and synchronization stability of the grid-connected system will be re-visited. The resilient operation boundary and control strategy will be given according to stability and stress analysis. Moreover, future challenges of the grid-connected system will be discussed.

# Session 1

**December 10, 2022**
**Time Zone: GMT+8**

**Topic: Modeling and stability analysis of renewable energy system 1 | 新能源系统建模及稳定性分析 1**
**Zoom 1 ID: 82273564217**
**Time: 15:45- 17:45 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Dr. Junliang Liu, Chongqing University, China**

**ORAL**

| | |
|---|---|
| **ModelingTech** | **Title:** Switch RonRoff Model-Based Power Electronics FPGA Simulation Solver<br>**Presenter:** Kevin.Wang（Chief Engineer）<br>**Affiliation:** ModelingTech Energy Technology Co., Ltd., China |
| **SE0298** | **Title:** The Analytical Switching Modelling Method of Grid-Connected Converters for Transient Stability Analysis<br>**Author(s):** Wenze Ding, Hua Geng, Bixing Ren, Qiang Li and Rong Sun<br>**Presenter:** Wenze Ding<br>**Affiliation:** Tsinghua University, China |
| **SE0364** | **Title:** Performance Analysis on Hydrogen-battery Coordination Storage for Renewable Energy Accommodation in Large-scale Power System<br>**Author(s):** Xiaopan Chen, Qi Yang, Na Meng, Yan Cheng, Jiang Wu and Guanchu Chen<br>**Presenter:** Xiaopan Chen<br>**Affiliation:** Xi'an Jiaotong University, China |
| **SE0118** | **Title:** Fault Ride Through Strategy for Wind Farm Integration System via MMC-HVDC<br>**Author(s):** Xiong Xuejun, Zhou Meng, Zhao Le, Jiang Youhua<br>**Presenter:** Zhou Meng<br>**Affiliation:** Shanghai University of Electric Power, China |
| **SE0454** | **Title:** Transient Stability Analysis of the Standalone System Constructed by Paralleled Grid-Forming Converters Under Symmetrical Short-Circuit Fault<br>**Author(s):** Zhang Jiayan, Lin Xinchun, Huang Guangzhou, Sun Huiqiang, Liu Dan, Jiang Kezheng<br>**Presenter:** Zhang Jiayan<br>**Affiliation:** Huazhong University of Science and Technology, China |
| **SE0347** | **Title:** Day-ahead Scheduling Model for Power Systems with a High Proportion of Renewable Energy<br>**Author(s):** Chengxiang Ling, Xianjue Luo, Ningning Li, Yan Yue, Shuyi Ren and Yuxi Chen<br>**Presenter:** Chengxiang Ling<br>**Affiliation:** Xi'an Jiaotong University, China |

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| | **SE0400** | **Title:** Suppression of Sub-Synchronous Oscillation of Offshore Wind Farm Integrated by AC-DC Parallel System<br>**Author(s):** Jie Song, Da Li, Xiaoying Zhang, Qiyu Lu, Xuanze Zuo and Xiaoyan Bian<br>**Presenter:** Xuanze Zuo<br>**Affiliation:** Shanghai University of Electric Power, China |
| | **SE0114** | **Title:** Multi-objective Sizing Optimization Method of Microgrid Considering Cost and Carbon Emissions<br>**Author(s):** Xiang Zhu, Chao Peng, Hua Geng<br>**Presenter:** Xiang Zhu<br>**Affiliation:** Tsinghua University, China |

# Session 2

**December 10, 2022**
**Time Zone: GMT+8**

**Topic: Design and control for electrical machines and drives | 新型磁材料与电机设计**
**Zoom 2 ID: 88531611705**
**Time: 15:45-17:30 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Prof. Wei Xu, Huazhong University of Science and Technology, China**

**ORAL**

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| SE0344 | **Title:** Three-phase Current Unbalance Suppression Method of Linear Induction Motor Based on PR Controller<br>**Author(s):** Haonan Gu, Zhiwei Cai, Zhe Wang, Yongkang Zhang, Wenbo Dong and Ruicheng Guo<br>**Presenter:** Haonan Gu<br>**Affiliation:** Technology and Engineering Center for Space Utilization, China |
| SE0381 | **Title:** IPMSM Electromagnetic Noise Impact Analysis based on Rotor Radial Parameter Optimization<br>**Author(s):** Xiaocan Wang, Yudong Li, Penghui Yuan, Zhenchuan Shi, Wei Xie and Sunyi Chen<br>**Presenter:** Xiaocan Wang<br>**Affiliation:** Xiamen University of Technology, China |
| SE0395 | **Title:** Position Sensorless Composite Control of Hybrid Excitation Axial Field Flux-Switching Permanent Magnet Machine<br>**Author(s):** Huayang Jin, Wei Zhang and Jiale Wang<br>**Presenter:** Huayang Jin<br>**Affiliation:** Nantong University, China |
| SE0475 | **Title:** Iron Core Loss of Amorphous Alloy High Speed PMSM With Variable Frequency Supply Used for Micro Gas Turbine Power Generation<br>**Author(s):** Mingji Liu, Huan Hu, Kai Lu, Hongjin Li, Chuan Gao, Zhongqin Cai<br>**Presenter:** Huan Hu<br>**Affiliation:** North China Electric Power University, China |
| SE0509 | **Title:** Improved Active Disturbance Rejection Control for PMSM Based on Modified Extended State Observer<br>**Author(s):** Xianxin Zhou, Qiang Xu<br>**Presenter:** Xianxin Zhou<br>**Affiliation:** Huazhong University of Science and Technology, China |
| SE0246 | **Title:** PMSM Vector Control Based on Sliding Mode and Improved PR Controller<br>**Author(s):** Yugang Li, Xiaojian LUAN, Chuanxiao Wang<br>**Presenter:** Xiaojian LUAN<br>**Affiliation:** Qufu Normal University, China |

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| | SE0396 | **Title:** Multi-objective Optimal Predictive Control of Axial Field Flux-Switching Permanent Magnet Machine<br>**Author(s):** Jianbiao He, Wei Zhang and Haojie Fan<br>**Presenter:** Huayang Jin<br>**Affiliation:** Nantong University, China |

# Session 3

**December 10, 2022**
**Time Zone: GMT+8**

**Topic: The application of real-time simulation for systems with high penetration of power electronic interfaced technologies | 实时仿真在电力电子化系统的应用**
**Zoom 3 ID: 87069632470**
**Time: 15:45- 17:30 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Assoc. Prof. Rui Ma, Northwestern Polytechnical University, China**

**ORAL**

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| SE0448 | **Title:** A Stackelberg Game-Based Bargaining Model Between Electric Vehicles and the Hybrid AC/DC Microgrid<br>**Author(s):** Yuxuan Ai, Yibin Qiu, Qi Li, Lanjia Huang, Weirong Chen<br>**Presenter:** Yuxuan Ai<br>**Affiliation:** Southwest Jiaotong University, China |
| SE0519 | **Title:** FPGA-based Real-Time Simulation of Five-Phase PMSM for the HIL Applications<br>**Author(s):** Nan Wang, Hao Bai, Ruiqing Ma, Gang Huang<br>**Presenter:** Nan Wang<br>**Affiliation:** Northwestern Polytechnical University, China |
| SE0377 | **Title:** Datasheet Driven Electro-Thermal Real-Time Simulation of Power Electronics Converter<br>**Author(s):** Jiaxin Tang, Hao Bai, Ruiqing Ma, Dongdong Zhao, Nan Wang, Gang Huang<br>**Presenter:** Hao Bai<br>**Affiliation:** Northwestern Polytechnical University, China |
| SE0305 | **Title:** An Artificial Neural Network-Based System-Level Modeling of Power Converters for Real-Time Simulation<br>**Author(s):** Qian Li, Elena Breaz, Hao Bai, Robin Roche, Fei Gao<br>**Presenter:** Qian Li<br>**Affiliation:** Université de technologie de Belfort Montbéliard (UTBM), France |
| SE0375 | **Title:** Multirate Co-Simulation of Integrated Energy Systems based on Functional Mock-Up Interface<br>**Author(s):** Yonghua Chen, Wei Li, Yanfei Li, Junda Wu, Xiaopeng Fu<br>**Presenter:** Xiaopeng Fu<br>**Affiliation:** Tianjin University, China |
| SE0135 | **Title:** Coordinated Adaptive Control Strategy of Rotational Inertia and Damping Coefficient for Virtual Synchronous Generator<br>**Author(s):** Tianhong Wang, Qi Li, Xiaowen Chen, Weirong Chen, Alexandre Ravey, Elena Breaz, Fei Gao<br>**Presenter:** Xiaowen Chen<br>**Affiliation:** Southwest Jiaotong University, China |

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| | SE0408 | **Title:** Suppression of Sub-Synchronous Oscillation of Offshore Wind Farm Integrated by AC-DC Parallel System<br>**Author(s):** Jie Song, Da Li, Xiaoying Zhang, Qiyu Lu, Xuanze Zuo and Xiaoyan Bian<br>**Presenter:** Xuanze Zuo<br>**Affiliation:** Shanghai University of Electric Power, China |

# Session 4

**December 10, 2022**
**Time Zone: GMT+8**

**Topic: Coordinated Operation, Control and Cyber-physical Security of Smart Energy System | 智慧能源系统的协调运行、控制与信息物理安全**
**Zoom 4 ID: 83118449166**
**Time: 15:45-17:00 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Dr. Yulin Chen, Hainan Institute of Zhejiang University, China**

**ORAL**

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| **SE0333** | **Title:** An Optimal Planning Model for Cyber-physical Active Distribution System Considering the Reliability Requirements<br>**Author(s):** Changjiang Wang, Chutian Yu, Xunhu Yin, Lijun Zhang, Xiang Yuan and Mingxia Fan<br>**Presenter:** Changjiang Wang<br>**Affiliation:** Zhejiang University, China |
| **SE0325** | **Title:** Optimal Distributed Cooperative Control Strategy for Frequency Restoration in AC Microgrid under Malicious Attacks<br>**Author(s):** Xueqi Wang, Yaxin Wang, Yulin Chen, Donglian Qi<br>**Presenter:** Xueqi Wang<br>**Affiliation:** Zhejiang University, China |
| **SE0518** | **Title:** Review of Evaluating Schedule Potential of Flexible Loads in Regulation Services of Power Systems<br>**Author(s):** Yuhang Sun, Kang Xie, Yi Li, Baozhong Zhou, Shijie Sun, Jiguang Zhang<br>**Presenter:** Yuhang Sun<br>**Affiliation:** Zhejiang University, China |
| **SE0383** | **Title:** Random Number Generation Based DoS Attack-resilient Distributed Secondary Control Strategy<br>**Author(s):** Shuang Qie, Jian Dou, Xuan Liu, Yue Tang, Yupeng Zhang, Yi Zheng<br>**Presenter:** Yi Zheng<br>**Affiliation:** Zhejiang University, China |
| **SE0331** | **Title:** Cascading Failure Propagation in Cyber Physical Power Systems Under Extreme Weather Events<br>**Author(s):** Chutian Yu, Lijun Zhang, Shijie Sun, Yikai Sun, Xunhu Yin and Changjiang Wang<br>**Presenter:** Xunhu Yin<br>**Affiliation:** Zhejiang University, China |

# Session 5

**December 10, 2022**
**Time Zone: GMT+8**

**Topic: Intelligent electrical equipment and reliability evaluation | 智能电气设备及可靠性评估**
**Zoom 5 ID: 815 9467 4058**
**Time: 15:45- 17:45 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Prof. S. M. Muyeen, Qatar University, Qatar**

**ORAL**

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| SE0371 | **Title:** Reactive Power Distribution of Mesh Parallel Distributed Generations based on Virtual Impedance<br>**Author(s):** Xiaobin Zhang, Yue Li, Yifan Wen, Jia Shen, Chengkai Li and Sige Xiao<br>**Presenter:** Yue Li<br>**Affiliation:** Xi'an University of Technology, China |
| SE0420 | **Title:** A protection scheme for low voltage DC distribution system based on control and protection cooperation<br>**Author(s):** Qiang Liu, Shengwen Li, Runquan Meng, Jingchong Huo, Shaozhe Jiang and Ruishu Li<br>**Presenter:** Qianng Liu<br>**Affiliation:** Taiyuan University of Technology, China |
| SE0139 | **Title:** Fault Analysis and Improved Strategy for Trigger Signal Caused UHVDC Commutation Failures<br>**Author(s):** Hui Sun, Tongwen Wang, Guoqiang Zheng, Jinjin Ding, Xuqi Zhou, Huafeng Xiao<br>**Presenter:** Xuqi Zhou<br>**Affiliation:** Southeast University, China |
| SE0124 | **Title:** Parameters Design for Virtual Synchronous Generator Under Unbalanced Voltage<br>**Author(s):** Xiaobin Zhang, Chengkai Li, Sige Xiao, Yue Li, Yifan Wen<br>**Presenter:** Chengkai Li<br>**Affiliation:** Xi'an University of Technology, China |
| SE0195 | **Title:** Power System Transient Stability Assessment Based on Graph Neural Network With Interpretable Attribution Analysis<br>**Author(s):** Sili Gu, Ji Qiao, Zixuan Zhao, Qiongfeng Zhu and Fujia Han<br>**Presenter:** Ji Qiao<br>**Affiliation:** Jiateng Li, China Electric Power Research Institute, China |
| SE0340 | **Title:** A Lightweight Cascaded Mutilevel Solid State Transformer Scheme Based on Ripple-Power Decoupling Channel<br>**Author(s):** Jiaxun Teng, Lei Qi, Wei Zhao, Min Zhang, Yanping Zhu and Xiaofeng Sun<br>**Presenter:** Jiaxun Teng<br>**Affiliation:** Yanshan University, China |

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| | **SE0112** | **Title:** Thermal Sensitive Parameters Extraction Method of UHVDC Thyristors Based on TCAD<br>**Author(s):** Hui Sun, Xuqi Zhou, Guoqiang Zheng, Jingjing Ding, Tongwen Wang, Huafeng Xiao<br>**Presenter:** Xuqi Zhou<br>**Affiliation:** Southeast University, China |
| | **SE0361** | **Title:** Synchronous Oscillation Damping of Converters under Complex Control Coupling<br>**Author(s):** Xiaobin Zhang, Sige Xiao, Chengkai Li, Yue Li, Yifan Wen and Jia Shen<br>**Presenter:** Sige Xiao<br>**Affiliation:** Xi'an University of Technology, China |

# Session 6

**December 10, 2022**
**Time Zone: GMT+8**

**Topic: Power electronic device and its reliability 1|电力电子器件及可靠性 1**
**Zoom 7 ID: 899 5509 2559**
**Time: 15:45-16:30**

**POSTER**

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| SE0084 | **Title:** Active Current Limiting Scheme for Offshore Wind Power Outgoing DC/DC Converter Faults<br>**Author(s):** Shuangjie Fan, Qihui Liu, Zhongyu Liang, Chengcheng Hong, Xiaojiang Guo, Haiyan Tang, Xuhui Shen, Xueshen Cui<br>**Presenter:** Shuangjie Fan<br>**Affiliation:** North China Electric Power University, China |
| SE0329 | **Title:** Quantitative Analysis of Small-sized Transformer No-load Closing Inrush Current Considering Leakage Inductance<br>**Author(s):** Zhiheng Cai, Jiaju Wu and Liangliang Chen<br>**Presenter:** Zhiheng Cai<br>**Affiliation:** Nanchang Hangkong University, China |
| SE0238 | **Title:** Double-Layer Cycle Capacity Optimization Model of Rural Biogas-Solar-Wind Integrated Energy System<br>**Author(s):** Aodong Cai, Bo Sun, Runzhi Wang, Mingyuan Wang, Qingqing Chi, Le Yang<br>**Presenter:** Aodong Cai<br>**Affiliation:** Shandong University, China |
| SE0196 | **Title:** An ISOS-SAB DC/DC Converter for Large Capacity Offshore Wind Turbine<br>**Author(s):** Yixin Liu, Chengcheng Hong, Qihui Liu, Xiaojiang Guo, Haiyan Tang, Xuhui Shen, Zheng Li, Xueshen Cui<br>**Presenter:** Yixin Liu<br>**Affiliation:** North China Electric Power University |
| SE0142 | **Title:** A Data-Driven Fault Diagnosis Method with Dimension Reduction Capability for Inverter Open-circuit Fault of Multiphase Drive Systems<br>**Author(s):** Lanlan Fang, Zicheng Liu, Dong Jiang, Ronghai Qu<br>**Presenter:** Lanlan Fang<br>**Affiliation:** Huazhong University of Science and Technology, China |
| SE0231 | **Title:** A Non-invasive Online ESR Estimating Method for DC-Link Capacitors of UPS<br>**Author(s):** Zhihua Chen, Qiongbin Lin, Kai Yu, Xianjin Su, Wei Du<br>**Presenter:** Zhihua Chen<br>**Affiliation:** Fuzhou University, China |

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| | SE0168 | **Title:** Life Prediction Method for Power Device of Traction Inverter in Metros<br>**Author(s):** Pengcheng Xu, Kexin Yang, Tao Tang, Na Sun, Cunxin Ye, Wensheng Song<br>**Presenter:** Pengcheng Xu<br>**Affiliation:** Southwest Jiaotong University, China |
| | SE0178 | **Title:** An Improved Parameter Design Method of Active Clamping Circuit for Voltage Balancing of Series-Connected IGBTs<br>**Author(s):** Xiangyu Yang, Hua Lin, Tao Wang<br>**Presenter:** Xiangyu Yang<br>**Affiliation:** Huazhong University of Science and Technology, China |
| | SE0472 | **Title:** Multisampling Robust Predictive Current Control for High Speed Permanent Magnet Synchronous Motor<br>**Author(s):** Mingji Liu, Hongjin Li, Zhongqin Cai, Chuan Gao, Huan Hu, Kai Lu<br>**Presenter:** Hongjin Li<br>**Affiliation:** North China Electric Power University, China |

# Session 7

**December 10, 2022**
**Time Zone: GMT+8**

**Topic: Topology and control of power converters 1 | 电力电子变换器拓扑与控制 1**
**Zoom 7 ID: 899 5509 2559**
**Time: 16:30-17:10**

**POSTER**

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| SE0268 | **Title:** A Novel Three-port Photovoltaic Micro-inverter with Active Power Decoupling Method<br>**Author(s):** Chenyu Sun, Congcong Li, Siqi Li and Yingying Zhang<br>**Presenter:** Chenyu Sun<br>**Affiliation:** Hefei University of Technology, China |
| SE0297 | **Title:** Analysis of Robustness Enhanced LCL Filter Design Based on Stability Region<br>**Author(s):** Yuanzhe Ren, Hua Lin, Shaojie Li and Xingwei Wang<br>**Presenter:** Yuanzhe Ren<br>**Affiliation:** Huazhong University of Science and Technology, China |
| SE0359 | **Title:** Modeling and Terminal Characteristics of Grid-Connected Inverter with Faulty Control Strategies<br>**Author(s):** Yi Zhang, Zhixiang Zou, Zhiren Liu, Jian Tang, Xingqi Liu and Ruokai Xu<br>**Presenter:** Yi Zhang<br>**Affiliation:** Southeast University, China |
| SE0018 | **Title:** Research on High Efficiency Hybrid Control Scheme of CLLC Resonant Converter<br>**Author(s):** Wenhua Wang, Wanjun Lei, Yilin Yin<br>**Presenter:** Wenhua Wang<br>**Affiliation:** Xi'an Jiaotong University, China |
| SE0040 | **Title:** A Power Balance Control Strategy for Photovoltaic Cascaded Multilevel Inverter<br>**Author(s):** Mengze Wu, Xing Zhang, Mingda Wang, Pingzhou Wang, Qiaohua Zhu, Xinxin Fu<br>**Presenter:** Mengze Wu<br>**Affiliation:** Hefei University of Technology, China |
| SE0071 | **Title:** Analysis of Abnormal Operation of Heavy Overload Control Device Based on Battery Energy Storage<br>**Author(s):** Junyu Liang, Xingyu Yuan, Jiaquan Yang, Yang Yang, Peng Li, Jianbo Jiang<br>**Presenter:** Jianbo Jiang<br>**Affiliation:** Dali University, China |

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| | SE0175 | **Title:** Current Limiting Strategy of Grid-forming Converter Based on Additional Current Loop<br>**Author(s):** Jiahui Xi, Jinyuan Wang, Jingyi Zhang, Yan Zhang, Chenbo Su, Chongru Liu<br>**Presenter:** Jinyuan Wang<br>**Affiliation:** North China Electric Power University, China |
| | SE0497 | **Title:** A Family of Dual Asymmetrical PWM DC-DC Converter with Wide ZVS Range and Reduced Filter Inductor<br>**Author(s):** Jianhua Zhang, Lei Zhao, Yongle Chen<br>**Presenter:** Jianhua Zhang<br>**Affiliation:** Shantou University, China |

# Session 8

**December 10, 2022**
**Time Zone: GMT+8**

**Topic: Modern power system: stability and control 1| 新型电力系统稳定分析与控制 1**
**Zoom 8 ID: 86964064559**
**Time: 15:40-16:25**

**POSTER**

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| SE0334 | **Title:** Research on Power Grid Auxiliary Frequency Regulation Technology Based on Electrolytic Aluminum High-Energy Load Regulation<br>**Author(s):** Yiqian Yin, Xiaoxiang Sun, Tong Li, Ning Mi, Hailiang Zhong and Jianping Yu<br>**Presenter:** Yiqian Yin<br>**Affiliation:** Hohai University, China |
| SE0376 | **Title:** Research on Planning Technology of Integrated Wind-Solar-Thermal-Storage Energy Base<br>**Author(s):** Haiyan Tang, Lei Ba, Xiaoyuan Bai, Liang Cao and Xuhui Shen<br>**Presenter:** Lei Ba<br>**Affiliation:** China Huaneng Group Clean Energy Technology Research Institute Co., Ltd, China |
| SE0122 | **Title:** Frequency Response Model of Doubly Fed Induction Generator Wind Turbine<br>**Author(s):** Luyang Li, Lei Chen, Yong Min, Xuejun Xiong, Yuyao Feng and Pei Yi<br>**Presenter:** Luyang Li<br>**Affiliation:** Tsinghua University, China |
| SE0506 | **Title:** Control Design of Grid Forming STATCOM for Grid with HVDC Receiving Side<br>**Author(s):** Zhichang Yang, Guoliang Zhao, Chaobo Dai, Hongyang Yu, Xiaoge Liu and Kai Hu<br>**Presenter:** Zhichang Yang<br>**Affiliation:** State Grid Smart Grid Research Institute, China |
| SE0290 | **Title:** Passivity-based Robust Stability Control of Heterogeneous DGs in Microgrid<br>**Author(s):** Wenkai Yuan, Laijun Chen, Sicheng Deng and Shengwei Mei<br>**Presenter:** Wenkai Yuan<br>**Affiliation:** Tsinghua University, China |
| SE0091 | **Title:** Review of Frequency Response Analysis and Evaluation Methods for New Power System<br>**Author(s):** Dai Binhua, Ye Lin, Zhao Yongning, Wang Kaifeng, Liao Haohan<br>**Presenter:** Dai Binhua<br>**Affiliation:** China Agricultural University, China |

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| | SE0256 | **Title:** Improving the Fault Ride-through Capability of DFIG-Based-Wind Turbines using the Dynamic Impedance<br>**Author(s):** Yabo Liang, Yunzhu Cao, Lei Li, Yaru Sheng, Jian Niu, Jianan He, Chao Li and Bin Li<br>**Presenter:** YunZhu Cao<br>**Affiliation:** Tianjin University, China |
| | SE0287 | **Title:** Improved Frequency Divider Based on Frequency Response Model of Grid-Following VSC<br>**Author(s):** Qingyuan Ma, Lei Chen and Luyang Li, Jun Qi, Xiwei Jiang and Yong Min<br>**Presenter:** Qingyuan Ma<br>**Affiliation:** Tsinghua University, China |
| | SE0295 | **Title:** A Multi-contingency Preventive Control Method for Static Voltage Stability<br>**Author(s):** Hao Chen, Yanqiang Shi, Yishan Shi, Yijing Zhang, Yi Zhou, Jianyu Lu and Ruipeng Guo<br>**Presenter:** Yishan Shi<br>**Affiliation:** East Branch of State Grid Corporation of China, China |

# Session 9

**December 10, 2022**
**Time Zone: GMT+8**

**Topic: Fault diagnosis and protection of power system 1 | 电力系统故障检测及保护控制 1**
**Zoom 8 ID: 86964064559**
**Time: 16:25-17:15**

**POSTER**

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| SE0349 | **Title:** A Detection Method for Detuned Components of DC Filters in UHVDC System Based on Harmonic Current and Harmonic Impedance Information<br>**Author(s):** Bin Yu, Tongwen Wang, Min Xie, Zengbao Zhuang, Xiaohui Liu and Huafeng Xiao<br>**Presenter:** Zengbao Zhuang<br>**Affiliation:** Nanjing NR Electric Co. Ltd., China |
| SE0366 | **Title:** A Fault-Tolerant Control Method Based on Switching Sequences Reconstruction for Cascaded Three-Level Rectifiers<br>**Author(s):** Huanqi Wang, Chunshui Du, Wenlu Cai and Qianliang Zhao<br>**Presenter:** Huanqi Wang<br>**Affiliation:** Shandong University, China |
| SE0100 | **Title:** Optimization of adaptive current protection setting for distribution network considering the interconnection of PV<br>**Author(s):** Wenlin Liu, Guomin Luo and Yuanwei Song<br>**Presenter:** Wenlin Liu<br>**Affiliation:** Beijing Jiaotong University School of Electrical Engineering, China |
| SE0206 | **Title:** SMO-ESO-Based Voltage Sensorless Model Predictive Control for PWM Rectifier<br>**Author(s):** Haocheng Wang, Yongjun Zhang, Xiong Xiao, Xiaowen Wang and Shuo Han<br>**Presenter:** Haocheng Wang<br>**Affiliation:** University of Science and Technology Beijing, China |
| SE0504 | **Title:** Development of Rogowski coil current sensor for traveling wave current and power frequency current in fault location device<br>**Author(s):** Wei Yi, Kaihui Shen, Chunchao Hu, Yanxu Zhang, Qiran Zhang and Zhiyong Li<br>**Presenter:** Yi Wei<br>**Affiliation:** China Southern Power Grid Technology Co.,Ltd., China |
| SE0232 | **Title:** Optimal Configuration of Energy Storage in Distribution Network Considerating Catastrophe Situation Comprehensively<br>**Author(s):** Hongyun Fu, Hongbin Wu, Yuting Hua, Zhe Liu, Chao Pan, Lulu Wang<br>**Presenter:** Hongyun Fu<br>**Affiliation:** Hefei University of Technology, China |

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| | **SE0339** | **Title:** Research on Low Voltage Ride Through and Reactive Power Support of Hydrogen Production Power Supply<br>**Author(s):** Mingqi Zhang, Ruitong Liu, Kui Wang, Kai Sun, Qinglai Guo and Yongdong Li<br>**Presenter:** Mingqi Zhang<br>**Affiliation:** Tsinghua University, China |
| | **SE0358** | **Title:** Vibration Fault Diagnosis of Circuit Breaker Based on CGWO-VMD and ELM Combined with PCA<br>**Author(s):** Zhenhai Sun, Lei Mu, Feng Li, Ning Wei, Yang Wang, Shoushan Wu, Min Lei and Liu Qinzhe<br>**Presenter:** Liu Qinzhe<br>**Affiliation:** Shangdong University, China |
| | **SE0192** | **Title:** Adaptability Analysis of Power Frequency Variation Distance Protection for AC-side of Receiving-end Converter of Offshore Wind Power MMC-HVDC System<br>**Author(s):** Su Yu, Zexin Zhou, Xingguo Wang, Qi Cheng, Shuyang Wang and Jiaqi Liu<br>**Presenter:** Su Yu<br>**Affiliation:** China Electric Power Research Institute, China |
| | **SE0160** | **Title:** Fault Identification of Winding Axial Displacement and Inter-turn Short Circuit for UHVDC Transformer<br>**Author(s):** Bin Yu, Tongwen Wang, Min Xie, Feng Jiang, Xiaohui Liu and Huafeng Xiao<br>**Presenter:** Huafeng Xiao<br>**Affiliation:** Southeast University, China |

# Session 10

**December 10, 2022**
**Time Zone: GMT+8**

**Topic: DC power transmission and DC power grid 1 | 直流输电与直流电网 1**
**Zoom 8 ID: 86964064559**
**Time: 17:15-17:55**

**POSTER**

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| SE0345 | **Title:** The Protection and Coordinated Control Study of VSC-HVDC Access System for Large-scale Offshore Wind Power<br>**Author(s):** Lin Liu, Ying Pu and Yajun Lu<br>**Presenter:** Lin Liu<br>**Affiliation:** State Grid Economic and Technological Research Institute Co., Ltd, China |
| SE0428 | **Title:** On-line Monitoring System of DC Intelligent Circuit Breaker Based on ARM and FPGA<br>**Author(s):** Luo Qi-Quan, Lei Yuan-Lin, Huang Yuan-Feng, Fan Zhipeng<br>**Presenter:** Luo Qi-Quan<br>**Affiliation:** Wuhan Institute of Technology, China |
| SE0042 | **Title:** Subsequent Commutation Failure Suppression Method Based On Optimized Current Error Controller Parameters<br>**Author(s):** Zhixian Li, Chongru Liu, You Zuo, Yibo Shi<br>**Presenter:** You Zuo<br>**Affiliation:** North China Electric Power University, China |
| SE0046 | **Title:** Improved Deadbeat Predictive Control for MMC Based Flexible Multi-State Switch<br>**Author(s):** Zixun Pan, Xiaofeng Yang, Chenyang Cui, Yanbin Zhang , Kaifeng Wang<br>**Presenter:** Xiaofeng Yang<br>**Affiliation:** Beijing Jiaotong University, China |
| SE0059 | **Title:** Optimal Design Method of LLC-DAB Hybrid Bidirectional DC-DC Converter Based on Multi-objective Particle Swarm Optimization<br>**Author(s):** Yuefeng Liao, Jing Liang, Duo Yang, Ke Chen, Junjun Li, Yu Yan<br>**Presenter:** Yuefeng Liao<br>**Affiliation:** Zhengzhou University, China |
| SE0101 | **Title:** DC Fault Control for an HVDC Transmission System Protection Based on Hybrid-MMC and High-Speed Switch<br>**Author(s):** Yaoxi Jiang, Zongxue Shao, Hongchun Shu<br>**Presenter:** Yaoxi Jiang<br>**Affiliation:** Kunming University of Science and Technology, China |

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| | SE0117 | **Title:** Parallel Control Strategy of Energy Storage Interface Converter Virtual DC Motor<br>**Author(s):** Na Zhi, Yan Zhao, Xu Ming, Yawei An, Linjie Zhang, Hui Zhang<br>**Presenter:** Yan Zhao<br>**Affiliation:** Xi 'an University of Technology, China |
| | SE0128 | **Title:** Analysis of power supply capacity of DC distribution network considering photovoltaic-storage power stations<br>**Author(s):** Luchang Li, Minxiao Han, Wenyuan Cao<br>**Presenter:** Luchang Li<br>**Affiliation:** North China Electric Power University, China |

# Session 11

**December 11, 2022**
**Time Zone: GMT+8**

**Topic: Energy storage technology and system 1| 新型电池设计与储能技术 1**
**Zoom 6 ID: 86947297263**
**Time: 11:00-12:45 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Prof. Yan Ma, Jilin University, China;**
**Dr. Khadim Ullah Jan, Université Paris-Saclay, France**

**ORAL**

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| SE0182 | **Title:** User-side Energy Storage Planning Method Considering Different Billing Methods of Basic Electricity Price<br>**Author(s):** Lili Wen, Xianqi Shao, Yuan Zhu, Bo Li, Jiaxin Zhou, Caoyang Cheng, Mingxu Xiang<br>**Presenter:** Caoyang Cheng<br>**Affiliation:** Chongqing University, China |
| SE0208 | **Title:** Reinforcement learning-based energy optimization for a fuel cell electric vehicle<br>**Author(s):** Shengyan Hou, Xuan Liu, Hai Yin, Jinwu Gao<br>**Presenter:** Shengyan Hou<br>**Affiliation:** Jilin University, China |
| SE0110-A | **Title:** Multi-fault Diagnosis for Lithium-ion Battery Systems Using Model-based and Statistical Methods<br>**Author(s):** Kai Zhang<br>**Presenter:** Kai Zhang<br>**Affiliation:** Chongqing University, China |
| SE0253 | **Title:** An Improved Multilayer State of Charge Balancing Control Strategy for the Cascaded H-Bridge-Based Battery Energy Storage System<br>**Author(s):** Huiqiao Liu, Qian Xiao, Haolin Yu, Sen Tian, Weiliang Wang, Chunyu Tian, Yunfei Mu, Hongjie Jia<br>**Presenter:** Qian Xiao<br>**Affiliation:** Tianjin University, China |
| SE0119-A | **Title:** Distributed Energy Management of Home-Vehicle Nexus with Stationary Battery Energy Storage<br>**Author(s):** Xinchen Deng<br>**Presenter:** Xinchen Deng<br>**Affiliation:** Chongqing University, China |
| SE0098 | **Title:** Carbon Reduction Assessment of Electric Vehicle Aggregation Participating in Distribution Network Dispatching Based on V2G Technology<br>**Author(s):** Peng Zheng, Nuo Cheng, Xiaoyu Huang<br>**Presenter:** Zhenyao Huang<br>**Affiliation:** Fuzhou University, China |

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| | SE0125-A | **Title:** Capacity Degradation Analysis of Lithium-Ion Battery Packs for a Large Number of On-Road Electric Vehicles<br>**Author(s):** Hongao Liu, Zhongwei Deng, Xiaosong Hu<br>**Presenter:** Hongao Liu<br>**Affiliation:** Chongqing University, China |

# Session 12

**December 11, 2022**
**Time Zone: GMT+8**

**Topic: Energy internet and cyber resilience 1| 能源互联网与信息网络弹性 1**
**Zoom 3 ID: 87069632470**
**Time: 11:00-12:30 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Prof. Lei Ding, Nanjing University of Posts and Telecommunications, China**

**ORAL**

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| **SE0473** | **Title:** WCGAN-Based Cyber-Attacks Detection System in the EV Charging Infrastructure<br>**Author(s):** Manoj Basnet and Mohd. Hasan Ali<br>**Presenter:** Manoj Basnet<br>**Affiliation:** The University of Memphis , USA |
| **SE0299** | **Title:** Q-Learning Algorithm Enabled Topology Control Scheme in Power Line Communication Networks<br>**Author(s):** Lin Liu, Libin Zheng and Yusi Wang<br>**Presenter:** Lin Liu<br>**Affiliation:** State Grid Dalian Electric Power Supply Company, China |
| **SE0007** | **Title:** Node Trusted Computing Mechanism Design and Application under the Main-side Blockchain Architecture<br>**Author(s):** Jiani Xiang, Jianli Zhao, Suming Chen, Bing Wang and Yuquan Chen<br>**Presenter:** Suming Chen<br>**Affiliation:** Hohai University, China |
| **SE0435** | **Title:** Risk Asessment of Wind Power Integated AD/DC Hybrid Power System Based on Nonsequential Monte Calo Method<br>**Author(s):** Peng Xu, Fuqiang Li and Wei Zhao<br>**Presenter:** Peng Xu<br>**Affiliation:** North China Branch of State Grid Corportion of China, China |
| **SE0075** | **Title:** Simulation Analysis of the Lattice Boltzmann Method for the Bouncing Behavior of Highly Randomly Distributed Droplets on Rough Surfaces<br>**Author(s):** Sirui Lu, Hao Lu, Ke Luo, Yanmin Zhang, Zongyao Wang, Meifang Bai, Yongxia Liu<br>**Presenter:** Sirui Lu<br>**Affiliation:** Xinjiang University, China |
| **SE0017-A** | **Title:** Research on AGC full life cycle operation security assurance system based on Trusted Computing<br>**Author(s):** Shuai Cao, Xin Wu and Xing Chang<br>**Presenter:** Chang xing<br>**Affiliation:** Shenyang Institute of Computing Technology Co.Ltd.,CAS, China |

# Session 13

**December 11, 2022**
**Time Zone: GMT+8**

**Topic: Forecasting of renewable energy and power demand 1 | 负荷与可再生能源预测 1**
**Zoom 4 ID: 83118449166**
**Time: 11:00-12:30 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Dr. Guangchun Ruan, The University of Hong Kong, China**

**ORAL**

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| SE0041 | **Title:** Shared charging scheme design based on the impact of EV load on the actual distribution network<br>**Author(s):** Meixia Zhang, Lingxiao Gao and Xiu Yang<br>**Presenter:** Meixia Zhang<br>**Affiliation:** Shanghai Electric Power University, China |
| SE0258 | **Title:** A Hybrid VMD-based ARIMA-LSTM Model for Day-Ahead PV Prediction and Uncertainty Analysis<br>**Author(s):** Jingxian Yang, Tao Wu, Kai Wang and Run Wen<br>**Presenter:** Jingxian Yang<br>**Affiliation:** Northwest Minzu University, China |
| SE0457 | **Title:** Carbon price prediction of LSTM method based on attention mechanism<br>**Author(s):** Xiaohu Luo, Runxin Yu, Yuchen Guo, Heping Jia and Dunnan Liu<br>**Presenter:** Guo Yuchen<br>**Affiliation:** North China Electric Power University, China |
| SE0507 | **Title:** Ultra-short-term Probability Prediction Method of Photovoltaic Power Considering Satellite Image<br>**Author(s):** Zijie Zhou, Xuemin Zhang, Cunhao Zhu, Zhi Li, Zheng Li and Haiyan Tang<br>**Presenter:** Xuemin Zhang<br>**Affiliation:** Tsinghua University, China |
| SE0033 | **Title:** Prediction of Line Loss Rate in Power Supply Area Based on Grey Wolf Algorithm Optimized Support Vector Machine<br>**Author(s):** Fu Hui, Shi Mingming, Li Shuangwei, Fei Juntao and Wang Haoyu<br>**Presenter:** Haoyu Wang<br>**Affiliation:** Nanjing Institute of Technology, China |
| SE0488 | **Title:** Distributed Fusion Short-Term Load Forecasting Based on Machine Learning in Integrated Energy System<br>**Author(s):** Meng Xu, Xinli Wang, Lei Wang, Ruiqi Wang and Xiaohong Yin<br>**Presenter:** Meng Xu<br>**Affiliation:** Shandong university, China |

# Session 14

**December 11, 2022**
**Time Zone: GMT+8**

**Topic: Forecasting of renewable energy and power demand 2 | 负荷与可再生能源预测 2**
**Zoom 5 ID: 815 9467 4058**
**Time: 11:00-12:30 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Prof. Dazhi Yang, Harbin Institute of Technology, China**

**ORAL**

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| **SE0341** | **Title:** An Ultra-Short-Term and Short-Term Wind Power Forecasting Approach Based on Optimized Artificial Neural Network with Time Series Reconstruction<br>**Author(s):** Lihan Zha and Dongxiang Jiang<br>**Presenter:** Lihan Zha<br>**Affiliation:** Tsinghua University, China |
| **SE0020-A** | **Title:** Sparse Variational Gaussian Process Based Day-Ahead Probabilistic Wind Power Forecasting<br>**Author(s):** Honglin Wen, Jinghuan Ma, Jie Gu, Lyuzerui Yuan and Zhijian Jin<br>**Presenter:** Honglin Wen<br>**Affiliation:** Shanghai Jiao Tong University, China |
| **SE0053** | **Title:** Short-Term Wind Power Output Prediction Based on Temporal Graph Convolutional Networks<br>**Author(s):** Xiaoqing Ji, Zhaoxia Li, Xiaoyan Jiang and Dechang Yang<br>**Presenter:** Xiaoqing Ji<br>**Affiliation:** China Agricultural University, China |
| **SE0109** | **Title:** Solar Power Forecasting Based on Numerical Weather Prediction and Physical Model Chain for Day-ahead Power System Dispatching<br>**Author(s):** Wenting Wang, Yufeng Guo, Dazhi Yang and Jan Kleissl<br>**Presenter:** Wenting Wang<br>**Affiliation:** Harbin Institute of Technology, China |
| **SE0131** | **Title:** Firm Photovoltaic Generation through Battery Storage, Overbuilding, and Proactive Curtailment<br>**Author(s):** Guoming Yang, Dazhi Yang, Chao Lyu and Jan Kleissl<br>**Presenter:** Guoming Yang<br>**Affiliation:** Harbin Institute of Technology, China |
| **SE0249** | **Title:** Comparison and evaluation of multiple neural network models in wind power generation forecasting<br>**Author(s):** Junlai Luo, Junhong Hao, Yunxi Yang, Feng Hong, Xingce Wang and Zhihua Ge<br>**Presenter:** Feng Hong<br>**Affiliation:** North China Electric Power University, China |

# Session 15

**December 11, 2022**
**Time Zone: GMT+8**

**Topic: High-voltage and insulation technology 1 | 高电压与绝缘技术 1**
**Zoom 1 ID: 82273564217**
**Time: 11:00-12:30 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Dr. Hadi Nabipour Afrouzi, Swinburne University of Technology, Malaysia**

**ORAL**

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| SE0477 | **Title:** Calculation of Temperature Distribution for 500 kV MOA under Damp Fault<br>**Author(s):** Jingzhang Peng, Zaihua Zhang, Fengliang Wu, Bo Liu, Yue Shen and Jiatong Zhang<br>**Presenter:** Jiatong Zhang<br>**Affiliation:** China Three Gorges University, China |
| SE0414 | **Title:** A New Monitoring Method for the Dynamic Stray Current Intrusion of Subways<br>**Author(s):** Fengge Yang, Yue Liu, Jianlin Rao, Shuyu Li, Zixuan Liu and Zhuohong Pan<br>**Presenter:** Zhuohong Pan<br>**Affiliation:** North China Electric Power University, China |
| SE0476 | **Title:** Analysis on lightning strike characteristics of typical dense transmission channels<br>**Author(s):** Wenfeng Zhang, Chao Yang, Shuhong Yang, Jiangtao Liang, Chuntian Zhou and Shuaichao Li<br>**Presenter:** Shuaichao Li<br>**Affiliation:** China Three Gorges University, China |
| SE0228 | **Title:** Research on Lightning Interference Protection for HVDC Large-span Transmission Lines<br>**Author(s):** Yashan Hu, Qun Zhang, Yan Li, Qingshan Wang, Decheng Wang and Haibo Xi<br>**Presenter:** Yashan Hu<br>**Affiliation:** State Grid Jiangsu Economic Research Institute, China |
| SE0311 | **Title:** A Multi-physical field coupling model and analysis of partial discharge on PI insulations under high-frequency voltages<br>**Author(s):** Bilal Iqbal Ayubi, Zhang Li, Huangkuan Xu and Fan Chenlu<br>**Presenter:** Bilal Iqbal Ayubi<br>**Affiliation:** Shandong University, China |
| SE0480 | **Title:** Corrosion Detection Simulation of Reinforced Concrete Structure for Power Transmission and Transformation Based on Microwave Transmission Method<br>**Author(s):** Shenhua Wang, Yunguo Yang, Xuhua Ying, Jun Lin, Jianhong Jiang and Boming Zhang<br>**Presenter:** Boming Zhang<br>**Affiliation:** China Three Gorges University, China |

# Session 16

**December 11, 2022**
**Time Zone: GMT+8**

**Topic: Modeling and control of distributed energy sources 1 | 分布式能源及优化控制 1**
**Zoom 7 ID: 899 5509 2559**
**Time: 11:00-11:55**

**POSTER**

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| **SE0335** | **Title:** Circuit Analogy Modeling and Co-Optimization of Energy-Layer and Operating Parameters-Layer of DIES with HCNG<br>**Author(s):** Jing Chen and Bo Sun<br>**Presenter:** Jing Chen<br>**Affiliation:** Shandong university, China |
| **SE0261** | **Title:** Modeling and Simulation of Offshore Oil and Gas Platform AC/DC Hybrid Microgrid<br>**Author(s):** Liuming Jing, Tong Zhao, Yibo Wang and Jinghua Zhou<br>**Presenter:** Tong Zhao<br>**Affiliation:** North China University of Technology, China |
| **SE0327** | **Title:** Bi-level Optimal Design of Integrated Energy System with Synergy of Renewables, Conversion, Storage and Demand<br>**Author(s):** Lizhi Zhang, Bo Sun and Fan Li<br>**Presenter:** Lizhi Zhang<br>**Affiliation:** Shandong university, China |
| **SE0430** | **Title:** Optimal Scheduling for Micro Energy Grid Considering Practical Network Constraints and Quality–quantity Regulation<br>**Author(s)**: Wanxin Xu, Haonan Sun, Nian Liu<br>**Presenter:** Wanxin Xu<br>**Affiliation:** North China Electric Power University, China |
| **SE0336** | **Title:** Optimal Operation of Near-Zero Carbon Integrated Energy System with Efficient Hydrogen Production<br>**Author(s):** Yue Zhang, Bo Sun, Haoran Li and Jing Chen<br>**Presenter:** Yue Zhang<br>**Affiliation:** Shandong university, China |
| **SE0434** | **Title:** Research on Smart Onshore Charging Facilities with Mutual Aid Function to Consume Renewable Energy<br>**Author(s):** Haifeng Liu, Feng Lu, Songsong Zheng, Chaoyun Xiao, Peixiang Zhou, Qin Xue<br>**Presenter:** Chaoyun Xiao<br>**Affiliation:** Beijing Hestar Technology Co., Ltd., China |

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| | **SE0461** | **Title:** Two-stage Dual-loop Optimal Control Strategy Based on Model Predictive Control for Integrated Energy Systems<br>**Author(s):** Xing Dong, Chao Jiang, Bo Sun<br>**Presenter:** Xing Dong<br>**Affiliation:** Shandong University, China |
| | **SE0086** | **Title:** A Unified Control Strategy for Multimode Operation of Distributed Generation and Battery Energy Storage Integrated UPQC<br>**Author(s):** Li Yang, Xiaojun Zhao, Chunjiang Zhang, Zhide Zhao, Zehui Zhang, Xiaohuan Wang<br>**Presenter:** Li Yang<br>**Affiliation:** YanShan University, China |
| | **SE0039** | **Title:** Research of the reactive-voltage characteristics for Long-distance offshore wind power clusters via flexible HVDC transmission<br>**Author(s):** Yi Liu, Zhanjiang Li, Wei Cheng, Yinuo Li, Dongyu Peng, Yinhe Chu, Peng Tang, Bin Liu<br>**Presenter:** Yi Liu<br>**Affiliation:** Shandong university, China |
| | **SE0481** | **Title:** Multi-objective Optimal Configuration Scheme of Energy Storage in Wind-Photovoltaic-Energy Storage Hybrid Distribution Network System<br>**Author(s):** Jingda Gu, Baotong Song, Ning Su, Xiaohui Bai, Wei Li, Rui Zhao, Zixun Pan, Jiaben Dou, Yilan Ma, Jianfeng Chi, Zhiming Jiang, Xiaofeng Yang<br>**Presenter:** Xiaofeng Yang<br>**Affiliation:** Beijing Jiaotong University, China |
| | **SE0326** | **Title:** Double-loop Optimization Dispatch Strategy Considering Dynamic and Static Characteristics<br>**Author(s):** Zhicheng Wei, Fan Li and Bo Sun<br>**Presenter:** Zhicheng Wei<br>**Affiliation:** Shandong university, China |

# Session 17

**December 11, 2022**
**Time Zone: GMT+8**

**Topic: Electricity demand and load forecasting, energy internet and network security | 电力需求与负荷预测、能源互联网与网络安全**
**Zoom 7 ID: 899 5509 2559**
**Time: 11:55-12:45**

**POSTER**

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| **SE0156** | **Title:** Correlation Analysis Between Power Grid Investment Cost and Load Curve Characteristics<br>**Author(s):** Yuxu Deng, Xu Luo, Yongting Wang, Lili Wen, Yixin Zou, Zhonghao Li, Xingyu Lei<br>**Presenter:** Zhonghao Li<br>**Affiliation:** Chongqing University, China |
| **SE0521** | **Title:** Vulnerability analysis and evaluation of nodes in cyber-physical power systems under the framework of blockchain<br>**Author(s):** Ziying Wang, Liming Wang, Haitao Jiang, Wei Huang and Jiang Zhu<br>**Presenter:** Jiang Zhu<br>**Affiliation:** Electric Power Research Institute, State Grid Jiangsu, China |
| **SE0044** | **Title:** Research on power load characteristics of power users based on deep confidence network<br>**Author(s):** Zhifeng Zhou, Xiaoyao Yin, Jingwen Du and Kailin He<br>**Presenter:** Peihao Yang<br>**Affiliation:** Xi'an Thermal Engineering Research Institute Co., Ltd., China |
| **SE0197** | **Title:** Stackelberg Game of Electricity Retailer Based on Demand Response<br>**Author(s):** Jian Zheng, Junfang Zhang, Yue Bi, Xiaomin Zhong, Kaiwen Zhu and Luyue Wang<br>**Presenter:** Jian Zheng<br>**Affiliation:** Nanjing University of Science and Technology, China |
| **SE0037** | **Title:** Research on Information Assets Security Management of Electric Power Enterprise based on Cloud Edge Collaboration Technology<br>**Author(s):** Zhang Chunmei, Duan Lijuan, Xu Xingque and Liu Silin<br>**Presenter:** Chunmei Zhang<br>**Affiliation:** Zhongshan Power Supply Bureau of Guangdong Power Grid Co., Ltd, China |
| **SE0318** | **Title:** Analysis of Voltage Violation Based on Extreme Value Theory<br>**Author(s):** Liwen Sun, Han Wu and Na Meng<br>**Presenter:** Liwen Sun<br>**Affiliation:** Nanjing Institute of Technology, China |
| **SE0159** | **Title:** Bi-level Modeling of Cyber-Attacks Induced Severe Line Overloads<br>**Author(s):** Zhiwei Chen, Min Du, Yuangang Zhou<br>**Presenter:** Zhiwei Chen<br>**Affiliation:** Hunan University, China |

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| | SE0280 | **Title:** Full Electric Kitchen and its Electricity Safety Supervision<br>**Author(s):** Hua Guanghui, Sun Mengmeng, Li Feng, Liu Haixuan, Ye Rongbo and Zhang Xiangwen<br>**Presenter:** Hua Guanghui<br>**Affiliation:** CEPRI, China |
| | SE0035 | **Title:** Short-Term Photovoltaic Power Combination Forecasting Method with Time-Varying Weights<br>**Author(s):** Baodan Cui, Lin Ye, Zhuo Li, Yadi Luo, Yijun Yu and Xuri Song<br>**Presenter:** Cui Baodan<br>**Affiliation:** China Agricultural University, China |
| | SE0162 | **Title:** Time-of-Use Electricity Pricing Optimization Considering Investment Savings of Power System<br>**Author(s):** Qianwen Zhu, Wenzuo Tang, Lanxin Wang, Duyang Xie, Di Pan, Zhonghao Li and Xinxin Fang<br>**Presenter:** Zhonghao Li<br>**Affiliation:** ChongQing University, China |

# Session 18

**December 11, 2022**
**Time Zone: GMT+8**

**Topic: Artificial intelligence in power systems 1| 人工智能在电力系统的应用 1**
**Zoom 8 ID: 86964064559**
**Time: 11:00-12:00**

**POSTER**

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| | **SE0312** | **Title:** Power System Load Node Classification Based on Deep Belief Networks and Support Vector Machines<br>**Author(s):** Xiaoxiang Sun, Tong Li, Yunxu Hu, Ning Mi, Hailiang Zhong and Wenan Lu<br>**Presenter:** Wenan Lu<br>**Affiliation:** Tsinghua University; Hohai University, China |
| | **SE0120** | **Title:** Data-driven Fault Detection and Cause Identification Method for Distribution Systems<br>**Author(s):** Shuo Liu, Hao Liu and Tianshu Bi<br>**Presenter:** Shuo Liu<br>**Affiliation:** North China Electric Power University, China |
| | **SE0148** | **Title:** Research on Edge Diagnosis Method of UHVDC Commutation Failure Based on LSTM Neural Network<br>**Author(s):** Bin Yu, Tongwen Wang, Min Xie, Hui Sun, Peng Wang, Feng Jiang and Huafeng Xiao<br>**Presenter:** Feng Jiang<br>**Affiliation:** Southeast University, China |
| | **SE0186** | **Title:** Fault line selection and location of distribution network based on improved random forest method<br>**Author(s):** Ru Jiaxin, Luo Guomin, Shang Boyang, Luo Simin, Liu Wenlin and Wang Shaoliang<br>**Presenter:** Jiaxin Ru<br>**Affiliation:** Beijing JiaoTong University, China |
| | **SE0222** | **Title:** Distribution Network Topology Identification With Graph Transformer Neural Network<br>**Author(s):** Zixuan Zhao, Ji Qiao, Jiateng Li, Mengjie Shi and Xiaohui Wang<br>**Presenter:** Zixuan Zhao<br>**Affiliation:** China Electric Power Research Institute, China |
| | **SE0415** | **Title:** Attention-based Multiscale Context Awareness Network for Insulator Defect Detection<br>**Author(s):** Junting Zeng, Xinshan Zhu, Bin Li, Zhimin Guo, Yangyang Tian and Shaoguang Yuan<br>**Presenter:** Junting Zeng<br>**Affiliation:** Tianjin University, China |

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| | SE0423 | **Title:** On-line Verification Method of Backup Protection Under Extreme Operation Mode Based on Convolutional Neural Network<br>**Author(s):** Kangjie Ren, Yi Zou and Yinhong Li<br>**Presenter:** Kangjie Ren<br>**Affiliation:** Huazhong University of Science and Technology, China |
| | SE0460 | **Title:** Single-phase grounding fault type identification of distribution network based on LSTM<br>**Author(s):** Shifeng Ou, Liwen Qin, Kewen Li, Zhengxiong Zhang and Wei Zhang<br>**Presenter:** Boyang Shang<br>**Affiliation:** Beijing Jiaotong University, China |
| | SE0493 | **Title:** Research on Temperature and Humidity Prediction Model of High Voltage Switchgear Based on SSA-BP Algorithm<br>**Author(s):** Genqiang Shen, Longchao Zhang, Jiyun Zhu, Min Xu, Mengzhou Zhu and Pei Chong<br>**Presenter:** Pei Chong<br>**Affiliation:** China Three Gorges University, China |
| | SE0468 | **Title:** Data-Driven Physics based Ultra-short-term Wind Power Prediction Model: A VMD-LSTM and WRF based Approach<br>**Author(s):** Xiyou Cui, Hongwei Li, Zhiyuan Pan and Zhengmao Zhang<br>**Presenter:** Hongwei Li<br>**Affiliation:** State Grid of China Technology College, China |
| | SE0416 | **Title:** Progressive Feature Fusion and Refinement Network for Substation Rotating Object Detection<br>**Author(s):** Luyao Qu, Xinshan Zhu, Bin Li, Zhimin Guo, Hao Liu and Wandeng Mao<br>**Presenter:** Luyao Qu<br>**Affiliation:** Key Laboratory of Smart Grid of Ministry of Education, Tianjin University, China |
| | SE0082 | **Title:** Sequence Impedance Model Identification of Grid-connected Inverter Based on RBF Neural Network under Weak Network<br>**Author(s):** Fei Li, Shuiliang Cai, Yingfeng Wang, Mingyao Ma and Xing Zhang<br>**Presenter:** Shuiliang Cai<br>**Affiliation:** Hefei University of Technology, China |

# Session 19

**December 11, 2022**
**Time Zone: GMT+8**

**Topic: Modeling and control of distributed energy sources 2 | 分布式能源及优化控制 2**
**Zoom 6 ID: 86947297263**
**Time: 15:45-18:30 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Assoc. Prof. Junhong Hao, North China Electric Power University, China**

**ORAL**

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| | ACTIONPOWER | **Title:** Technical requirements and examples for grid connection technology of energy storage system<br>**Presenter:** Haigang Han<br>**Affiliation:** Xi'an ACTIONPOWER Electric Co.,Ltd., China |
| | SE0270 | **Title:** A Novel Isolated Medium Voltage Inverter for Energy Storage Application<br>**Author(s):** Han Zhang, Gang Liu, Senyu Du, Xiaoqiang Guo, Zhe Zhang and Changchun Hua<br>**Presenter:** Han Zhang<br>**Affiliation:** Yanshan University, China |
| | SE0189 | **Title:** Analysis and Simulation of Minimums of Short Circuit Ratio for Phase-Locked Loop Based Synchronization Stability of Parallel Connected Voltage Source Converters<br>**Author(s):** Chaobo Dai, Xiaoge Liu, Zhanfeng Deng, Huazhong Sun, Juanjuan Wang, Fengshuo Li<br>**Presenter:** Chaobo Dai<br>**Affiliation:** State Grid Smart Grid Research Institute Co., Ltd., China |
| | SE0271 | **Title:** Control and Stability Analysis for Grid-Connected Current Source Inverter with Digital Delay<br>**Author(s):** Senyu Du, Weijian Chen, Xiaoqiang Guo, Zhe Zhang, Lichong Wang, and Josep M. Guerrero<br>**Presenter:** Senyu Du<br>**Affiliation:** Yanshan University, China |
| | SE0453 | **Title:** Microgrid Fault Analysis Method Based on Inverter-Type DG with Different Control<br>**Author(s):** Jiaqing Wang, Jiayin Xu, Wei Huang, Jia Tian, Qing Liu, Yusheng Kuai, Xuli Wang, Kai Xia and Rao Shi<br>**Presenter:** Kai Xia<br>**Affiliation:** East China Electric Power Design Institute Co., Ltd of China Power Engineering Consulting Group, China |
| | SE0272 | **Title:** A High-Voltage Gain Transformerless Grid-Connected Inverter<br>**Author(s):** Yupeng Wei, Xiaoqiang Guo, Zhe Zhang , Lichong Wang and Josep M. Guerrero<br>**Presenter:** Yupeng Wei<br>**Affiliation:** Yanshan University, China |

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| | **SE0300** | **Title:** Positive and Negative Sequence Components Separation Control Method for PV Inverters Based on Second-order Generalized Integrator<br>**Author(s):** Haoran Song, Houlei Gao, Fang Peng and Bin Xu<br>**Presenter:** Haoran Song<br>**Affiliation:** Shandong University, China |
| | **SE0483** | **Title:** Current Sharing Control Method for Parallel Three-Level Inverters Based on PSST Strategy<br>**Author(s):** Mingxue Li, Kai Wang, Dongsheng Yu<br>**Presenter:** Mingxue Li<br>**Affiliation:** China University of Mining and Technology, China |
| | **SE0273** | **Title:** Improved PSO-SVM-Based Fault Diagnosis Algorithm for Wind Power Converter<br>**Author(s):** Hao Zhang, Xiaoqiang Guo and Pinjia Zhang<br>**Presenter:** Hao Zhang<br>**Affiliation:** Yanshan University, China |
| | **SE0447** | **Title:** Research on Current Differential Sampling Accuracy Based on Solid State Electronic Switch<br>**Author(s):** Li Huiyao, Wang Li, Deng Xiaobin, Wang Jie, Ren Liang, Shi Junbiao<br>**Presenter:** Li Huiyao<br>**Affiliation:** Beijing Space Power Conversion and Control Engineering Research Center, China |
| | **SE0279** | **Title:** A Novel Three-Phase Multilevel Converter for Medium Voltage Application<br>**Author(s):** Shiqi Zhang, Yupeng Wei, Xiaolei Hu, Xiaoqiang Guo, Lichong Wang and Josep M. Guerrero<br>**Presenter:** Shiqi Zhang<br>**Affiliation:** Yanshan University, China |

# Session 20

**December 11, 2022**
**Time Zone: GMT+8**

**Topic: Energy storage technology and system 2| 新型电池设计与储能技术 2**
**Zoom 3 ID: 87069632470**
**Time: 15:45-18:15 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Assoc. Prof. Xiaofeng Yang, Beijing Jiaotong University, China**

**ORAL**

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| **SE0385** | **Title:** Probabilistic Prediction of Remaining Useful Life of Lithium-ion Batteries<br>**Author(s):** Renjie Zhang, Jialin Li, Yifei Chen, Shiyi Tan, Jiaxu Jiang and Xinmei Yuan<br>**Presenter:** Renjie Zhang<br>**Affiliation:** Jilin university, China |
| **SE0021-A** | **Title:** State of charge estimation for lithium-ion batteries using gated recurrent unit recurrent neural network and adaptive Kalman filter<br>**Author(s):** Junxiong Chen, Qiao Zhu<br>**Presenter:** Junxiong Chen<br>**Affiliation:** Southwest Jiaotong University, China |
| **SE0140** | **Title:** Design of an Active Equalization Scheme with a Modified Circuit and SOC Estimation-Based EKPF<br>**Author(s):** Xiaofei Liu, Hui Pang, Yuanfei Geng, Longxing Wu<br>**Presenter:** Xiaofei Liu<br>**Affiliation:** Xi'an university of technology, China |
| **SE0085** | **Title:** Lithium-Ion Battery Online Capacity Diving Multi-level Evaluation and Early Warning Method Based on State of Nonlinear Aging<br>**Author(s):** Heze You, Jiangong Zhu, Xueyuan Wang, Bo Jiang, Xuezhe Wei, Haifeng Dai<br>**Presenter:** Haifeng Dai<br>**Affiliation:** Tongji University, China |
| **SE0106-A** | **Title:** Auto feature extraction enabled capacity estimation of lithium-ion battery based on a universal model<br>**Author(s):** Ziyou Zhou, Yonggang Liu, Mingxing You, Rui Xiong, Xuan Zhou<br>**Presenter:** Ziyou Zhou<br>**Affiliation:** Chongqing University, China |
| **SE0116** | **Title:** An Overview of Peak Power Benchmark Methods for Lithium-Ion Battery<br>**Author(s):** Yunteng Dai, Jinhao Meng, Qiao Peng, Tianqi Liu, Yongxiang Cai, Congcong Wu<br>**Presenter:** Yunteng Dai<br>**Affiliation:** Sichuan University, China |

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| | **SE0130-A** | **Title:** Extreme Fast Charging of Energy-dense Lithium-ion Batteries at All Climates<br>**Author(s):** Xiao-Guang Yang, Wenke Zhang, Shuaibang Liu<br>**Presenter:** Xiao-Guang Yang<br>**Affiliation:** Beijing Institute of Technology, China |
| | **SE0132** | **Title:** An Improved Battery Equalizer Based on Current Curve Optimization<br>**Author(s):** Ao You, Runmin Zou, Fulin Liu<br>**Presenter:** Runmin Zou<br>**Affiliation:** Central South University, China |
| | **SE0065** | **Title:** Health Prognostics for Lithium-ion Battery Based on Hybrid Data-driven Method<br>**Author(s):** Yan Ma, Ce Shan, Yunfeng Hu, Hong Chen<br>**Presenter:** Yan Ma<br>**Affiliation:** Jilin University, China |
| | **SE0233** | **Title:** Data-driven SOH Estimation of Lithium-ion Batteries Based on Savitzky-Golay Filtering and SSA-SVR Model<br>**Author(s):** Lulu Wang, Xiaoming Wang, Yuting Hua, Hongbin Wu, Chao Pan and Hongyun Fu<br>**Presenter:** Lulu Wang<br>**Affiliation:** Hefei University of Technology, China |

# Session 21

**December 11, 2022**
**Time Zone: GMT+8**

**Topic: Energy storage technology and system 3| 新型电池设计与储能技术 3**
**Zoom 4 ID: 83118449166**
**Time: 15:45-18:15 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Prof. Gheorghe Grigoras, Gheorghe Asachi Technical University, Romania**

**ORAL**

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| SE0151 | **Title:** A Novel State-of-Charge Estimation Method for Lithium-ion Batteries Using Convolutional Transformer Network and Sigma-point Kalman Filter<br>**Author(s):** Yuxin Duan, Runmin Zou<br>**Presenter:** Runmin Zou<br>**Affiliation:** Central South University, China |
| SE0174 | **Title:** Study on Consistency Sorting Method of Lithium-ion Battery<br>**Author(s):** Sihan Liu, Wei Sun, Dong Jiang, Bingxiang Sun<br>**Presenter:** Sihan Liu<br>**Affiliation:** Huazhong University of Science and Technology, China |
| SE0180 | **Title:** Battery Capacity Trajectory Prediction with Multi-output Gaussian Process<br>**Author(s):** Jinwen Li, Zhongwei Deng, Xiaosong Hu<br>**Presenter:** Jinwen Li<br>**Affiliation:** Chongqing University, China |
| SE0392 | **Title:** Economic Analysis of New Energy Storage for Large Industrial User-side<br>**Author(s):** Song Qing, Lei Pan, Heng Zhao, Tianwen Zheng, Kaijiang Cao, Tong Zhang and Shengwei Mei<br>**Presenter:** Lei Pan<br>**Affiliation:** Sichuan Energy Internet Research Institute, China |
| SE0484 | **Title:** A Multi-Attention Mechanisms Based Transfer Learning Framework for State of Health Estimation of Lithium-ion Battery<br>**Author(s):** Dong Lu, Naxin Cui and Changlong Li<br>**Presenter:** Dong Lu<br>**Affiliation:** Shandong university, China |
| SE0432 | **Title:** Parameter Identification of Fractional-order Model for Lithium-ion Batteries Via a Neighborhood Differential Evolution Algorithm<br>**Author(s):** Kunjie Yu, Yazhe Zhong, Duo Yang, Jing Liang, Yuefeng Liao<br>**Presenter:** Yang Duo<br>**Affiliation:** Zhengzhou University, China |
| SE0107-A | **Title:** Toward high-accuracy and high-efficiency battery electrothermal modeling: A general approach tackling modeling errors<br>**Author(s):** Wenxue Liu<br>**Presenter:** Wenxue Liu<br>**Affiliation:** Chongqing University, China |

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| | SE0485 | **Title:** Development and Application of Battery Management System for Storage System of the Auxiliary Power Unit of EMUs<br>**Author(s):** Hanxiao Liu, Yang Li, Bin Duan, Liwei Li<br>**Presenter:** Hanxiao Liu<br>**Affiliation:** Shandong University, China |
| | SE0193 | **Title:** Joint State of Charge and State of Health Estimation of Lithium-ion Battery Using Improved Adaptive Dual Extended Kalman Filter Based on Piecewise Forgetting Factor Recursive Least Squares<br>**Author(s):** Yawen Liang, Shunli Wang, Yongcun Fan, Xiao Yang, Yanxin Xie, Carlos Fernandez<br>**Presenter:** Yawen Liang<br>**Affiliation:** Southwest University of Science and Technology, China |
| | SE0060-A | **Title:** Reconfigurable Design of Battery Energy Storage Systems: From Architecture to Control<br>**Author(s):** Amir Farakhor, Huazhen Fang<br>**Presenter:** Amir Farakhor<br>**Affiliation:** University of Kansas, USA |

# Session 22

**December 11, 2022**
**Time Zone: GMT+8**

**Topic: Electricity demand and marketing | 电力需求与市场策略**
**Zoom 5 ID: 815 9467 4058**
**Time: 15:45-18:15 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Assoc. Prof. Haiwang Zhong, Tsinghua University, China**

**ORAL**

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| SE0161 | **Title:** Application of ALO-ELM on Electricity Demand Forecasting under Spot Power Market<br>**Author(s):** Yan Shi, Wenzhe Zhang, Fumin Sang, Lei Zhao and Tao Wang<br>**Presenter:** Wenzhe Zhang<br>**Affiliation:** State Grid Chongqing Electric Power Company, China |
| SE0489 | **Title:** The medium and long-term trading mode and variety design of Jiangxi new energy participating in electric power under the double carbon target<br>**Author(s):** Jiawei Gong, Qiangsheng Dai, Haoyong Chen, Yingxue Li, Quanhui Guo and Yushen Wang<br>**Presenter:** Yushen Wang<br>**Affiliation:** South China University of Technology, China |
| SE0330 | **Title:** Alleviation of Network Congestion in Aggregated Market Model Based on Areas Partitioning Concept and Rebound Effect<br>**Author(s):** Apinun Chenchod and Paramet Wirasanti<br>**Presenter:** Apinun Chenchod<br>**Affiliation:** Chaing Mai University, Thailand |
| SE0402 | **Title:** Research on Demand Side Response Strategy Considering Operation Flexibility of Thermal Storage Electric Boiler<br>**Author(s):** Beibei Sun, Peng Wang, Yiming Xue, Tian Chen, Yikun Chu, Huiling Li, Jie Wang, Ning Huang and Shiwei Xia<br>**Presenter:** Yikun Chu<br>**Affiliation:** North China Electric Power University, China |
| SE0019 | **Title:** Research on Development Path of China's Power Generation Capacity Market under Carbon Peaking and Carbon Neutrality Targets-Revelation from Experience of Typical Countries<br>**Author(s):** Zhuangzhuang Liu, Xueqin Tian, Tong Xu, Xinlei Wang, Haijing Zhang, Zhifan Liu and Xiaohui Liu<br>**Presenter:** Zhuangzhuang Liu<br>**Affiliation:** State Grid Economic and Technological Research Institute Co., Ltd., China |
| SE0181 | **Title:** A Flexible Resources Planning Method Based on Time-Series Operation Simulation<br>**Author(s):** Bo Li, Xianqi Shao, Yuan Zhu, Lili Wen, Jiaxin Zhou, Caoyang Cheng, Mingxu Xiang<br>**Presenter:** Caoyang Cheng<br>**Affiliation:** Chongqing University, China |

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| | **SE0069** | **Title:** Research On a Coordinated Charging Strategy For Multi Charging Station Considering User Waiting Loss<br>**Author(s):** Longlong Shang, Ran Hu, Xinming Li, Wei Sun, Yi Liu and Jun Jia<br>**Presenter:** Xinming Li<br>**Affiliation:** Jilin University, China |
| | **SE0508** | **Title:** Carbon Cost Pass-through Analysis Considering Renewable Energy Consumption<br>**Author(s):** Xinyan Su, Li Zhang, Hao Wang, Yuxi Wang and Shihang Song<br>**Presenter:** Xinyan Su<br>**Affiliation:** Key Laboratory of Power System Intelligent Dispatch and Control Shandong University, China |
| | **SE0321** | **Title:** Research on coordination between medium-long-term electricity trade and spot market trade<br>**Author(s):** Liangyuan Wang, Shuyuan Lin, Xiaomin Lin and Linyan Wang<br>**Presenter:** Linyan Wang<br>**Affiliation:** Fujian Electric Power Trading Center Co., Ltd., China |
| | **SE0034** | **Title:** Research on Power Quality Demand Analysis Model for Multi User by Integrated Neural Network<br>**Author(s):** Chen Bing, Luo Shanshan, Zhou Liyang and Hu Xuefeng<br>**Presenter:** Liyang Zhou<br>**Affiliation:** Nanjing Institute of Technology, China |

# Session 23

**December 11, 2022**
**Time Zone: GMT+8**

**Topic: Modern power system: stability and control 2| 新型电力系统稳定分析与控制 2**
**Zoom 1 ID: 82273564217**
**Time: 15:45-18:15 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Assoc. Prof. Lei Chen, Tsinghua University, China**

**ORAL**

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| **Hoteam** | **Title:** Analysis on power quality comprehensive optimization technology of distribution network<br>**Presenter:** Detao Wang (General Manager of R&D Center)<br>**Affiliation:** Shandong Hoteam Technology Group Co.,Ltd., China |
| **SE0134** | **Title:** Stability Control System for Power Grid Security Defense Level Improvement<br>**Author(s):** Jingjing Ruan, Peng Chen, Junnan Chen, Xiaotong Xu and Jian Zhang<br>**Presenter:** Jingjing Ruan<br>**Affiliation:** NARI Group Corporation (State Grid Electric Power Research Institute), China |
| **SE0316** | **Title:** Optimal Design of Multi-Machine Power System Damping Controller Using Neuro-Fuzzy Controller Based Stabilizer<br>**Author(s):** Aliyu Sabo, Noor Izzri Abdul Wahab and Mohammad Lutfi Othman<br>**Presenter:** Aliyu Sabo<br>**Affiliation:** Universiti Putra Malaysia (UPM) Serdang, Malaysia |
| **SE0387** | **Title:** Screening Index of Severe AC Faults in Multi-Infeed HVDC System Considering Electromagnetic Transient Process<br>**Author(s):** Ruanming Huang, Haoen Li, Xiaohui Wang, Fei Fei, Yunyi Yang, Xiaoyan Bian, Jianxian Ou, Hanrui Chen and Changhui Zhu<br>**Presenter:** Jianxian Ou<br>**Affiliation:** Shanghai University of Electric Power, China |
| **SE0286** | **Title:** Electromechanical Paramters Estimation of a Synchronous Generator Based on the Oscillation Charateristic Extraction<br>**Author(s):** Zhiwei Wang, Xiangyu Lyu, Dexin Li, Shishuai Zhu, Changhong Fu, and Bo Wang<br>**Presenter:** Shishuai Zhu<br>**Affiliation:** Northeast Electric Power University, China |
| **SE0214** | **Title:** Voltage Sag Evaluation Method and Control Strategy for Transmission and Distribution Integration<br>**Author(s):** Junjun Yang, Xianyu Zha, Wang Tu, Yinbao Zhang, Sun Helin, Zou Delong and Xuanyi Fu<br>**Presenter:** Junjun Yang<br>**Affiliation:** NARI Group Corporation (State Grid Electric Power Research Institute), China |

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| | **SE0217** | **Title:** Semi-Analytical Electromagnetic Transient Simulation Using Differential Transformation<br>**Author(s):** Min Xiong, Rui Yao, Yang Liu, Kai Sun and Feng Qiu<br>**Presenter:** Min Xiong<br>**Affiliation:** University of Tennessee Knoxville, United States |
| | **SE0252** | **Title:** Instance-based model-driven technique for online critical clearing time prediction for the modern power grid<br>**Author(s):** Ifedayo Oladeji, Ramon Zamora and Tek Tjing Lie<br>**Presenter:** Ifedayo Ramon Oladeji<br>**Affiliation:** AUT, New Zealand |
| | **SE0469** | **Title:** Mathematical model with IGBT power equipment for simulation modeling<br>**Author(s):** Zhiyu Lu, Maxim Popov G., Xiaoqiang Guo, Zhanyou Li, Uma Nanagia and Ning Wang<br>**Presenter:** Zhiyu Lu<br>**Affiliation:** Peter the Great St.Petersburg Polytechnic University, China |
| | **SE0502** | **Title:** Steady-State Initialization of AC-DC Grids with Complex Controllers for Transient Simulations<br>**Author(s):** Xiaoshan Wu, Ligang Zhao, Baorong Zhou, Chao Hong, Yinsheng Su and Sijia Tu<br>**Presenter:** Xiaoshan Wu<br>**Affiliation:** CSG ELECTRIC POWER RESEARCH INSTITUTE, China |

# Session 24

**December 11, 2022**
**Time Zone: GMT+8**

**Topic: Modeling and stability analysis of renewable energy system 2 | 新能源系统建模及稳定性分析 2**
**Zoom 7 ID: 899 5509 2559**
**Time: 15:45-16:30**

**POSTER**

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| SE0267 | **Title:** An Integrated MPPT Control Strategy Using Circle Search-Firefly Algorithm (CSFA) for Photovoltaic System<br>**Author(s):** Congcong Li, Chenyu Sun, Siqi Li and Yingying Zhang<br>**Presenter:** Congcong Li<br>**Affiliation:** Hefei University of Technology, China |
| SE0356 | **Title:** Effect of DC-Voltage Loop on Grid-Connected PV Inverter Stability Under Weak Grid<br>**Author(s):** Jiufa Zhong, Jinming Xu, Yiwen Shi and Shaojun Xie<br>**Presenter:** Jiufa Zhong<br>**Affiliation:** Nanjing University of Aeronautics and Astronautics, China |
| SE0384 | **Title:** Analysis Method for the Stable Operating Area in the Inverter-grid System<br>**Author(s):** Junliang Liu, Xiong Du, Yongtao Chen, Xing Ma, Hanlin Xia, Hang Zhan and Yuan Li<br>**Presenter:** Junliang Liu<br>**Affiliation:** Chongqing university, China |
| SE0393 | **Title:** FPGA Implementation of Real-Time Simulation Model of Wind Turbine Connected to Grid<br>**Author(s):** Yang Gao, Zheng Fan, Qiang Li, Lu Gao and Jiapei Zhou<br>**Presenter:** Yang Gao<br>**Affiliation:** State grid smart grid research institute Ltd, China |
| SE0036 | **Title:** Current Sharing Control Strategy of BFBIC-IPOP Photovoltaic DC Grid-Connected Converter<br>**Author(s):** Xuteng Wei, Yibo Wang, Yu Zhou, Huan Wang<br>**Presenter:** Xuteng Wei<br>**Affiliation:** University of Chinese Academy of Sciences, China |
| SE0104 | **Title:** Evaluation of Phase-Locked Loop Stability Considering Electromagnetic Transient Process<br>**Author(s):** Xiaoge Liu, Chaobo Dai, Zhichang Yang, Zhanfeng Deng, Guoliang Zhao<br>**Presenter:** Xiaoge Liu<br>**Affiliation:** State Grid Smart Grid Research Institute Co., Ltd, China |
| SE0185 | **Title:** Passivity Design for LCL-Type Grid-Tied Inverter Based on The Constraint of Realizing Passivity by Capacitor Current Control<br>**Author(s):** Shaojie Li, Hua Lin, Xingwei Wang, Tianyi Su, Yuanzhe Ren, Haojie Ding<br>**Presenter:** Shaojie Li<br>**Affiliation:** Huazhong University of Science and Technology, China |

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| | SE0328 | **Title:** Virtual Inertia Control and Identification Method of Inertia Parameters for Doubly-Fed Units<br>**Author(s):** Longzhen Yu, Xiaoxiang Sun, Tong Li, Hailiang Zhong, Ming Li and Yuqi Shao<br>**Presenter:** Longzhen Yu<br>**Affiliation:** Hohai University, China |
| | SE0257 | **Title:** Synchronization Stability Analysis and Fuzzy PI-based Control for Grid-Connected Inverter<br>**Author(s):** Yiwen Shi, Jinming Xu, Yuan Hu, Zihan Ling, Jiufa Zhong, Shaojun Xie<br>**Presenter:** Jiufa Zhong<br>**Affiliation:** Nanjing University of Aeronautics and Astronautics, China |

# Session 25

**December 11, 2022**
**Time Zone: GMT+8**

**Topic: Energy storage technology and system 4| 新型电池设计与储能技术 4**
**Zoom 7 ID: 899 5509 2559**
**Time: 16:30-17:30**

**POSTER**

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| SE0204 | **Title:** A Fusion Method of Series-Connected Batteries State-of-Health Estimation and Balancing Strategy Applied to Multi-Cell-to-Multi-Cell Equalizer<br>**Author(s):** Jing Zeng, Runmin Zou, Fulin Liu<br>**Presenter:** Runmin Zou<br>**Affiliation:** Central South University, China |
| SE0419 | **Title:** Support Vector Machine Based Lithium-ion Battery Electrolyte Leakage Fault Diagnosis Method<br>**Author(s):** Caiping Zhang, Pengfei Zhang, Yubin Wang, Linjing Zhang, Jing Hu, Weige Zhang<br>**Presenter:** Pengfei Zhang<br>**Affiliation:** Beijing Jiaotong University, China |
| SE0097 | **Title:** Performance Optimization of CsPbIBr2 Perovskite Solar Cells with Carbon Electrode<br>**Author(s):** Yichen Zhao, Caili Yu<br>**Presenter:** Yichen Zhao<br>**Affiliation:** Tarim University, China |
| SE0503 | **Title:** Capacity Optimal Allocation Strategy of Energy Storage System Based on Fruit Fly Optimization Algorithm<br>**Author(s):** Shaojiang Wu, Yi Wang, Kai Lin, Wanying Liao, Weiqin Huang<br>**Presenter:** Shaojiang Wu<br>**Affiliation:** Fujian Shuikou Power Generation, China |
| SE0072 | **Title:** Prediction of Battery Remaining Useful Life Based On Multi-dimensional Features and Machine Learning<br>**Author(s):** Zhuoyan Wu, Jun Jia, Yi Liu, Qi Qi, Likun Yin, Wei Xiao<br>**Presenter:** Jun Jia<br>**Affiliation:** Tsinghua Sichuan Energy Internet Research Institute, China |
| SE0445 | **Title:** Modeling and Simulation of Fuel Cell UAV Hybrid Power System<br>**Author(s):** Yuhui Ma, Zhendong Hua, Haifeng Wang, Cong Han, Yigeng Huangfu, Rui Ma<br>**Presenter:** Yuhui Ma<br>**Affiliation:** Chinese Flight Test Establishment, China |
| SE0099 | **Title:** Thermal Simulation for a 200 Ah Li\|\|Bi Liquid Metal Battery<br>**Author(s):** Yi Zhang, Zhenlin Guo, Yaling He, Min Zhou<br>**Presenter:** Yi Zhang<br>**Affiliation:** Huazhong University of Science and Technology, China |

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| | **SE0220** | **Title:** Spectral-ICA-Based Thermal Fault Detection for Large Format Lithium-ion Battery<br>**Author(s):** Jinhui Zhou, Wenjing Shen, Yu Zhou, Liqun Chen<br>**Presenter:** Liqun Chen<br>**Affiliation:** Shenzhen Technology University, China |
| | **SE0224** | **Title:** Research on Intelligent Online Operation and Maintenance System of 3D Visualization Hydrogen Production and Energy Storage Power Station<br>**Author(s):** DAI Dongyun, WANG Zheng, YOU Yimin, SANG Zhongqing, YUAN Huisheng, JIANG Weiyun<br>**Presenter:** WANG Zheng<br>**Affiliation:** Xiamen University of Technology, China |
| | **SE0234** | **Title:** Simultaneous Estimation of SOH and SOC of Batteries based on SVM<br>**Author(s):** Shu Sun, Qiongbin Lin, Huasen Li, Yin Zhan, Yanyan Dai<br>**Presenter:** Shu Sun<br>**Affiliation:** Fuzhou University, China |
| | **SE0022-A** | **Title:** Study On Fuel Cell Performance Degradation During Real Load Profiles Tests<br>**Author(s):** Weifeng Huang, Caizhi Zhang, Zuhang Fu<br>**Presenter:** Weifeng Huang<br>**Affiliation:** Chongqing University, China |
| | **SE0080** | **Title:** Suppressing Thermal Runaway of Lithium-ion Batteries by Using Insulation Material<br>**Author(s):** Zhuoyan Wu, Jun Jia, Likun Yin, Weidong Zhong, Zhe Kang, Zhuoyu Jiang<br>**Presenter:** Jun Jia<br>**Affiliation:** Tsinghua Sichuan Energy Internet Research Institute, China |

# Session 26

**December 11, 2022**
**Time Zone: GMT+8**

**Topic: Optimal management and control of smart grid 1 | 智能电网优化管理与运行控制 1**
**Zoom 7 ID: 899 5509 2559**
**Time: 17:30-18:25**

**POSTER**

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| SE0458 | **Title:** A cooperative game strategy considering the interaction of new energy and demand-side resources<br>**Author(s):** Chenhui Li, Ying Mu, Wanlei Xue, Xiaohu Luo and Yuchen Guo<br>**Presenter:** Guo Yuchen<br>**Affiliation:** North China Electric Power University, China |
| SE0373 | **Title:** Optimal Scheduling of Active/Reactive Power for Inverter Interfaced Distributed Generators during Voltage Sags<br>**Author(s):** Kai Sun, Jiamei Zhang, Canbing Li, Kan Feng and Pei Sun<br>**Presenter:** Jiamei Zhang<br>**Affiliation:** Hunan University, China |
| SE0056 | **Title:** Coordinated Transmission and Distribution Optimal Power Flow with Carbon Constraints<br>**Author(s):** Jiao Hao, Chen Jinming, Zhao Xindong, Guo Yajuan, Yang Yi and Huang Minghao<br>**Presenter:** Minghao Huang<br>**Affiliation:** Zhejiang University, China |
| SE0348 | **Title:** Research on the Benefit Evaluation Method of Green Energy Microgrid Construction and Equipment Access<br>**Author(s):** Fulong Song, Xiaoxiao Yu, Zichen Liu, Yihui Chen and Jun Wu<br>**Presenter:** Zichen Liu<br>**Affiliation:** Wuhan University, China |
| SE0173 | **Title:** A Two-layer Optimal Scheduling Strategy for Multiple Virtual Grids<br>**Author(s):** Jia Yongyong, An Haiyun, Zhu Xinyao and Li Zheng<br>**Presenter:** Haiyun An<br>**Affiliation:** Jiangsu Electric Power Company Research Institute State Grid Jiangsu Electric Power Co., Ltd, China |
| SE0213 | **Title:** Optimal Bi-Level Stochastic Energy Scheduling of Integrated Community Energy System<br>**Author(s):** Jinyong Dong, Qiuwei Wu, Jian Chen and Bo Pan<br>**Presenter:** Xiangya Bu<br>**Affiliation:** Shandong University, China |

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| | SE0516 | **Title:** Motif-assisted Grid-connected Microgrid Planning in the Low-voltage Distribution Network<br>**Author(s):** Lei Wang, Ke Sun, Fan Li, Mengxue Qi, Linjuehao Mei, Zhiyi Li<br>**Presenter:** Zhiyi Li<br>**Affiliation:** Zhejiang University, China |
| | SE0216 | **Title:** Energy-Efficient Distributed Clustering Algorithm for WSNs in Smart Grid<br>**Author(s):** Zhiyuan Liu, Huisan Wang, Xiuping Shi, Tianqi Li, Lei Shi, Liang Zhou, Jian Luo, Xinyang Zhao, Nan Cao, Yuanchao Huang and Xiangnan Du<br>**Presenter:** Huisan Wang<br>**Affiliation:** C-EPRI Electric Power Engineering Co. LTD, China |
| | SE0498 | **Title:** A Degraded Scheduling Algorithm for Thermal Power Units Based on Multiple Priority Queues<br>**Author(s):** Zhihui Liu, Yuchen Zhao, Boyu Zhou, Kai Yuan, Ye Tian, Liang Wang<br>**Presenter:** Ye Tian<br>**Affiliation:** BeiJing Institute of Technology, China |
| | SE0242 | **Title:** A Model-Data-Combined Identification Approach for Distribution Grid Line Parameter<br>**Author(s):** Jiateng Li, Ji Qiao, Zixuan Zhao, Xiaohui Wang, Mengjie Shi<br>**Presenter:** Jiateng Li<br>**Affiliation:** China Electric Power Research Institute, China |
| | SE0043 | **Title:** Renewable Energy Consumption and Economic Analysis of Renewable Energy and Thermal Power Combined Transmission System Considering Electric energy Storage Configuration<br>**Author(s):** Zesen Wang, Qi Li, Kai Bai, Jinzhi Guo, Zhe Wang, Yinglin Liu<br>**Presenter:** Qi Li<br>**Affiliation:** Electric Power Research Institute State Grid Jibei Electric Power Company Limited, China |

# Session 27

**December 11, 2022**
**Time Zone: GMT+8**

**Topic: High-voltage and insulation technology 2| 高电压与绝缘技术 2**
**Zoom 8 ID: 86964064559**
**Time: 15:45-16:50**

**POSTER**

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| SE0294 | **Title:** Prediction of Switching Impulse Breakdown Voltage of the Air Gap Between Tubular Buses in Substation<br>**Author(s):** Yuancheng Qin, Xianqiang Li, Boyu Ren, Qin Yan and Kang He<br>**Presenter:** Yuancheng Qin<br>**Affiliation:** Wuhan University of Technology, China |
| SE0314 | **Title:** Molecular Dynamics Simulation of Superheated Decomposition of Environmental Friendly C5F10O Mixture Gas<br>**Author(s):** Jun Hou, Bin Li, Yibin Zheng, Siyuan Wang, Weichao Han, Weikang Gao, Zhiqiang Mao and Yanxiu Cui<br>**Presenter:** Yanxiu Cui<br>**Affiliation:** Shandong University, China |
| SE0078 | **Title:** Influence of Thermal Effect on Insulation Performance of Resin Impregnated Paper Bushing<br>**Author(s):** Xiongjie Xie, Baoquan Wan, Wei Hu, Zuoming Xu, Yu Wang, Yeqiang Deng and Yumeng Zeng<br>**Presenter:** Yumeng Zeng<br>**Affiliation:** Wuhan University, China |
| SE0317 | **Title:** Optimized Design and Fatigue Life Analysis of Hydraulic Shock Absorbers for Spring Mechanisms<br>**Author(s):** Feng Li, Lei Mu, Yang Wang, Ning Wei, Min Lei, Shoushan Wu and Shengrui Zhou<br>**Presenter:** Shengrui Zhou<br>**Affiliation:** Shandong University, China |
| SE0188 | **Title:** Transient Model of Transformer Winding Multi-conductor Transmission Line with External Distributed Parameter Elements and Its Modular Packaging<br>**Author(s):** Lei Peng, Yangchun Cheng, Siyun Wei, Xiangdong Liu, Yaowen Wen and Wenzhi Chang<br>**Presenter:** Lei Peng<br>**Affiliation:** North China Electric Power University, China |
| SE0492 | **Title:** Multi-field Coupling Calculation of Room Temperature and Humidity of Switchgear Cables with Multiple Boundary Conditions<br>**Author(s):** Jian Wu, Pinghui Feng, Zhaodong Sun, Baoliang Han, Zhewen Liang and Zijian Jia<br>**Presenter:** Zijian Jia<br>**Affiliation:** China Three Gorges University, China |

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| | SE0048 | **Title:** Modeling And Modification Of Converter Transformer Similarity Model Based On Finite Element And Similarity Theory<br>**Author(s):** Hao Wang, Li Zhang, Youliang Sun, Zhuangzhuang Zhang and Dong Wang<br>**Presenter:** Hao Wang<br>**Affiliation:** Shandong University, China |
| | SE0223 | **Title:** Simulation Study on Influence of Environmental Friendly Cable Insulation Materials on Temperature Rise Characteristics<br>**Author(s):** Qian Wang, Qiming Xu, Sichen Qin, Zeli Ju, Zhe Hou, Huan Lian, Tao Wu, Jingfan Zhang and Rong Shi<br>**Presenter:** Qian Wang<br>**Affiliation:** Xi'an University of Technology, China |
| | SE0230 | **Title:** Statistics for Lightning Parameters of Transmission Lines Based on Tower Block Method<br>**Author(s):** Guohua Yue, Jingxuan He, Yan Gan, Dewen Gu and Zhiye Du<br>**Presenter:** Guohua Yue<br>**Affiliation:** Wuhan University, China |
| | SE0221 | **Title:** Design and Application of Helicopter Hanging Basket<br>**Author(s):** Shuai Li, Lei Li, Jianjun Wu, Jun Wang, Zhihui Qiu and Fujiang Yang<br>**Presenter:** Zhihui Qiu<br>**Affiliation:** North China Electric Power University, China |
| | SE0465 | **Title:** Research on the Factors Influencing the UV Detection of Corona Discharge under Combined AC-DC voltage<br>**Author(s):** Jiahao Huang, Bo Zhang, Guiquan Xie, Chentao Wang, Xiangsheng Zhou, Yanhui Shi, Hai Yuan, Qingjun Wang, Jianrong Kuang, Yunfeng Zhu, Li Tang and Hanghang Zhao<br>**Presenter:** Bo Zhang<br>**Affiliation:** Guangzhou Bureau of China Southern Power Grid Co., Ltd.,EHV Transmission Company, China |
| | SE0501 | **Title:** Experimental Study on Arc Physical Parameters of High Voltage SF6 Circuit Breaker<br>**Author(s):** Lixiong Sun, Qiang Ye, Rongye Yang, Chaochao Yang, Qigen Zhao and Hu Zhao<br>**Presenter:** Hu Zhao<br>**Affiliation:** Northwestern Polytechnical University, China |
| | SE0293 | **Title:** Equilibrium Optimizer-Based Variational Mode Decomposition Method for Partial Discharge Denoising<br>**Author(s):** Xu Huangkuan, Zhu Xiaohui, Jiang Xu, Geng Hang, Bilal Iqbal Ayubi and Zhang Li<br>**Presenter:** Geng Hang<br>**Affiliation:** Shandong University, China |

# Session 28

**December 11, 2022**
**Time Zone: GMT+8**

**Topic: Electrified transportation technology and applications 1 | 电气化交通 1**
**Zoom 8 ID: 86964064559**
**Time: 16:50-17:50**

**POSTER**

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|---|---|
| SE0412 | **Title:** An Improved Sliding Mode Control Scheme for T-type Rectifier Based on Deadbeat Control<br>**Author(s):** Ziyu Wang, Alian Chen, Tong Liu and Qicai Ren<br>**Presenter:** Hang Zhang<br>**Affiliation:** Shandong University, China |
| SE0450 | **Title:** Research on Axial Stability of Power Transformer Windings<br>**Author(s):** Longfu Luo, Xingmao Wen, Xinjin Luo, Wei Qin<br>**Presenter:** Xingmao Wen<br>**Affiliation:** Hunan University, China |
| SE0512 | **Title:** Analysis and Design of EMI Filter Based on Differential Mode Inductor Magnetic Integration<br>**Author(s):** Shaowei He, Subin Lin, Xingwang Yu, Wei Chen<br>**Presenter:** Shaowei He<br>**Affiliation:** Fuzhou University, China |
| SE0229 | **Title:** Study on Pole-changing Starting Scheme for Line-start Permanent Magnet Synchronous Motor<br>**Author(s):** Mengmeng Tian, Yueyang Li, Xiuhe Wang, Wenliang Zhao, Mingzhe Li<br>**Presenter:** Mengmeng Tian<br>**Affiliation:** University of Jinan, China |
| SE0154 | **Title:** Research on Radial Stability of Power Transformer Windings<br>**Author(s):** Luo Longfu, Luo Xinjin, Wen Xingmao, Qin Wei<br>**Presenter:** Luo Xinjin<br>**Affiliation:** Hunan University, China |
| SE0524 | **Title:** A Design Method for Suppressing Radiation Interference in Small Satellite Switching Mode Power Supply<br>**Author(s):** Hou Wei, Yang Zhengguang, Liu Kuiwu<br>**Presenter:** Hou Wei<br>**Affiliation:** China Academy of Space Technology, China |
| SE0308 | **Title:** Stability Analysis and Braking System Design of Icebreaker Propulsion System Based on 3L-NPC Inverter<br>**Author(s):** Nianzhou Liu, Nan Fu, Pengfei Xie, Wenfeng Long, Kui Wang and Yongdong Li<br>**Presenter:** Nan Fu<br>**Affiliation:** Tsinghua University, China |

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| | **SE0433** | **Title:** Flexible Control Strategy of Large Power Intelligent Onshore Charging Facilities for Ship Grid Interaction<br>**Author(s):** Feng Lu, Haifeng Liu, Songsong Zheng, Kai Chen, Chaoyun Xiao, Yi Xing<br>**Presenter:** Chaoyun Xiao<br>**Affiliation:** Beijing Hestar Technology Co., Ltd., China |
| | **SE0382** | **Title:** Decoupling Control Method for Single-phase Cascaded H-bridge Rectifiers<br>**Author(s):** Cungang Hu, Wenke Geng, Wanlun Xu, Yongshun Ma and Bi Liu<br>**Presenter:** Cungang Hu<br>**Affiliation:** Anhui University, China |
| | **SE0212** | **Title:** Fault Diagnosis Algorithms for Power Devices of Traction Inverters in High-Speed Train<br>**Author(s):** Cunxin Ye, Sihui Zhang, Pengcheng Xu, Wensheng Song<br>**Presenter:** Cunxin Ye<br>**Affiliation:** Southwest Jiaotong University, China |
| | **SE0444** | **Title:** Modeling and Control Simulation of Cascaded Brushless Doubly-fed Aircraft Generators<br>**Author(s):** Yonglu Chen, Yuren Li, Yuhui Ma, Rui Ma<br>**Presenter:** Yuhui Ma<br>**Affiliation:** Chinese Flight Test Establishment, China |
| | **SE0397** | **Title:** Research on Broadband Graphene Composite Absorber Based on Chip Electrostatic Protection<br>**Author(s):** Lei Wang, Zhiji Deng and Jinbiao Shu<br>**Presenter:** Lei Wang<br>**Affiliation:** Zhejiang Dahua Technology Co., Ltd, China |

# Session 29

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: DC power transmission and DC power grid 2| 直流输电与直流电网 2**
**Zoom 2 ID: 88531611705**
**Time: 8:30-10:15 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Assoc. Prof. Qian Xiao, Tianjin University China**

**ORAL**

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| **SE0439** | **Title:** Research on Soft-Start Method and Light Load Intermittent Control of LLC Resonant Converter<br>**Author(s):** Hong Xie, Qian Liu, Jingkai Niu, Long Jing<br>**Presenter:** Qian Liu<br>**Affiliation:** Beijing Jiaotong University, China |
| **SE0474** | **Title:** Hierarchical Dispatch of Multi-terminal HVDC Transmission System Considering Flexibility Retrofits of Sending-end Thermal Power Units<br>**Author(s):** Xusheng Guo, Suhua Lou, Amjad Anvari-Moghaddam<br>**Presenter:** Xusheng Guo<br>**Affiliation:** Huazhong University of Science and Technology |
| **SE0137** | **Title:** DC-Side Pole-to-Ground Fault Analysis for Multi-Terminal LCC-MMC Hybrid HVDC System<br>**Author(s):** Zhen He, Pingliang Zeng, Lijun Hang, Yanhua Liu<br>**Presenter:** Zhen He<br>**Affiliation:** Hangzhou Dianzi University, China |
| **SE0138** | **Title:** Universal Modeling Method for Phase-shift-modulated Resonant Switched-Capacitor Converters<br>**Author(s):** Zhenning Li, Shouxiang Li, Suli Zou, Xiaolu Li<br>**Presenter:** Zhenning Li<br>**Affiliation:** Beijing Institute of Technology, China |
| **SE0247** | **Title:** Strict-feedback Nonlinear Sliding Mode Control for Battery Converters in DC Microgrids<br>**Author(s):** Gaohui Mou, Jiawei Chen, Qingchao Song<br>**Presenter:** Gaohui Mou<br>**Affiliation:** Chongqing University, China |
| **SE0090** | **Title:** The Research of Cooperative Control Strategy for Suppressing LCC-HVDC Commutation Failure<br>**Author(s):** Ziyu Guo, Ying Pu, Qidi Zhong, Yajun Lu, Mingyu Zhang<br>**Presenter:** Mingyu Zhang<br>**Affiliation:** North China Electric Power University, China |

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| | SE0511 | **Title:** Stability assessment of renewable energy-based DC microgrids for offshore applications<br>**Author(s):** Waqas Hassan, Evgenii Semshikov, Michael Negnevitsky, Md. Alamgir Hossain<br>**Presenter:** Waqas Hassan<br>**Affiliation:** University of Tasmania, Australia |

# Session 30

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: Optimization and control of cyber-physical energy system 1| 信息物理能源系统优化与控制 1**
**Zoom 3 ID: 87069632470**
**Time: 8:30-10:30 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Dr. Xiaohong Ran, Nanyang Technological University, Singapore**

**ORAL**

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| **SE0108** | **Title:** Research on Blockchain Electric Energy Transaction Based on NSGA2 Genetic Algorithm<br>**Author(s):** Zhang Juan, Xiang Jiani, Xing Tao, Wang Bing, Chen Yuquan<br>**Presenter:** Xing Tao<br>**Affiliation:** Hohai University, China |
| **SE0076** | **Title:** Optimal Coordination of Hydrogen-Based Integrated Energy Systems Considering Thermal Dynamics of Fuel Cells<br>**Author(s):** Xiangxiang Dong, Zhanbo Xu, Jiang Wu, Kun Liu and Xiaohong Guan<br>**Presenter:** Xiangxiang Dong<br>**Affiliation:** Xi'an Jiaotong University, China |
| **SE0306** | **Title:** Economic Scheduling of Integrated Port Energy System Considering the Flexible Operating Condition of Hydrogen Equipments<br>**Author(s):** Qingxin Shi, Yuehan Wang, Liqin Li, Jianfu Ni, Chunhui He and Wenxia Liu<br>**Presenter:** Qingxin Shi<br>**Affiliation:** North China Electric Power University, China |
| **SE0149** | **Title:** Modeling Building Energy Demand for Distributed Renewable Energy System Planning<br>**Author(s):** Jinhui Liu, Yanling Zhao, Zhanbo Xu, Jiang Wu, Kun Liu and Xiaohong Guan<br>**Presenter:** Yanling Zhao<br>**Affiliation:** Xi'an Jiaotong University, China |
| **SE0362** | **Title:** Identification Method for Varying Parameters of Transmission Line Impacted by Ambient Conditions<br>**Author(s):** Hongwen Sun, Xiaoming Dong, Xue Yang, Xueyong Jia, Yue Ma and Zhengqi Liu<br>**Presenter:** Hongwen Sun<br>**Affiliation:** Shandong University, China |
| **SE0079** | **Title:** Supply-Demand Coordination of Wind-Solar-Hydrogen Integrated Energy System Considering Hydrogen Delivery<br>**Author(s):** Xiyan Jian, Zhanbo Xu, Xiangxiang Dong, Jiang Wu, Kun Liu and Xiaohong Guan<br>**Presenter:** Xiyan Jian<br>**Affiliation:** Xi'an Jiaotong University, China |

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| | SE0352 | **Title:** An Online Calculation Method for Optimal Power Flow Based on Optimal Operation Region<br>**Author(s):** Puting Tang, Zeyu Liu, Lewei Zhu, Kai Hou and Wei Pei<br>**Presenter:** Puting Tang<br>**Affiliation:** Tianjin University, China |
| | SE0449 | **Title:** Load Shedding Model Considering Transmission Line Electro-thermal Behaviours Impacted by Ambient Factors<br>**Author(s):** Shunxiang Yu, Xiaoming Dong, Yasong Wang, Chengfu Wang, Yifan Wu and Jingdong Fan<br>**Presenter:** Shunxiang Yu<br>**Affiliation:** Shandong University, China |

# Session 31

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: Power electronic device and its reliability 2|电力电子器件及可靠性 2**
**Zoom 4 ID: 83118449166**
**Time: 8:30-10:30 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Prof. Laili Wang, Xi'an Jiaotong University, China; Asst. Prof. Xiang Zhou, Xi'an Jiaotong University, China**

**ORAL**

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| SE0291 | **Title:** Voltage Fluctuation Suppression Strategy of MMC Sub-module under Unbalanced Grid Voltage<br>**Author(s):** Xiangwei Jiang, Shushan Zhang, Bo Chen and Youhua Jiang<br>**Presenter:** Shushan Zhang<br>**Affiliation:** Shanghai University of Electric Power, China |
| SE0363 | **Title:** Fast On-state Voltage Measurement by a Passive Voltage Clamping Circuit for High Voltage Power Modules<br>**Author(s):** Tianjian Wang, Jianpeng Wang, Yuwei Wu, Kai Gao, Jin Zhang and Laili Wang<br>**Presenter:** Tianjian Wang<br>**Affiliation:** Xi'an Jiaotong University, China |
| SE0388 | **Title:** High-Efficiency Harmonic Wirelessly Power Transfer with Both Radiation and Magnetic-coupling Features at Ultra-low Frequency<br>**Author(s):** Bing Luo, Yongsheng Xu, Bin Xu, Xiaonan Li, Guoqiang Liu and Wenwei Zhang<br>**Presenter:** Bing Luo<br>**Affiliation:** Electric Power Research Institute China Southern Power Grid, China |
| SE0490 | **Title:** DC Transformer with Series-Connected Power Devices Based on Active Clamp Balancing Circuit<br>**Author(s):** Xin Wang, Shuai Shao, Jianjia Zhang, Junming Zhang<br>**Presenter:** Xin Wang<br>**Affiliation:** Zhejiang University, China |
| SE0526 | **Title:** Study on the Matching of Solid State Power Controller in Cascade Application<br>**Author(s):** Hui-Yao Li, Yonggang Chen, Zitian Chen, Peng Gui, Jie Wang, Shenyang Wu<br>**Presenter:** Li Huiyao<br>**Affiliation:** Beijing Space Power Conversion and Control Engineering Research Center, China |
| SE0070 | **Title:** Reliability Analyses for Hybrid Modular Multilevel Converters Considering the Device-Level Uneven Power Losses<br>**Author(s):** Binbing Xia, Yating Gou, Shuhuai Shi, Daoyuan Yang, Feng Wang, Fang Zhuo<br>**Presenter:** Binbing Xia<br>**Affiliation:** Xi'an Jiaotong University, China |

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| | **SE0083** | **Title:** Research on the Novel Topology of On-Load Voltage Regulator Based on Power Electronic Converter<br>**Author(s):** Longfei Sun, Jingyuan Yin, Libo Han, Lixin Wu, Qunhai Huo, Tongzhen Wei<br>**Presenter:** Longfei Sun<br>**Affiliation:** Institute of Engineering Chinese Academy of Sciences, China |
| | **SE0205** | **Title:** A Nonlinear Dead-Time Compensation Strategy Based on Current Prediction for High-Capacity Cascaded H-Bridge Test System<br>**Author(s):** Songtao Huang, Ye Jie, Baojin Li, Jinbang Xu, Anwen Shen, Chen Zhang<br>**Presenter:** Songtao Huang<br>**Affiliation:** Huazhong University of Science and Technology, China |

# Session 32

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: Fault diagnosis and protection of power system 2| 电力系统故障检测及保护控制 2**
**Zoom 5 ID: 815 9467 4058**
**Time: 8:30-10:30 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Assoc. Prof. Bin Wang, Tsinghua University, China**

**ORAL**

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| **SE0227** | **Title:** Distance Protection for AC Transmission Lines of MMC-HVDC System With Offshore Wind Farms Based on Parameter Identification<br>**Author(s):** Qingrui Tu and Wei Liu<br>**Presenter:** Xiaoping Gao<br>**Affiliation:** System Operation and Control Center of Guangdong Power Grid, China |
| **SE0440** | **Title:** Feeder Terminal Unit Model Based on Electromagnetic Transient Simulation Platform<br>**Author(s):** Yajuan Wang, Weichen Liang, Zhiyu Zhao, Bo Liu, Xuan Li and Bowen Liu<br>**Presenter:** Bowen Liu<br>**Affiliation:** North China Electric Power University, China |
| **SE0455** | **Title:** Fault Location Method in Active Distribution Network Based on Voltage Information of PQMS<br>**Author(s):** Boliang Liu, Jiawei Xiang, Kai Xia, Yiqing Xu, Jinmin Cheng and Aixia Bao<br>**Presenter:** Kai Xia<br>**Affiliation:** East China Electric Power Design Institute Co., Ltd of China Power Engineering Consulting Group, China |
| **SE0062** | **Title:** Research on Resonant Frequency of Reradiation Interference from Power Transmission Lines at 1.7MHz-3MHz Based on Characteristic Modes<br>**Author(s):** Zheyuan Gan, Feng Wang, Bo Tang, Zhibin Zhao, Jiangong Zhang<br>**Presenter:** Feng Wang<br>**Affiliation:** China Three Gorges University, China |
| **SE0077** | **Title:** New Result on Event-Triggered Dynamic Output Feedback Control for Discrete-Time Switched Systems<br>**Author(s):** Jiapeng Cheng, Hongbin Zhang<br>**Presenter:** Jiapeng Cheng<br>**Affiliation:** University of Electronic Science and Technology of China, China |
| **SE0087** | **Title:** Research on Constant Power Loads Stability of DC Microgrid Based on Machine Learning<br>**Author(s):** Jian Yang, Xiao Liu, Mi Dong, Dongran Song, Li Li, Liansheng Huang<br>**Presenter:** Xiao Liu<br>**Affiliation:** Central South University, China |

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| | **SE0514** | **Title:** Analysis of foundation characteristics of power equipment Based on damage theory<br>**Author(s):** Yongsheng Yang, Minzhen Wang, Changshun Zhao, Yongbo Lang, Minghui Liu, Keyu Yue, Hongdan Zhao, Yu Zheng and Cheng Li<br>**Presenter:** Yang Yongsheng<br>**Affiliation:** Changchun Institute of Technology, China |
| | **SE0436** | **Title:** Matching Design Method of SSPC and Fuse Used in Series in Spacecraft Power Distribution System<br>**Author(s):** Jie Wang, Li Wang, Jianchao Wu, Xiong He, Yonggang Chen, Huiyao Li<br>**Presenter:** Wang jie<br>**Affiliation:** Beijing Spacecraft, China |

# Session 33

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: Optimal management and control of smart grid 2 | 智能电网优化管理与运行控制 2**
**Zoom 6 ID: 86947297263**
**Time: 8:30-10:30 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Dr. Ning Zhang, Anhui University, China**

**ORAL**

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| SE0431 | **Title:** Prediction of carrying capacity of digital twin power information communication network based on CNN-GRU neural network<br>**Author(s):** Yang Shen and Xinliu Wang<br>**Presenter:** Xinliu Wang<br>**Affiliation:** State Grid Liaoning Electric Power Co., Ltd. Information Communication Branch, China |
| SE0442 | **Title:** Research on Electricity Retail Transaction Process Based on Block chain Technology<br>**Author(s):** Xilin Xu, Ye Zhang, Jian Zhang, Miao Liu, Na Zhang and Zongyuan Wang<br>**Presenter:** Ye Zhang<br>**Affiliation:** Liaoning Electric Power Trading Center Co., Ltd., China |
| SE0061 | **Title:** The Fuzzy Evaluation of Transmission Line Status Based on Grey Correlation Method<br>**Author(s):** Yuheng Zhang, Chicheng Sha, Changbo Liu, Hailin Liao, Guo Huang, Zhendong Qian<br>**Presenter:** Yuheng Zhang<br>**Affiliation:** Southeast University, China |
| SE0274 | **Title:** A low-carbon optimal dispatch model of a new multi-energy complementary energy system with the goal of carbon reduction<br>**Author(s):** Qinglun Pang, Wenying Liu, Zimin Zhu, Yang Li, Fadi Maalouf and Li Lin<br>**Presenter:** Qinglun Pang<br>**Affiliation:** North China Electric Power University, China |
| SE0463 | **Title:** Review on the Development of Energy Efficiency Assessment Methods for Distribution Networks<br>**Author(s):** Liang Chen, Ma Xi-ping, Fan Di-long, Dong Xiao-yang, Li Ya-xin, Yang Jun-ting<br>**Presenter:** Liang Chen<br>**Affiliation:** State Grid Gansu Electric Power Research Institute, China |
| SE0200 | **Title:** A Comprehensive Evaluation of Distributed Photovoltaic Power Quality Based on Time Probability Distribution<br>**Author(s):** Yang Liu, Lisheng Li, Anbin Zhang, Haidong Yu, Shidong Zhang, Min Huang, Wenbin Liu, Xinhong You, Pengping Zhang<br>**Presenter:** Anbin Zhang<br>**Affiliation:** ShanDong University, China |

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| | **SE0094** | **Title:** Probabilistic Planning of Transmission Network Considering Operational Flexibility of Power System<br>**Author(s):** Jianjie Li, Ping Li, Peng Li, Junshao Guo, Mingqiang Wang<br>**Presenter:** Junshao Guo<br>**Affiliation:** Shandong University, China |
| | **SE0443** | **Title:** Research and Application of Block Chain Technology in Electricity Market Transactions<br>**Author(s):** Ye Zhang, Rongmao Wang, Qingchun Li, Nannan Xia, Na Zhang and Jingwei Hu<br>**Presenter:** Ye Zhang<br>**Affiliation:** Liaoning Electric Power Trading Center Co., Ltd., China |

# Session 34

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: Topology and control of power converters 2 | 电力电子变换器拓扑与控制 2**
**Zoom 1 ID: 82273564217**
**Time: 8:30-10:15 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Prof. Rongwu Zhu, Harbin Institute of Technology Shenzhen, China; Asst. Prof. Jianbo Jiang, Dali University, China**

**ORAL**

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| SE0277 | **Title:** DC Capacitor Voltage Control Strategy of Five-level NPC Converter Based on Hybrid SVPWM<br>**Author(s):** Ning Li, Jia-Le Hu, Zi-Han Xiao, Pan-Pan Shen, Xu-Yang Gong and Dan Zhao<br>**Presenter:** Jia-Le Hu<br>**Affiliation:** Xi'an University of Technology, China |
| SE0462 | **Title:** Variable-Weight Model Predictive Modulation Strategy for A Si-SiC Cascaded H-bridge Inverter<br>**Author(s):** Ziyue Guo, Huimin Quan, Zishun Peng, Zhenxing Zhao, Minying Li, Yong Ning<br>**Presenter:** Ziyue Guo<br>**Affiliation:** Hunan University, China |
| SE0499 | **Title:** Two-stage DVR Control With Improved Dynamic Performance Under Nonlinear Load Condition<br>**Author(s):** Yongqi Li, Youjie Shi, Zhenkai Hu, Changyue Zou, Qikai Lei<br>**Presenter:** Youjie Shi<br>**Affiliation:** State Key Laboratory of HVDC, Electric Power Research Institute China Southern Power Grid, China |
| SE0505 | **Title:** Wide Load Range Totem Pole Bridgeless PFC in Mixed Conduction Mode based on One Cycle Control<br>**Author(s):** Yuhui Yang, Qiang Zhang, Zhenye Dong, Tianhao Xia, Ao Gu<br>**Presenter:** Yuhui Yang<br>**Affiliation:** Xiamen University of Technology, China |
| SE0047 | **Title:** Terminal Reactive Power Compensation and Adaptive Capacitance Adjustment Technology<br>**Author(s):** Huang Desheng, Hou Qianbing, Mao Shufan<br>**Presenter:** Mao Shufan<br>**Affiliation:** Tianjin University of Technology, China |
| SE0157 | **Title:** Research on Explicit Model Prediction Control of Pulse Current Source<br>**Author(s):** Guitao Chen, Zhe Wang, Xiping Huang, Xi Chen<br>**Presenter:** Zhe Wang<br>**Affiliation:** Xi'an University of Technology, China |

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| | SE0209 | **Title:** Frequency-Adaptive Virtual Variable Sampling-Based Repetitive Control for Active Power Filter<br>**Author(s):** Dong Liu, Baojin Li, Songtao Huang, Linguo Liu, Haozhe Wang, Yukai Huang<br>**Presenter:** Dong Liu<br>**Affiliation:** Huazhong University of Science and Technology, China |

# Session 35

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: Electromagnetic compatibility (EMC) technology | 电磁兼容**
**Zoom 2 ID: 88531611705**
**Time: 10:45-12:45 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Prof. Hong Li, Beijing Jiaotong University;**
**Assoc. Prof. Xuebao Li, North China Electric Power University, China**

**ORAL**

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| SE0275 | **Title:** Design of Planar Magnetic Integrated LCL-EMI Filter For the Grid-connected Inverter<br>**Author(s):** Zijian Lu, Yitao Liu and Jian Yin<br>**Presenter:** Yitao Liu<br>**Affiliation:** Shenzhen University, China |
| SE0368 | **Title:** A Compact Passive-Active Hybrid EMI Filter with Phase Compensation for Power Converters<br>**Author(s):** Hong Li, Siyi Wang, Chongmo Zhang and Zuoxing Wang<br>**Presenter:** Siyi Wang<br>**Affiliation:** Beijing Jiaotong University, China |
| SE0250 | **Title:** Customized Fixture Adapter for Accurate CM Choke Impedance Measurement Up to 100 MHz<br>**Author(s):** Huamin Jie, Siping Gao, Zhenyu Zhao, Fei Fan, Zhenning Yang, Minghai Dong, Firman Sasongko, Amit Kumar Gupta, Kye Yak See<br>**Presenter:** Huamin Jie<br>**Affiliation:** Nanyang Technological University, Singapore |
| SE0284 | **Title:** Electric Field Optimization of Basin Insulator of 220 kV Geographic Information System<br>**Author(s):** Haomiao Xin, Huashen Guan and Guofu Sun<br>**Presenter:** Haomiao Xin<br>**Affiliation:** Jiangmen Power Supply Bureau Guangdong Power Grid Co., Ltd, China |
| SE0479 | **Title:** A Novel Common Mode EMI Terminal Modeling Method of Three-phase Inverter<br>**Author(s):** Gang Liu, Jing Xia, Wanwan Jin, Xiude Tu<br>**Presenter:** Gang Liu<br>**Affiliation:** Wuhan Second Ship Design and Research Institute, China |
| SE0055 | **Title:** Experiment and Analysis of Influence of Vertical Grounding Body Passive Interference on Shortwave Wireless Direction-Finding Stations<br>**Author(s):** Zheyuan Gan, Longbin Zhang, Bo Tang, Zhibin Zhao, Jiangong Zhang<br>**Presenter:** Longbin Zhang<br>**Affiliation:** China Three Gorges University Yichang, China |

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| | **SE0236** | **Title:** Conducted EMI Estimation on GaN Step-up Resonant Converter for Electric Propulsion System<br>**Author(s):** Minghai Dong, Hui Li, Shan Yin, Yingzhe Wu, Zhenyu Zhao, Huamin Jie, Kye Yak See<br>**Presenter:** Minghai DONG<br>**Affiliation:** University of Electronic Science and Technology of China, China |
| | **SE0515** | **Title:** Analysis of the Influence of Low Noise Amplifier Position on Small Signal Results<br>**Author(s):** Zhi-Cheng Wang, Hao Wan, Ying-Jie Wang, Wen-Xuan Wei, Ze Yu<br>**Presenter:** Zhi-Cheng Wang<br>**Affiliation:** The 54th Research Institute of CETC, China |

# Session 36

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: Electrified transportation technology and applications 2 | 电气化交通 2**
**Zoom 3 ID: 87069632470**
**Time: 10:45-12:30 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Prof. Chenchen Wang, Beijing Jiaotong University, China; Assoc. Prof. Kai Li, Beijing Jiaotong University, China**

**ORAL**

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| SE0304 | **Title:** Probabilistic Energy Consumption Estimation for Electric Buses<br>**Author(s):** Jingfei Jiang, Bo Bao, Fanzhuo Meng, Yifan Ma, Hui Zhang, Yucheng Jin, Fengwen Pan and Xinmei Yuan<br>**Presenter:** Jingfei Jiang<br>**Affiliation:** Jilin university, China |
| SE0390 | **Title:** Overvoltage Suppression Strategy for Permanent Magnet Synchronous Motor System without Electrolytic Capacitor based on Maximum Current Limitation<br>**Author(s):** Yuehan Li, Zhonggang Yin, Yixuan Gao and Chang Lu<br>**Presenter:** Yuehan Li<br>**Affiliation:** Xi'an University of Technology, China |
| SE0350 | **Title:** An Abnormal Electrical Phenomena Identification Method for Vehicle-grid Electrical Coupling System<br>**Author(s):** Tao Yang, Fulin Zhou, Feifan Liu, Tengyu Tian, Ruixuan Yang and Jinfei Xiong<br>**Presenter:** Tao Yang<br>**Affiliation:** Southwest Jiaotong University, China |
| SE0052 | **Title:** Orderly Charging Strategy for Residential Areas Taking into Account Demand from both Sides of Supply and Demand<br>**Author(s):** Kaiyu Zhang, Yingjie Tian, Bing Shen, Yun Sun, Congheng Zhou, Meixia Zhang<br>**Presenter:** Congheng Zhou<br>**Affiliation:** Shanghai University of Electric Power, China |
| SE0369 | **Title:** System Modeling and Characteristics Analysis of Dynamic Wireless Power Transmission System with Multiple Air-core Transmitting Coils<br>**Author(s):** Ziying Tian, Guochen Hao and Jinglong Wen<br>**Presenter:** Ziying Tian<br>**Affiliation:** North University of China, China |
| SE0470 | **Title:** Design of a Bi-directional DC-DC Converter for High-efficiency Emergency Self-traction of High-speed Railway Trains<br>**Author(s):** Qiyuan Tian, Guohong Zeng, Wenzheng Xu, Zhihua Huang, Dejin Ma<br>**Presenter:** Qiyuan Tian<br>**Affiliation:** Beijing Jiaotong University, China |

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| | SE0176 | **Title:** EV charging behavior simulation and analysis using real-world charging load data<br>**Author(s):** Ganheng Ge, Jinrui Tang, Jianchao Liu, Honghui Yang<br>**Presenter:** Gangheng Ge<br>**Affiliation:** Wuhan University of Technology, China |

# Session 37

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: Optimal management and control of smart grid 3| 智能电网优化管理与运行控制 3**
**Zoom 4 ID: 83118449166**
**Time: 10:45-12:30 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Assoc. Prof. Qian Wang, Xi'an university of technology, China**

**ORAL**

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| **SE0409** | **Title:** Multi-Time Scale Energy Management Strategy for Smart Community Considering Demand Response<br>**Author(s):** Fangyuan Han, Nan Wang, Alian Chen and Tong Liu<br>**Presenter:** Fangyuan Han<br>**Affiliation:** Shandong University, China |
| **SE0520** | **Title:** Smart Grid Data Mobile Interconnection Construction Plan<br>**Author(s):** Jun Guo, Man Hu, Zhongyang Xu, Wanshu Guo, Min Li and Yibo Wang<br>**Presenter:** Jun Guo<br>**Affiliation:** NorthChina Branch of State Grid Corperarion of China, China |
| **SE0102** | **Title:** Adaptive MPC-Based Cooperative Frequency Control for Community Microgrid<br>**Author(s):** Weichao Wang, Naoto Yorino, Yutaka Sasaki, Yushifumi Zoka, Ahmed Bedawy, Seiji Kawauchi<br>**Presenter:** Weichao Wang<br>**Affiliation:** Hiroshima University, Japan |
| **SE0245** | **Title:** Coordinated Optimization of Multi-Type Peak Shaving Resources Considering Carbon Budget Constraints<br>**Author(s):** Hujun Li, Mengxuan Lv, Fangzhao Deng, Meng Yang, Bo Yuan, Dong Zhang<br>**Presenter:** Hujun Li<br>**Affiliation:** State Grid Henan Economic Research Institute, China |
| **SE0150** | **Title:** Game-Based Applications and Control towards Future Smart Grids<br>**Author(s):** Yingzhe Jia, June Feng and Yuying Zhang<br>**Presenter:** Yingzhe Jia<br>**Affiliation:** Shandong Univeristy, China |
| **SE0194** | **Title:** The Optimal Dispatching of Micro Grid based on Improved Limit Learning Machine under Source-load interactive electric market<br>**Author(s):** Wenzhe Zhang, Liang Qiao, Zhicheng Yu, Zhenyu Han and Tao Wang<br>**Presenter:** Wenzhe Zhang<br>**Affiliation:** State Grid Chongqing Electric Power Company, China |

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| | SE0179 | **Title:** Green hydrogen energy storage sizing method based on adversarial learning technology under inaccurate supervision<br>**Author(s):** Ling Zhu, Qian Wang, Xinda Wang, Xueguang Zhang<br>**Presenter:** Qian Wang<br>**Affiliation:** Harbin Institute of Technology, China |

# Session 38

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: High-voltage and insulation technology 3 | 高电压与绝缘技术 3**
**Zoom 5 ID: 815 9467 4058**
**Time: 10:45-12:15 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Prof. Li Zhang, Shandong University, China**

**ORAL**

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| **SE0066** | **Title:** The Effect of X-ray Radiation Dose on the Performance of Power Cable Insulation Materials<br>**Author(s):** Zhongyi Xue, Yunlin Ye, Ruijian Yan, Wei Wang, Wenpeng Li, Wei Yang and Xiaoning Shi<br>**Presenter:** Zhongyi Xue<br>**Affiliation:** North China electric power university, China |
| **SE0164** | **Title:** Research Status of Nano - modified Transformer Oil Performance<br>**Author(s):** Chuanqiang Che, Yunpeng Xue, Chunxu QIN, Qiong WANG, Liqiang LIU and Pengfei Zhu<br>**Presenter:** Yunpeng Xue<br>**Affiliation:** Inner Mongolia Power Research Institute, China |
| **SE0144** | **Title:** Multi-physical field simulation of nonlinear high-voltage ceramic capacitor based on COMSOL<br>**Author(s):** Yuxing Lei, Yan Yang, Xueyang Bai, Kai Liu and Bo Gao<br>**Presenter:** Yuxing Lei<br>**Affiliation:** Southwest Jiaotong University, China |
| **SE0089** | **Title:** Research on Transmission Characteristics of Partial Discharge Signals in XLPE Cable Body<br>**Author(s):** Chunyu Sun and Zhiguo Tang<br>**Presenter:** Chunyu Sun<br>**Affiliation:** North China Electric Power University, China |
| **SE0495** | **Title:** Effect of Polarity-Reversal Voltage on Charge Properties of Silicone Rubber/SiC Composites for HVDC Cable Accessory Insulation at Different Temperatures<br>**Author(s):** Zhuoran Yang, Honghua Xu, Cang Bai, Lixiang Lv, Chaochao Zhai, Jiawei Qi and Zhonglei Li<br>**Presenter:** Zhuoran Yang<br>**Affiliation:** State Grid Nanjing Power Supply Company, China |
| **SE0031** | **Title:** Streamer Inception Voltage Evaluation and Industry Validations<br>**Author(s):** Wenkai Shang, Deju Wang, Tiziana Bertoncelli, Daniel Marcsa, Marko Maras and David Twyman<br>**Presenter:** Deju Wang<br>**Affiliation:** ANSYS, Germany |

# Session 39

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: Energy storage technology and system 5| 新型电池设计与储能技术 5**
**Zoom 6 ID: 86947297263**
**Time: 10:45-12:30 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Prof. Xiaosong Hu, Chongqing University, China**

**ORAL**

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| | **SE0113-A** | **Title:** Integrating Physics with Machine Learning for Lithium-Ion Battery Modeling<br>**Author(s):** Hao Tu, Scott Moura, Yebin Wang, Huazhen Fang<br>**Presenter:** Hao Tu<br>**Affiliation:** University of Kansas, USA |
| | **SE0404** | **Title:** Optimal Configuration of Energy Storage for Integrated Energy Stations Considering Multiple Scenarios<br>**Author(s):** Duanmu Chenrui, Linjun Shi, Yang Li, Feng Wu,Qiaofeng Wu and Yingjing He<br>**Presenter:** Duanmu Chenrui<br>**Affiliation:** Hohai University, China |
| | **SE0517** | **Title:** Long Short-Term Memory Recurrent Neural Network for Estimating State of Charge of Energy Storage System for Grid Services<br>**Author(s):** Dylon Hao Cheng Lam, Yun Seng Lim, Lee Cheun Hau, Jianhui Wong<br>**Presenter:** Dylon Hao Cheng Lam<br>**Affiliation:** Universiti Tunku Abdul Rahman, Malaysia |
| | **SE0482** | **Title:** Research on Frequency Regulation Control Strategy of Hybrid Energy Storage System Based on Adaptive Modal Number VMD<br>**Author(s):** Chamin Geng, Xiaolong Yang, Tianhai Zhang, Bo Chen<br>**Presenter:** Chamin Geng<br>**Affiliation:** Jiangsu Frontier Electric Technology Co., Ltd., China |
| | **SE0522** | **Title:** Day-ahead Scheduling of Integrated Energy System Coupled with Liquid Air Energy Storage System<br>**Author(s):** Ruifang Zeng, Chunsheng Wang, Yuan Cao, Yukun Hu<br>**Presenter:** Ruifang Zeng<br>**Affiliation:** Central South University, China |
| | **SE0027** | **Title:** A Coordinated Control Strategy for BESS Considering Multi-application Scenarios in Wind Power-Energy Storage Station<br>**Author(s):** Hengning Yu, Liangzhong Yao, Fan Cheng, Hui Liu, Kairang Wang, Xiangjun Li, Jian Xu, Beilin Mao<br>**Presenter:** Hengning Yu<br>**Affiliation:** Wuhan University , China |

# Session 40

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: Optimization and control of cyber-physical energy system 2| 信息物理能源系统优化与控制 2**
**Zoom 1 ID: 82273564217**
**Time: 10:45-12:15 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Dr. Qingxin Shi, North China Electric Power University, China**

**ORAL**

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| **SE0266** | **Title:** An Optimal Pulse Heating Strategy for Lithium-ion Batteries based on Synchronous Buck-Boost Converter<br>**Author(s):** Yunsheng Fan, Zhiwu Huang, Heng Li, Fu Jiang, Hui Peng and Jun Peng<br>**Presenter:** Yunsheng Fan<br>**Affiliation:** Central South University of China, China |
| **SE0486** | **Title:** A Robust Deep Q-Network Based Attack Detection Approach in Power Systems<br>**Author(s):** Xiaohong Ran, Wee Peng Tay and Christopher H. T. Lee<br>**Presenter:** Xiaohong Ran<br>**Affiliation:** Nanyang Technological University, Singapore |
| **SE0418** | **Title:** Research on Collaborative Planning of Charging Facilities and Distribution Network in Old Residential Areas<br>**Author(s):** Guoming Liu, Hui Yu, Zhixing Lv, Kai Kang, Hu Li, Jing Zhang<br>**Presenter:** Jing Zhang<br>**Affiliation:** China Electric Power Research Institute,Beijing, China |
| **SE0525** | **Title:** Research on Operation Efficiency Evaluation of Carbon Emission Pilot Cities Based on DEA Model<br>**Author(s):** Xue Li, Fubo Zhang, Xiaolong Liang, Yuqi Zhao, Xiaokun Yu, Jing Ao and Sai Li<br>**Presenter:** Li Xue<br>**Affiliation:** State Grid Jilin Electric Power Co., Ltd. Baicheng Power Supply Company, China |
| **SE0003** | **Title:** Modified Coordination of Voltage-dependent Reactive Power Control with Inverter-based DER for Voltage Regulation in Distribution Networks<br>**Author(s):** Watcharin Srirattanawichaikul<br>**Presenter:** Watcharin Srirattanawichaikul<br>**Affiliation:** Chiang Mai University, Thailand |
| **SE0074** | **Title:** Numerical Simulation of Coal Combustion Characteristics of Boiler with Variable Load<br>**Author(s):** Shangwen Huang, Hao Lu, Wu Yao, Pengyuan Han, Yongxia Liu, Yanmin Zhang<br>**Presenter:** Shangwen Huang<br>**Affiliation:** Xinjiang University, China |

# Session 41

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: Modern power system: stability and control 3 | 新型电力系统稳定分析与控制 3**
**Zoom 2 ID: 88531611705**
**Time: 13:30-15:15 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Assoc. Prof. Lei Chen, Tsinghua University, China**

**ORAL**

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| SE0262 | **Title:** Damping Analysis of Outer Control Loops and Impacts on Stability of Grid-Connected VSC<br>**Author(s):** Boyuan Zhao, Lei Chen, Yong Min, Guangyuan Yu and Aihui Yin<br>**Presenter:** Boyuan Zhao<br>**Affiliation:** Tsinghua University, China |
| SE0351 | **Title:** Natural Inertia Response of Static Synchronous Compensator by PLL-Feedforward Control<br>**Author(s):** Xiangyu Dong, Xiaoru Wang and Ruiqing Fu<br>**Presenter:** Xiangyu Dong<br>**Affiliation:** Southwest Jiaotong University, China |
| SE0354 | **Title:** Robust optimization model of AC/DC Hybrid distribution network considering renewable energy uncertainty<br>**Author(s):** Yue Ma, Xiaoming Dong, Xue Yang, Zhengqi Liu, Xueyong Jia and Hongwen Sun<br>**Presenter:** Yue Ma<br>**Affiliation:** Shandong University, China |
| SE0015 | **Title:** Reconstruction of Impedance Based Stability Analysis Using Bode Plots for Grid-Connected-Inverter with Distributed Cable Parameter Model<br>**Author(s):** Kai Wang, Jing Xian Yang and Jing Tao Huang<br>**Presenter:** Wang Kai<br>**Affiliation:** Northwest Minzu University, China |
| SE0067 | **Title:** Optimization and application of power grid stability control based on photovoltaic rapid power control technology<br>**Author(s):** Shuchao Wang, Shengpeng Duan and Gaoxiang Mi<br>**Presenter:** Shuchao Wang<br>**Affiliation:** SouthEast University, China |
| SE0421 | **Title:** Key branch identification of wind power grid-connected system based on PSASP time-domain simulation method<br>**Author(s):** Hongqiang Wu, Minghua Jiang, Jianyong Hu, Jing Wang and Jun Hu<br>**Presenter:** Jun Hu<br>**Affiliation:** State Key Laboratory of Alternate Electrical Power System with Renewable Energy Sources, China |

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| | SE0129 | **Title:** Design of Subsynchronous Oscillation Damping Controller of Grid-Connected VSC Based on Selective Modal Analysis Method<br>**Author(s):** Xumeng Cui, Lei Chen, Yong Min and Wei Chai<br>**Presenter:** Xumeng Cui<br>**Affiliation:** Tsinghua University, China |

# Session 42

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: High-voltage and insulation technology 4| 高电压与绝缘技术 4**
**Zoom 3 ID: 87069632470**
**Time: 13:30-15:15 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Assoc.Prof. Jun Jiang, Nanjing University of Aeronautics and Astronautics, China**

**ORAL**

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| SE0024 | **Title:** Research on Electrical Properties of XLPE HVDC Cable Insulation Materials Based on Nanocomposites<br>**Author(s):** Chuanbo Wang, Hao Zeng, Kai Gao, Dong Li, Longxiao Chen and Zhien Zhu<br>**Presenter:** Chuanbo Wang<br>**Affiliation:** State Grid Electric Power Research Institute, China |
| SE0163 | **Title:** Research on electromagnetic wave propagation characteristics of multi-source partial discharge in cable intermediate joints<br>**Author(s):** Yulong Hu, Changyun Li and Jingyu Yang<br>**Presenter:** Yulong Hu<br>**Affiliation:** Shandong University of Science and Technology, China, China |
| SE0183 | **Title:** Analysis of influencing factors of carbon emissions in the power industry and forecast of peak scenarios<br>**Author(s):** Zhenfang Xing, Changyun Li and Meng Sun<br>**Presenter:** Zhenfang Xing<br>**Affiliation:** Shandong University of Science and Technology, China |
| SE0241 | **Title:** Modeling and Simulation of Multiphysics Coupling for High-Power High-Frequency Transformers<br>**Author(s):** Yaqian He, Jinfeng Liu, Yu Song, Bo Li and Jun Jiang<br>**Presenter:** Yaqian He<br>**Affiliation:** Nanjing University of Aeronautics and Astronautics, China |
| SE0244 | **Title:** Research on Arc Discharge Contour Extraction in Transformer Insulating Oil in Low Brightness Environment<br>**Author(s):** Qizhao Zhang, Hongbin Wu, Yifan Wang, Ziyue Zhang, Haoxi CONG and Hongshun Liu<br>**Presenter:** Qizhao Zhang<br>**Affiliation:** Shandong University, China |
| SE0513 | **Title:** A 4-stage Negative Voltage Charge Pump with Randomly Selectable Parallel Switches<br>**Author(s):** Chua-Chin Wang, Hsin-Che Wu and Tsung-Hsien Lin<br>**Presenter:** Chua-Chin Wang<br>**Affiliation:** National Sun Yat-Sen University, China |

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| | SE0030 | **Title:** Simulation study on space charge distribution of AC XLPE cable under DC voltage<br>**Author(s):** Longxiao Chen, Jing Huang, Zhien Zhu, Chuanbo Wang and Hao Zen<br>**Presenter:** Longxiao Chen<br>**Affiliation:** State Grid Electric Power Research Institute, China |

# Session 43

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: Topology and control of power converters 3 | 电力电子变换器拓扑与控制 3**
**Zoom 4 ID: 83118449166**
**Time: 13:30-15:30 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Dr. Qi Guo, Hunan University, China**

**ORAL**

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| SE0313 | **Title:** A Constant Frequency Constant Duty Cycle Soft Startup Control Method with Energy Limitation Features for CLLC Converters<br>**Author(s):** Kai Zhang, Huan Chen and Kai Sun<br>**Presenter:** Kai Zhang<br>**Affiliation:** Tsinghua University, China |
| SE0332 | **Title:** Cascaded H-bridge Converters With Sensorless Voltage Balance Through Parallel Branches<br>**Author(s):** Jinming Li, Shunliang Wang, Rui Zhang, Junpeng Ma, Xin Liao and Tianqi Liu<br>**Presenter:** Jinming Li<br>**Affiliation:** Sichuan University, China |
| SE0478 | **Title:** A Branch-Sharing Partial Power Converter with Bipolar Voltage Regulation<br>**Author(s):** Mingdong Wang, Guangfu Ning, Wenjing Xiong, Mei Su<br>**Presenter:** Mingdong Wang<br>**Affiliation:** Central South University, China |
| SE0410 | **Title:** A Clustered Voltage Balancing Method of Star-Connected Cascaded H-Bridge STATCOM Under Unbalanced Grid Voltage<br>**Author(s):** Yanchen Yang, Jingbo Liu, Yanbing Zhang, Ling Zuo, Yongqiang Feng, Qingxin Liu and Chang Yuan<br>**Presenter:** Ling Zuo<br>**Affiliation:** North China Electric Power University, China |
| SE0370 | **Title:** A Model Prediction Control Method for Improving Transient Stability of Islanded Microgrid with Heterogeneous Micro-source Under Large Disturbance<br>**Author(s):** Zheng Lan, Yong Li, Fangreng Wu, Jinhui Zeng and Xueping Yu<br>**Presenter:** Yong Li<br>**Affiliation:** Hunan University of Technology, China |
| SE0218 | **Title:** Equivalent Inertia and Dynamic Performance of Different VSC Control Strategies<br>**Author(s):** Yangjian Ling, Meng Huang, Xikun Fu, Xiaoming Zha, Zijing Wan, Han Yan<br>**Presenter:** Yangjian Ling<br>**Affiliation:** Wuhan University, China |

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| | **SE0255** | **Title:** Offset-Free Model Predictive Control of Interleaved Boost Converter Based on Extended State Observer<br>**Author(s):** Shudan Jin, Shengrong Zhuo, Yigeng Huangfu<br>**Presenter:** Shudan Jin<br>**Affiliation:** Northwestern Polytechnical University, China |
| | **SE0141** | **Title:** Research on Railway Braking Energy Feedback Device and Control Method<br>**Author(s):** Hongbin Pan, Changmin Yuan, Kai Qin, Dongdong Chen, Siqi Peng<br>**Presenter:** Changmin Yuan<br>**Affiliation:** Xiangtan University, China |

# Session 44

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: Modeling and control of distributed energy sources 3 | 分布式能源及优化控制 3**
**Zoom 5 ID: 815 9467 4058**
**Time: 13:30-15:45 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Prof. Xiaofeng Sun, Yanshan University, China;**
**Prof. Chaobo Dai, State Grid Smart Grid Research Institute Co., Ltd., China**

**ORAL**

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| **SE0288** | **Title:** Energy Management of a Small Spare Energy Subsystem Far away from Large Integrated Energy System<br>**Author(s):** Jiaming Tan, Xinying Liu and Hongyou Li<br>**Presenter:** Jiaming Tan<br>**Affiliation:** Liaoning Technical University, China |
| **SE0319** | **Title:** A Method to Estimate the Power Generation of PV Power Stations Along the Highway Based on Digital Maps<br>**Author(s):** Jiao Ma, Yunpeng Zhang and Li Zhang<br>**Presenter:** Jiao Ma<br>**Affiliation:** Shandong university, China |
| **SE0379** | **Title:** A DC Bus Voltage Fluctuation Suppression Method Based on ICESO-ADRC for Wave Energy Conversion System<br>**Author(s):** Chonggan Liang, Hongxing Wang, Xinran Guo, Shi Liu, Yi Yang and Zhigang Liu<br>**Presenter:** Chonggan Liang<br>**Affiliation:** China Southern Power Grid Technology Co., Ltd., China |
| **SE0184** | **Title:** Dynamic reconfiguration method of partially shaded PV array based on traveling salesman problem<br>**Author(s):** Siyu Chen, Mingxuan Mao, Haowen Shi<br>**Presenter:** Siyu Chen<br>**Affiliation:** Chongqing University, China |
| **SE0187** | **Title:** Fault Recovery Strategy of Distribution Network with Distributed Generation Based on Island Division<br>**Author(s):** Zezhou Wang, Gang Chen, Lun Chen, Dongli Jia, Min Wu, Tianyuan Kang<br>**Presenter:** Tianyuan Kang<br>**Affiliation:** China Electric Power Research Institute Co., Ltd, China |
| **SE0211** | **Title:** Finite Control Set MPC for Grid-Connected Photovoltaic Asymmetric Multiport Converter<br>**Author(s):** Elias Collao, Christian Rojas, Ana Llor, Xiaoqiang Guo, Hugues Renaudineau, Jorge Marin<br>**Presenter:** Christian Rojas<br>**Affiliation:** Universidad Tecnica Federico Santa Maria, Chile |

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| | **SE0451** | **Title:** Adaptive Frequency Coincidence Coordination with Distributed Renewable Energy Sources<br>**Author(s):** Tianchun Xiang, Jian Zheng, Xiaoping Li, Yao Jin, Chaoxu Mu and Tianhao Wang<br>**Presenter:** Xiaoping Li<br>**Affiliation:** Tianjin University, China |
| | **SE0510** | **Title:** A Novel Decentralized Control for Cascaded-Type AC Microgrids Operating in Grid-Connected and Islanded Modes<br>**Author(s):** Xiaogai Ge, Xin Zhang, Xiang Jin, Hao Ma, Jie Tian and Rui Li<br>**Presenter:** Xiaohai Ge<br>**Affiliation:** Zhejiang University, China |
| | **SE0417** | **Title:** Active and Reactive Power Sharing For PV Power Plants with Quasi-Z-source Cascaded H-bridge Multilevel Inverters<br>**Author(s):** Pablo Horrillo-Quintero, Pablo García-Trivio, Raúl Sarrias-Mena, Carlos Andrés García-Vázquez and Luis M. Fernández-Ramírez<br>**Presenter:** Pablo Horrillo-Quintero<br>**Affiliation:** University of Cadiz, Spain |

# Session 45

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: Topology and control of power converters 4 | 电力电子变换器拓扑与控制 4**
**Zoom 6 ID: 86947297263**
**Time: 13:30-15:30 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Assoc. Prof. Meng Huang, Wuhan University, China**

**ORAL**

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| SE0276 | **Title:** Semi-Active Rectifier Based Single-Stage Wireless Battery Charging System with Dynamic Tuning Capability for Electric Vehicles<br>**Author(s):** Xiaoqiang Wang, Xin Zhang, Yongmao Wang, Hao Ma, Jie Tian and Rui Li<br>**Presenter:** Xiaoqiang Wang<br>**Affiliation:** Zhejiang University, China |
| SE0437 | **Title:** Research on an active voltage restorer based on matrix converters in power grids<br>**Author(s):** Yunfeng Shao, Dongliang Liu, Liangliang Zhao, Yang Zhao, Hongmei Wang, Jing Feng, Haipeng Ren and Juan Du<br>**Presenter:** Yunfeng Shao<br>**Affiliation:** Lvliang Power Supply Company of State Grid ShanXi Electric Power Company, China |
| SE0471 | **Title:** State Key Laboratory of HVDC, Electric Power Research Institute China Southern Power Grid<br>**Author(s):** Youjie Shi, Man Chen, Zhipeng He, Peng Peng, Yuxuan Li, Bo Lei<br>**Presenter:** Youjie Shi<br>**Affiliation:** State Key Laboratory of HVDC, Electric Power Research Institute China Southern Power Grid, China |
| SE0487 | **Title:** A Novel Dual Active Forward Converter Based Bidirectional Multiport Converter for EV Applications<br>**Author(s):** Chaitanya Chaudhari, Milind Bagewadi, Sanjay Dambhare<br>**Presenter:** Chaitanya Chaudhari<br>**Affiliation:** College of Engineering Pune, India |
| SE0045 | **Title:** Generalized Study on Analysis and Suppression Strategy of Circulating Current for Modular Multilevel Cascaded Converters<br>**Author(s):** Mengchao He, Yunfei Xu, Zhengang Lu, Guoliang Zhao, Minxiao Han<br>**Presenter:** Mengchao He<br>**Affiliation:** North China Electric Power University, China |
| SE0169 | **Title:** A New Dual-Input Single-Output Step-up DC-DC Converter for Grid-Connected Photovoltaic Applications<br>**Author(s):** Priyabrata Shaw, Muhammad Alam, Yam P. Siwakoti, Dylan Dah-Chuan Lu<br>**Presenter:** Muhammad Alam<br>**Affiliation:** University of Technology Sydney, Australia |

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| | **SE0057** | **Title:** Analysis of Time Domain Loss Model of the LLC Resonant Converter above Natural Resonant Frequency<br>**Author(s):** Tengfei Guo, Pengyu Jia, Xiaoyu Zhu<br>**Presenter:** Tengfei Guo<br>**Affiliation:** North China University of Technology, China |
| | **SE0438** | **Title:** A cascaded H-bridge converter for power transmission between grids with different phases<br>**Author(s):** Zhigang Zhao, Yang Zhao, Wei Li, Yongqiang Liu, Liangliang Zhao, Hui Yun and Juan Du<br>**Presenter:** Yunfeng Shao<br>**Affiliation:** Lvliang Power Supply Company of State Grid ShanXi Electric Power Company, China |

# Session 46

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: Fault diagnosis and protection of power system 3 | 电力系统故障检测及保护控制 3**
**Zoom 1 ID: 82273564217**
**Time: 13:30-15:30 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Asst. Prof. Chenhao Zhang, Xi'an Jiaotong University, China**

**ORAL**

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| SE0285 | **Title:** High Frequency Component-Based Pilot Protection for Photovoltaic Station Collection Line<br>**Author(s):** Yaoyao Zhang, Hulin Liu, Hai Ye, Jun Han, Chenxu Chao and Xiaodong Zheng<br>**Presenter:** Chenxu Chao<br>**Affiliation:** Shanghai Jiao Tong University, China |
| SE0338 | **Title:** A Novel Protection Scheme for LCC-MMC Hybrid Multi-terminal HVDC Transmission Lines<br>**Author(s):** Yi Zhou, Junzheng Cao, Jing Zhao, Yang Li, Chenhao Zhang and Guobing Song<br>**Presenter:** Yang Li<br>**Affiliation:** Xi'an Jiaotong University, China |
| SE0527 | **Title:** Influence of Direct Current bias on Vibration Characteristics of Converter Transformer<br>**Author(s):** Hao Wang, Li Zhang, Youliang Sun, Zhuangzhuang Zhang and Dong Wang<br>**Presenter:** Hao Wang<br>**Affiliation:** Shandong University, China |
| SE0123 | **Title:** Vertical Combustion Characteristics of Cable in Confined Space<br>**Author(s):** Shibin Wang, Xiaojian Lv, Yan Chen, Zhi Yao, Shouxin Zhao and Hui Zhu<br>**Presenter:** Hui Zhu<br>**Affiliation:** Sichuan Fire Research Institute of MEM, China |
| SE0167 | **Title:** A Novel Single-Phase-to-Ground Fault Location Method Based on Phase Current Differences in Power Distribution Systems<br>**Author(s):** Yongle Chang, Jinrui Tang, Yang Li, Binyu Xiong, Xiaotian Lu and Jianchao Liu<br>**Presenter:** Yongle Chang<br>**Affiliation:** Wuhan university of technology, China |
| SE0191 | **Title:** Fault location analysis of distribution networks considering intelligent distributed feeder automation<br>**Author(s):** Bin Wu, Pan Zhang, Yue Zheng, Zhaoyang Wang, Xia Zhou and Tengfei Zhang<br>**Presenter:** Zhaoyang Wang<br>**Affiliation:** Nanjing University of Posts and Telecommunications, China |

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| | SE0201 | **Title:** Pilot Protection based on Cotangent Similarity for Transmission Line with Renewable Energy Sources Connected<br>**Author(s):** Hong Cao, Guosheng Yang, Yue Yu, Hao Zhang and Zhengmao Wang<br>**Presenter:** Hong Cao<br>**Affiliation:** China Electric Power Research Institute, China |
| | SE0226 | **Title:** Fault Analysis of Grid-connected Inverter Station at Fault Initial Stage<br>**Author(s):** Qingrui Tu and Wei Liu<br>**Presenter:** Ruidong Xu<br>**Affiliation:** Xi'an Jiaotong University, China |

# Session 47

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: Artificial intelligence in power systems 2 | 人工智能在电力系统的应用 2**
**Zoom 2 ID: 88531611705**
**Time: 15:45-18:00 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Prof. Yi Tang, Southeast University, China;**
**Assoc. Prof. Yujian Ye, Southeast University, China**

**ORAL**

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| SE0289 | **Title:** Intelligent Fault Diagnosis of Transformer Based on Infrared Image and Mask RCNN<br>**Author(s):** Lintao Sun, Jianjun Wang, Jiangming Liu, Xuanzhe Zhang, Wenyan Li and Chuangxin Guo<br>**Presenter:** Lintao Sun<br>**Affiliation:** Zhejiang electric power company, LTD, China |
| SE0309 | **Title:** Dual-channel wind power forecasting model using squeeze and excitation network<br>**Author(s):** Haonan Li, Bozhen Jiang, Zhengyang Ma, Hua Geng and Yi Liu<br>**Presenter:** Haonan Li<br>**Affiliation:** Zhejiang University of technology, China |
| SE0353 | **Title:** Fast Reliability Assessment of Power Systems Based on Interpretable Autoencoder<br>**Author(s):** Ziheng Dong, Zeyu Liu, Kai Hou, Xiaodan Yu and Qian Xiao<br>**Presenter:** Ziheng Dong<br>**Affiliation:** Tianjin University, China |
| SE0411 | **Title:** A Transformer based Method with Wide Attention Range for Enhanced Short-term Load Forecasting<br>**Author(s):** Bozhen Jiang, Yi Liu, Hua Geng, Huarong Zeng and Jiangqiao Ding<br>**Presenter:** Bozhen Jiang<br>**Affiliation:** Tsinghua University, China |
| SE0088 | **Title:** Research and application of intelligent generation technology of device labels for power Internet of things<br>**Author(s):** Yanwei Wang, Xuan Wang and Pengtian Guo<br>**Presenter:** Yanwei Wang<br>**Affiliation:** China Electric POWER Research Institute, China |
| SE0422 | **Title:** The Digital Transformation Research of Power Standard for "Human-Human Interaction, Human-Machine Interaction and Machine-Machine Interaction" : Key Technologies and Application Scenarios<br>**Author(s):** Chao Ma, Tao Deng, Liyuan Wu, Peng Ding, Yuanyuan Su and Ting Lu<br>**Presenter:** Chao Ma<br>**Affiliation:** China Electric Power Research Institute Co., Ltd, China |

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| | **SE0152** | **Title:** Secure and Efficient V2G Scheme through Edge Computing and Federated Learning<br>**Author(s):** Yitong Shang, Zekai Li, Ziyun Shao and Linni Jian<br>**Presenter:** Linni Jian<br>**Affiliation:** Southern University of Science and Technology, China |
| | **SE0121** | **Title:** Graph Computing Based Electric Power Equipment Defect Grading with Multi-scale Mechanism<br>**Author(s):** Fei Jiao, Zhenyuan Ma, Jiannan Xu, Yuanpeng Tan, Minghui Duan and Jie Tong<br>**Presenter:** Yuanpeng Tan<br>**Affiliation:** China Electric Power Research Institute, China |
| | **SE0467** | **Title:** An Improved DDQN Algorithm for Microgrid Energy Management with Strict Constraints<br>**Author(s):** Guangwei Wong, Chunshui Du and Wenlu Cai<br>**Presenter:** Guangwei Wong<br>**Affiliation:** Shandong University, China |

# Session 48

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: Topology and control of power converters 5 | 电力电子变换器拓扑与控制 5**
**Zoom 3 ID: 87069632470**
**Time: 15:45- 18:15 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Assoc. Prof. Kai Sun, Tsinghua University, China**

**ORAL**

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| SE0459 | **Title:** Interleaved Boost-Integrated LC Series Resonant Converter with Pulse Frequency Modulation for Wide Voltage Range Applications<br>**Author(s):** Hui Wang, Kaiqiang An, Zeyu Wang, Guangfu Ning, Mei Su<br>**Presenter:** Kaiqiang An<br>**Affiliation:** Central South University, China |
| SE0403 | **Title:** Multimode Operation of Dual Active Bridge Converter with Improved Light-load Operation Performance<br>**Author(s):** Shuo Guan, Jianjun Ma, Fan Xiao and Miao Zhu<br>**Presenter:** Shuo Guan<br>**Affiliation:** Shanghai University of Electric Power, China |
| SE0494 | **Title:** Cascaded Resonant RF Drive Design and Soft-Switching Optimization of High-Power Class-E Power Amplifiers<br>**Author(s):** Chen Chen, Hui Wang, Guangfu Ning, Xida Chen, Mei Su<br>**Presenter:** Chen Chen<br>**Affiliation:** Central South University, China |
| SE0259 | **Title:** A Composite Current-Fed LLC Resonant Converter for Wide Input Voltage<br>**Author(s):** Caifeng Liu, Shuang Liu, Donghai Zhu, Xu Yan and Xudong Zou<br>**Presenter:** Caifeng Liu<br>**Affiliation:** Huazhong University of Science and Technology, China |
| SE0260 | **Title:** Power Electronics Converters Topology Derivation with Combination of TopoDiffVAE and Reinforcement Learning<br>**Author(s):** Chenyao Xu, Mi Dong, Li Li, Ruijin Liang and Wenrui Yan<br>**Presenter:** Chenyao Xu<br>**Affiliation:** Central South University, China |
| SE0133 | **Title:** A Non-isolated Three-Level Bidirectional DC-DC Converter with Soft Switching Technique<br>**Author(s):** Yunfeng Xu, Weimin Wu, Jianming Chen, Gang Lu<br>**Presenter:** Yunfeng Xu<br>**Affiliation:** Shanghai Maritime University, China |
| SE0456 | **Title:** Research on Characteristics of SiC FET/Si IGBT and SiC MOSFET/Si IGBT Hybrid Switches<br>**Author(s):** Zixian Zhu, Chunming Tu, Biao Xiao, Liu Long, Fei Jiang, Shuaihu Liu<br>**Presenter:** Zixian Zhu<br>**Affiliation:** Hunan University, China |

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| | **SE0365** | **Title:** A Hybrid Multilevel Converter Topology Based on NPC and CHB Series and Its Control Method<br>**Author(s):** Peng Ren, Chunming Tu, Yuchao Hou, Qi Guo, Zejun Huang and Wenhui Jia<br>**Presenter:** Peng Ren<br>**Affiliation:** Hunan University, China |
| | **SE0126** | **Title:** Learning to Topology Derivation of Power Electronics Converters with Graph Neural Network<br>**Author(s):** Ruijin Liang, Mi Dong, Li Wang, Chenyao Xu, Wenrui Yan<br>**Presenter:** Ruijin Liang<br>**Affiliation:** Central South University, China |
| | **SE0324** | **Title:** Stability and Maximum Output Capacity of Grid Connected VSC under Wide Operating Range<br>**Author(s):** Yuting Zheng, Chunming Tu, Weijie Xie, Fan Xiao, Qi Guo and Pingjuan Ge<br>**Presenter:** Yuting Zheng<br>**Affiliation:** Hunan University, China |

# Session 49

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: Modeling and control of distributed energy sources 4 | 分布式能源及优化控制 4**
**Zoom 4 ID: 83118449166**
**Time: 15:45- 18:00 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Dr. Yuefeng Liao, Zhengzhou University, China**

**ORAL**

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| SE0355 | **Title:** Thermal Analysis and Design of GaN Device of Energy Storage Converter Based on Icepak<br>**Author(s):** Yanping Zhu, Liuhuan He, Hai Zhu, Wei Zhao, Xin Li and Xiaofeng Sun<br>**Presenter:** Jiaxun Teng<br>**Affiliation:** Yanshan University, China |
| SE0032 | **Title:** Independent Photovoltaic Hydrogen System and Control<br>**Author(s):** Xing Zhang, Qiaohua Zhu, Xiangdui Zhan, Siyu Chen, Yuhang Wu, Mengze Wu<br>**Presenter:** Qiaohua Zhu<br>**Affiliation:** Hefei University of Technology, China |
| SE0500 | **Title:** Assessment and Configuration of the Wind-PV-wave Complementary System for Improving the Stability and Power Generation Ability<br>**Author(s):** Yaopeng Huang, Alian Chen, Tong Liu, Wei Wang<br>**Presenter:** Yaopeng Huang<br>**Affiliation:** Shandong University, China |
| SE0012 | **Title:** A Multi-objective Transmission Expansion Model Considering Renewable Energy Resources for Alternating Current Power Systems<br>**Author(s):** Wenhui Pei, Xuexia Zhang, Chuanyu Liu<br>**Presenter:** Wenhui Pei<br>**Affiliation:** Southwest Jiaotong University, China |
| SE0198 | **Title:** Configuration and performance analysis of clean heating systems based on distributed energy conversion technology<br>**Author(s):** Yunxi Yang, Junhong Hao, Shunjiang Wang, Zhihua Ge, Jian Sun, Kexin Wu<br>**Presenter:** Yunxi Yang<br>**Affiliation:** North China Electric Power University, China |
| SE0496 | **Title:** Improvement of Frequency Regulation in AC Microgrid with Adaptive Virtual Inertia Droop Control<br>**Author(s):** Pengcheng Wang, Rui Xie, Zhini Yin, Feng Jiang, Qing Chen, Min Chen<br>**Presenter:** Pengcheng Wang<br>**Affiliation:** Zhejiang University, China |

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| | **SE0095** | **Title:** Stability Analysis of Islanded Microgrid Based on Constant Power Load<br>**Author(s):** Yinghui Li, Zhiwen Zhong, Xingbiao Rong, Peng Huang, Xiaohuan Wang, Zhe Zhang<br>**Presenter:** Zhong Zhiwen<br>**Affiliation:** Yanshan University, China |
| | **SE0357** | **Title:** Robust Real-time Voltage Control Considering Load Uncertainty in High PV-penetrated Distribution Network<br>**Author(s):** Xi Zeng, Lulu Wang, Yuting Hua, Shangpeng Zhong, Hongbin Wu and Hongyun Fu<br>**Presenter:** Xi Zeng<br>**Affiliation:** Anhui Province Key Laboratory of Renewable Energy Utilization and Energy Saving (Hefei University of Technology), China |
| | **SE0005** | **Title:** Control Strategy of Electrolytic Capacitor-Less Multi-port Converter for Suppressing the Influences of Low-Frequency DC-Link Current Ripple<br>**Author(s):** Zihong Zhang, Zhijian Fang, Yuangeng Xia, Hanlin Dong, Haojiang Yue<br>**Presenter:** Zihong Zhang<br>**Affiliation:** China University of Geosciences, China |

# Session 50

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: Power electronic device and its reliability 3|电力电子器件及可靠性3**
**Zoom 5 ID: 815 9467 4058**
**Time: 15:45-18:15 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Prof. Laili Wang, Xi'an Jiaotong University, China; Asst. Prof. Xiang Zhou，Xi'an Jiaotong University, China**

**ORAL**

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| SE0278 | **Title:** Optimization of Intelligent Algorithm for Path Planning of Substation Inspection Robot<br>**Author(s):** Huashen Guan, Haomiao Xin and Guofu Sun<br>**Presenter:** Huashen Guan<br>**Affiliation:** Jiangmen Power Supply Bureau Guangdong Power Grid Co.,Ltd, China |
| SE0346 | **Title:** Multistep Model Predictive Control of Induction Motors for Reducing Switching Frequency<br>**Author(s):** Qingxuan Wang, Yunpeng Zhang, Haidong Cao and Qing Bi<br>**Presenter:** Qingxuan Wang<br>**Affiliation:** Shanghai University, China |
| SE0103 | **Title:** A CFD Study of Deposition Characteristics of Particles in Three-dimensional Heat Transfer Channel with Dimple-type Roughness Elements<br>**Author(s):** Zunshi Han, Hao Lu, Yanmin Zhang, Pengyuan Han, Yongxia Liu, Xuesong Ge<br>**Presenter:** Zunshi Han<br>**Affiliation:** Xinjiang University, China |
| SE0425 | **Title:** Optimization method and Online detection of SSPC transient temperature rise<br>**Author(s):** Li Wang, Jianchao Wu, Xiong He, Jie Wang, Yonggang Chen, Dongping Yang<br>**Presenter:** Jianchao Wu<br>**Affiliation:** Beijing Spacecraft, China |
| SE0426 | **Title:** Dispatching Strategy of Joint Wind, Photovoltaic, Thermal and Energy Storage Considering Utilization Ratio of New Energy<br>**Author(s):** Gejirifu De, Fuqiang Li, Xueqin Tian, Jing Zhang, Yujie Guo, Wenxuan Li, Xinlei Wang, Mingliang Liang, Tong Xu, Jie Ji<br>**Presenter:** Gejirifu De<br>**Affiliation:** State Grid Economic and Technological Research Institute Co., Ltd., China |
| SE0081 | **Title:** Virtual Synchronous Generator Control Under Unbalanced Voltage Condition<br>**Author(s):** Xiaobin Zhang, Jia Shen, Chenxi Huang, Chengkai Li, Yue Li, Sige Xiao<br>**Presenter:** Jia Shen<br>**Affiliation:** Xi'an University of Technology, China |

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| | SE0239 | **Title:** Photovoltaic Hot Spot Fault Warning and Treatment Method Based on Image Processing<br>**Author(s):** Pengwei Zhang, Zhengwei Zhu, Tianwen Zheng, Chengyun Zhang<br>**Presenter:** Pengwei Zhang<br>**Affiliation:** Southwest University of Science and Technology, China |
| | SE0254 | **Title:** A Diagnosis Method of Inverter Open-Circuit Fault Based on Interval Sliding Mode Observer<br>**Author(s):** Jin Li, Youmin Zhang<br>**Presenter:** Jin Li<br>**Affiliation:** Concordia University, USA |
| | SE0251 | **Title:** A novel genetic optimization algorithm for PID control parameter optimization of axial electromagnetic bearing<br>**Author(s):** Suhang Yu, Wenyong Guo, Yuping Teng, Wenju Sang, Chenyu Tian, Yang Cai<br>**Presenter:** Suhang Yu<br>**Affiliation:** University of Chinese Academy of Sciences, China; State Grid He Nan Extra High Voltage Company, China |
| | SE0096 | **Title:** Characteristic Failure Sequence Analysis of IGBT Bonding Wire<br>**Author(s):** Quanjing Zhu, Quan Chen, Quoli Li, Bing Xu, Shule Hou<br>**Presenter:** Quanjing Zhu<br>**Affiliation:** Anhui University, China |

# Session 51

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: Optimal management and control of smart grid 4 | 智能电网优化管理与运行控制 4**
**Zoom 6 ID: 86947297263**
**Time: 15:45-18:00 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Assoc.Prof. Somporn Sirisumrannukul, King Mongkut's University of Technology North Bangkok (KMUTNB), Bangkok, Thailand**

**ORAL**

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| SE0302 | **Title:** A Knowledge Extraction Method Based on Deep Learning Applied to Distribution Network Fault Handing Assistant Decision<br>**Author(s):** Peng Ji, Shuangyuan Jin, Chunxu Li, Shubo Sun and Zhi Li<br>**Presenter:** Shubo Sun<br>**Affiliation:** Northeastern University, China |
| SE0283 | **Title:** Research on Low-carbon Integrated Energy Microgrid Multi-objective Optimal Operation Method<br>**Author(s):** Man Cao, Zhiyong Yin, Jinning Liu, Xin Guo and Yajun Wang<br>**Presenter:** Man Cao<br>**Affiliation:** Army Engineering University Shijiazhuang, China |
| SE0292 | **Title:** Research on Substation Video Surveillance Data Encryption Based on Improved Tent Chaos Map<br>**Author(s):** Qian Gao, Weiliang Zheng, Xue Tao and Jun Teng<br>**Presenter:** Weiliang Zheng<br>**Affiliation:** State Grid Liaoning Electric Power Co., Ltd. Yingkou Power Supply Company, China |
| SE0282 | **Title:** Adaptive Virtual Inertia Control Based on Nonlinear Model Predictive Control for Frequency Regulation<br>**Author(s):** Weimin Zheng, Ruixu Liu, Yangqing Dan and Zhen Wang<br>**Presenter:** Ruixu Liu<br>**Affiliation:** Zhejiang University, China |
| SE0367 | **Title:** Real-Time Optimization for Microgrid Energy Scheduling Based on Approximate Dynamic Programming<br>**Author(s):** Haowei Hao, Yanhong Luo and Dongsheng Yang<br>**Presenter:** Haowei Hao<br>**Affiliation:** Northeastern University, China |
| SE0315 | **Title:** Prediction of Electricity Network Traffic Based on BP Neural Network-Simulated Annealing Algorithm<br>**Author(s):** Xuebin Li, Dongxu Wei, Liang Meng, Dongxu Dai, Manrui Song and Qingyuan Zhao<br>**Presenter:** Dongxu Wei<br>**Affiliation:** State Grid Liaoning Electric Power Co., Ltd. Benxi Power Supply Company, China |

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| | **SE0307** | **Title:** A virtual power plant construction method considering dynamic aggregation of discrete distributed resources<br>**Author(s):** Yang Du, Lingyu Guo, Xingang Yang, Xianghong Xiong, Zhongguang Yang, Jie Yu, Haoyu Hou and Xiaolin Ge<br>**Presenter:** Jie Yu<br>**Affiliation:** Shanghai University of Electric Power, China |
| | **SE0303** | **Title:** A Knowledge Extraction System Based on Weight Optimization Applied and Evaluated to Distribution Network Fault Assistant Decision<br>**Author(s):** Zhi Li, Zhengyi Liu, Yulu Ni, Junbo Feng and Mohan Li<br>**Presenter:** Junbo Feng<br>**Affiliation:** Northeastern University, China |
| | **SE0158** | **Title:** Power flow optimization for island microgrid minimal loss based on virtual impedance<br>**Author(s):** Xiaobin Zhang, Yifan Wen, Chenxi Huang, Yue Li, Sige Xiao and Chengkai Li<br>**Presenter:** Yifan Wen<br>**Affiliation:** Xi'an University of Technology, China |

# Session 52

**December 12, 2022**
**Time Zone: GMT+8**

**Topic: Optimal management and control of smart grid 5 | 智能电网优化管理与运行控制 5**
**Zoom 1 ID: 82273564217**
**Time: 15:45-17:15 (Duration for Each Presentation: 15 minutes)**
**Session Chair: Dr. Aliyu Sabo, Universiti Putra Malaysia (UPM) Serdang, Malaysia**

**ORAL**

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| | **SE0049** | **Title:** Fault location method for distribution network with distributed generation based on deep learning<br>**Author(s):** Shourui Liu, Hong Yin, Yuan Zhang, Xuan Liu and Chunbo Li<br>**Presenter:** Chunbo Li<br>**Affiliation:** Substation maintenance center State Grid Baoding Electric Power Supply Company, China, China |
| | **SE0068** | **Title:** Two-level optimal scheduling strategy of electric vehicle charging aggregator based on charging urgency<br>**Author(s):** Yuanxing Zhang, Xingang Yang, Bin Li, Boyuan Cao, Taoyong Li and Xuan Zhao<br>**Presenter:** Zhang Yuanxing<br>**Affiliation:** China Electric Power Research Institute Co. LTD, China |
| | **SE0143** | **Title:** Reliability assessment of intelligent distributed feeder automation system based on 5G communication<br>**Author(s):** Yue Zheng, Pan Zhang, Bin Wu, Yuanhao Wang, Xia Zhou and Tengfei Zhang<br>**Presenter:** Yuanhao Wang<br>**Affiliation:** Nanjing University of Posts and Telecommunications, China |
| | **SE0429** | **Title:** Design and Application of Digital Twin Model of Power Communication Transmission Network<br>**Author(s):** Xinliu Wang and Shuo Chen<br>**Presenter:** Xinliu Wang<br>**Affiliation:** State Grid Liaoning Electric Power Co., Ltd. Information Communication Branch, China |
| | **SE0424** | **Title:** Cooperative Optimization Strategy between Active Distribution Network and Integrated Energy System Based on Autonomous State Space<br>**Author(s):** Zihao Zhao, Shaoxuan Zhang, Jing Zhang, Weichen Wang, Chunguang He and Shuqiang Yang<br>**Presenter:** Zihao Zhao<br>**Affiliation:** Economic and Technological Research Institute of State Grid Hebei Electric Power Co., China |

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| | SE0145 | **Title:** A switching method of feeder automation control strategy based on 5G communication delay<br>**Author(s):** Pan Zhang, Bin Wu, Yue Zheng, Luze Wang, Xia Zhou and Tengfei Zhang<br>**Presenter:** Luze Wang<br>**Affiliation:** Nanjing University of Posts and Telecommunications, China |

# WIP Forum | 女科学家论坛

**December 10, 2022**
**Time Zone: GMT+8**

**Topic: Facing the Challenges of Novel Power Systems-Inspiring More Female Engineers**
**Zoom 6 ID: 86947297263**
**Zoom 6 Link: https://us06web.zoom.us/j/86947297263**
**Time: 14:30-18:00**
**Host: Assoc. Prof. Tong Wang, North China Electric Power University, China; Prof. Hong Li, Beijing Jiaotong University, China**

**ORAL**

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| #1 | **Opening Remarks**<br>**14:30-14:45**<br>Prof. Ruomei Li, IEEE PES WIP<br>Prof. Hua Geng, Tsinghua University, China<br>Prof. Zhaohong Bie, Xi'an Jiaotong University, China |
| #2 | **Group Photo**<br>**14:45-14:50** |
| #3 | **Invited Speeches (Host: Assoc. Prof. Tong Wang)**<br>**14:50-15:05 |** Prof. Lingling Xu, State Grid Corporation of China DC Technology Center, China<br>**15:05-15:20 |** Prof. Chongru Liu, North China Electric Power University, China<br>**15:20-15:35 |** Prof. Yu Han, State Grid Smart Grid Research Institute Co., Ltd, China |
| #4 | **Panel Discussion (Host: Assoc. Prof. Tong Wang)**<br>**15:35-16:15**<br>**Special Guests:**<br>Prof. Chongru Liu, North China Electric Power University, China<br>Prof. Hong Li, Beijing Jiaotong University, China<br>**Topic 1:** Career Development Issues for Female Scientists<br>**Topic 2:** Impact of Current Policies on Career Development of Female Scientists<br>**Topic 3:** Current Situation and Development of Low-Proportion Women at Senior Levels in Domestic Societies |
| #5 | **Break time**<br>**16:15-16:20** |
| #6 | **Invited Speeches (Host: Prof. Hong Li)**<br>**16:20-16:35 |** Prof. Mingyao Ma, Hefei University of Technology, China<br>**16:35-16:50 |** Prof. Caixia Wang, State Grid Energy Research Institute, China<br>**16:50-17:05 |** Dr. Xiaoqian Li, Tsinghua University, China |

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| | #7 | **University-Enterprise Joint Discussion (Host: Prof. Hong Li)**<br>**17:05-17:45**<br>**Specail Guests:**<br>Prof. Yu Han, State Grid Smart Grid Research Institute Co., Ltd, China<br>Prof. Xiaohui Qu, Southeast University, China<br>**Topic 1:** Bottleneck Problem of Female Engineer's Career<br>**Topic 2:** Obstacles of Communication and Implementation Between Female Teachers and Enterprises<br>**Topic 3:** Employment of Female Postgraduate Students in Enterprises/Proportion of Female Employees in Enterprises |
| | #8 | **Awarding Ceremony**<br>**17:45-17:55**<br>Award 1: Best Paper Award of WIP Forum<br>Award 2: Excellent Women Award in Power |
| | #9 | **Closing Ceremony**<br>**17:55-18:00** |

# 新能源变换控制技术及标准化研讨会

# Control Technology and Standardization for Renewable Energy Conversion

**December 11, 2022**
**Time Zone: GMT+8**

**Zoom ID: 88531611705**
**Zoom Link: https://us02web.zoom.us/j/88531611705**
**Time: 9:00-17:00**
**Host:**
**1. Yongning Chi**, Professorate Senior Engineer, China Electric Power Research Institute;
**2. Hua Geng,** Professor, Tsinghua University, China

**ORAL**

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| 1 | **Welcome address**<br>**09:00-09:05 \| Hua Geng**, Professor, Tsinghua University, China |
| 2 | **Inauguration ceremony**<br>**09:05-09:10 \| Yongning Chi**, Professorate Senior Engineer, China Electric Power Research Institute |
| 3 | **Invited Speeches (Host: Yongning Chi, Professorate Senior Engineer)**<br>**09:10-09:40 \| Huadong Sun**, Professorate Senior Engineer, State Grid Smart Grid Research Institute, China<br>**09:40-10:10 \| Zheng Xu**, Professor, Zhejiang University, China<br>**10:10-10:40 \| Yongning Chi**, Professorate Senior Engineer, China Electric Power Research Institute<br>**10:40-11:10 \| Chao Lu**, Professor, Tsinghua University, China<br>**11:10-11:40 \| Hui Liu**, Professorate Senior Engineer, State Grid Jibei Electric Power Company, China |
| 4 | **Break time**<br>**11:40- 14:00** |
| 5 | **Invited Speeches (Host: Hua Geng, Professor)**<br>**14:00-14:30 \| Jiabing Hu**, Professor, Huazhong University of Science and Technology, China<br>**14:30-15:00 \| Xiaorong Xie**, Professor, Tsinghua University, China<br>**15:00-15:30 \| Xiaohui Qin**, Professorate Senior Engineer,China Electric Power Research Institute, China<br>**15:30-16:00 \| Chenghui Zhang**, Professor, Shandong University, China<br>**16:00-16:30 \| Wei Du**, Vice President, China Haizhuang Research Institute, China<br>**16:30-17:00 \| Xiuqiang He**, ETH, Switzerland |

# 青岛云路先进材料技术股份有限公司

QINGDAO YUNLU ADVANCED MATERIALS TECHNOLOGY CO,. LTD



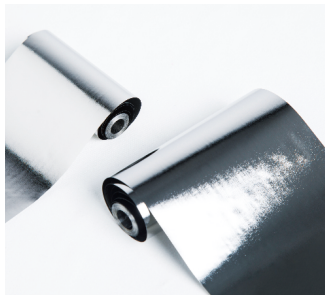


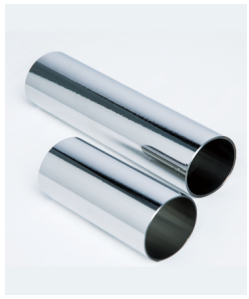

青岛云路先进材料技术股份有限公司成立于2015年12月，是中国航空发动机集团控股的混合所有制企业，注册资本9000万元。

公司自设立以来一直专注于先进磁性材料的研发、生产和销售，已形成非晶合金、纳米晶合金、磁性粉末三大材料及其制品系列。目前，公司非晶合金薄带的市场份额为全球第一。在持续研发新材料产品的同时将产业链向下游延伸，致力于成为围绕先进磁性材料的研发、生产和应用的全产业链综合解决方案提供商。

通过持续研发积累和技术创新，公司自主研发并掌握以“小流量熔体精密连铸技术”等为核心的极端制造技术体系，所制成的磁性材料具有良好的电磁能量转换效率和轻量化特性，主要用于生产节能配电变压器以及电磁能量转换的电子器件等，此类产品具有优异的电磁能量转换效率和功率密度特性，终端产品广泛应用于新能源发电、电力配送、新能源汽车、新基建、消费电子等下游行业领域。

公司注重核心技术的专利保护，累计获得授权专利154项。公司为高新技术企业，核心产品非晶合金的关键技术获得山东省科学技术奖、青岛市科学技术奖等多项奖励。公司曾入选国务院国资委“科改示范企业”百家名单，并获得“国家知识产权优势企业、山东省新材料产业10强、山东省领军企业50强、山东省瞪羚企业、山东省制造业单项冠军”等称号。





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扫码入群

## 远宽故事

远宽能源致力和专注于研发具有完全自主知识产权的实时仿真软硬件产品。电力电子实时仿真因其极高的技术门槛，一直以来处于被国外“卡脖子”的困境。远宽能源认识到实时仿真设备国产化的必要性，带着情怀和使命感组建了一支具有强大技术背景的团队，在短短数年便研发出一款真正破除实时仿真技术壁垒的完全自主的仿真产品，并不断实现突破，成长为率先把实时仿真核心技术软硬件都实现国产化的国内自主品牌，MT系列国产仿真器已经服务了上百家知名大学和企业，受到行业内外的广泛关注。

## 旗舰产品 —— MT 8020


基于高性能的Intel Xeon CPU和 Xilinx UltraScale FPGA的电力超算平台MT 8020实时仿真器，助力**新能源逆变器、多电平变流器、电机驱动系统和微网等电力与电力电子系统**的仿真测试应用。

## 应用场景

### 微电网

1.交流/直流/交直流混合微网仿真
2.船舶微电网仿真
3.能量管理系统测试

### 新能源发电

1.光伏发电系统测试
2.风电发电系统测试
3.储能系统测试

### 多电平电力电子装置

1.电力电子变压器（PET）
2.静止同步补偿器（STATCOM）
3.模块化多电平换流器（MMC）
4.级联H桥高压变频器

### 电气化交通

1.电驱/电机控制系统测试
2.车网系统研究

### 电力系统控制保护

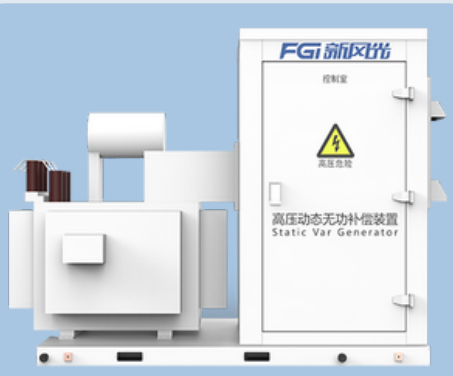
1.典型继电保护装置测试

# FGI 新风光电子科技股份有限公司
WindSun Science & Technology Co.,Ltd.

## 品牌介绍

新风光电子科技股份有限公司（简称：新风光），是世界500强山东能源集团旗下企业，建有山东省电力电子技术及新能源装备院士工作站、 新能源与高效节能国家地方联合工程研究中心等12个科技创新平台，中压链式静止无功发生器T/CPSS 1005—2019团体标准的主要起草审定单位，致力于推动电力电子装备物联各行业，是全球具有核心竞争力的节能及新能源装备研发制造企业。

2000年，新风光与上海交通大学、安徽工业大学联合研制电网无功补偿方法及补偿装置，是国内较早研发单位之一；
2003年，新风光电网无功连续补偿方法及补偿装置（专利号Z00125031.0）获得国家发明专利；
2006年，新风光第一台高压无功补偿设备在淮南矿业投入运行；
2007年，新风光高压动态补偿装置获得中国名牌产品；
2009年，新风光大容量无功功率动态补偿装置性能测试系统（专利号ZL201010190287.0）获得国家发明专利；
2015年，新风光“35kV直挂式SVG 装置”被列入国家火炬计划项目；
2016年，新风光水冷户外SVG装置通过国网电力科学研究院检测；
2018年，新风光百兆级高压水冷SVG成功通过武高所型式试验测试；
2021年，新风光参与的“高比例新能源电力系统电能净化关键控制技术及应用”项目，获得国家科技进步二等奖；
2022年，新风光入选国家知识产权示范企业，是电力电子行业仅有的2家单位之一。



高功率密度SVG


大功率水冷SVG


世界最大单体宁东450M光伏电站


浙江550MW亚洲最大渔光互补光伏项目


“西电东送”青海某330kV汇集站


北京冬奥会延庆赛区SVG项目

少用电 用好电 再生电 储存电 防爆电

节约 能源
服务 社会

爱科赛博
ACTIONPOWER

# 爱科测试 省时省心

光伏逆变器测试 | 储能变流器测试 | 太阳能电池板模拟 | 储能电池/电容模拟等
科研实验测试 | 专业机构检测测试 | 产线检测测试 | 并网验收测试等

## PRE系列
回馈型可编程交流源载一体机
可多台并联 3U、6~20kVA

- 源/载一体全功率四象限，功率硬件在环仿真功能
- 内置多达12种RLC网络模拟功能，满足防孤岛测试
- 电压精度高达0.01%±0.05%F.S.
- 电流精度高达0.1%±0.1%F.S.

## PRO系列
双向可编程直流电源
可多台并联 3U、30kW

- 电压精度高达±0.02%F.S.
- 百us级动态响应时间
- 光伏模拟及电池模拟功能
- 自动源载二者无缝切换

## HGS系列
中压电网模拟源
可多台并联 2~15MW

- 同型号多台并机，最大容量可达15MW
- 高动态，耐压能力强
- 满足中压电网适应性测试
- 带载高穿稳态电压精度高，≤2%Un

可多台并联

## APS系列
光伏模拟器
±100~±1000kW

- 高动态：电压变化速率可达200V/ms
- 四种输出模式：CC恒流、CV恒压、CP恒功率、CR恒阻
- 通用可编程：
  Step、List、Wave三种编程模式，多达200步编程

## ABS系列
电池模拟器
±100~±1000kW

## AGS系列
电网模拟源
75~1000kVA

- 高动态：可进行1ms中断测试
- 闪变模拟：1~10级直接调用
- 高/低电压穿越模拟，穿越最低电压小于5V
- 谐波/间谐波：50次谐波可同时叠加，总谐波含量最可设到40%

爱科赛博官方微信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HOTEAM山大华天

# 电能质量专家

## 山东华天科技集团

提供绿色电能领域的精美产品

让客户的电世界更洁净 更高效 更安全 更可靠

电能质量系列 | 能馈装置系列 | 试验电源系列 | 消防产品系列


柜式/机架式/模块化有源滤波器 · SVG


动态电压恢复器

再生制动能量逆变回馈装置

除以上电能质量治理产品外，华天还研发了： 动态消谐无功补偿装置、动态无功及有源滤波综合补偿装置、谐波保护器、水冷类无功补偿装置、高低压静止无功发生器、三相不平衡治理装置、能量回馈式可编程负载、单相可编程电流源等产品。

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