ZPEC 2025

International Zhejiang Power Electronics Conference

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08/22 – 08/24

2025 | Hangzhou, China

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Welcome Message

On behalf of the Organizing Committee, it is my great pleasure to extend a warm welcome to all of you to the 1st International Zhejiang Power Electronics Conference (ZPEC 2025), which will be hosted by Zhejiang University in the historic and vibrant city of Hangzhou, China, from August 22 to 24, 2025. This conference is organized in partnership with IEEE Power Electronics Society (PELS), China Power Supply Society (CPSS), and IEEE PELS Zhejiang/Jiangsu/Anhui Chapter.

ZPEC 2025 will serve as a premier platform for power electronics engineers, researchers, and students to share cutting-edge advancements in power electronics, energy conversion, and emerging technologies, as well as their transformative applications. The conference will be held in Hangzhou, a dynamic city in China's eastern coastal region, bridging the Yangtze River Delta and Pearl River Delta—a hub for renewable energy, electric vehicles, power supplies, and power semiconductor manufacturing. The program will feature keynote speeches, technical presentations, tutorials, panel discussions, exhibitions, and networking events, bringing together renowned scholars, engineers, and industry leaders. This gathering promises precious opportunities for knowledge exchange, collaboration, and inspiration, highlighting both pioneering research and real-world technological impact.

Hangzhou, a city where ancient heritage meets modern innovation, offers the perfect backdrop for ZPEC 2025. Renowned for its UNESCO-listed West Lake, adorned with willow-fringed shores and historic pagodas, Hangzhou is also a thriving tech hub—often called "China's Silicon Valley". Additionally, it is celebrated for its rich tea culture, being the birthplace of the famous Longjing green tea.

On behalf of the Organizing Committee, we look forward to welcoming you in Hangzhou. Your participation will be instrumental in making ZPEC 2025 a resounding success. We are confident that this conference will be both intellectually rewarding and personally enriching for all attendees.

With best regards,
Dehong Xu
General Chair, ZPEC 2025
IEEE Fellow, Professor of Zhejiang University

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Rongwu Zhu	Harbin Institute of Technology
Wenqi Zhu	Tokyo University of Science
Yinxiao Zhu	Zhejiang University

Agenda Overview

August 22, Friday

13:30–17:00 **Tutorial 1**

Failure Mechanisms and Reliability Assessment of Power Electronic Devices

3F Harvest Room

Tutorial 2

Intelligent DC Solid State Transformers for Distribution Systems: Topology, Modulation, Dynamic and Fault Handling Control

4F Diplomat Boardroom

Tutorial 3

Analysis and Optimization Design of Electromagnetic Interference Characteristics of Magnetic Components in Power Converter

2F Consulate Room

Tutorial 4

Next Generation AI Data Center Power Supply: Topology, Control and Heterogeneous Integration

2F Cinema Five

Tutorial 5

A Paradigm Shift in Control Approaches for Next-Generation Wireless Power Transfer Systems

2F Embassy Room

18:00–20:00 Welcome Reception

2F Window Pavilion Cafe

20:00–21:30 IEEE PELS Young professionals & Women in Engineering Events

17F Narada Tea House

Agenda Overview

August 23, Saturday

08:30–09:00 **Opening Ceremony** 3F Grand Ballroom

Keynote Speech 3F Grand Ballroom

09:00–09:30 Power Electronics Technology – Trends and Applications

Frede Blaabjerg
Aalborg University, Denmark

09:30–10:00 Talkative Power Converters (TPC)–Principles and Applications

Xiangning He
Zhejiang University, China

10:00–10:30 EV Charging: Challenges & Technologies

Udaya K. Madawala
University of Auckland, New Zealand

10:30–10:50 **Coffee Break** 3F Foyer

Keynote Speech 3F Grand Ballroom

10:50–11:20 Challenges and Latest Achievements of Energy Efficiency Solutions for AI Data Center Systems

Alpha J. Zhang
Delta Electronics (Shanghai) Design Center

11:20–11:50 On the Small-Signal Stability and Impedance Passivation in Power Electronics Dominated Future Electrical Grids

Paolo Mattavelli
University of Padova, Italy

11:50–12:20 Research at the SUPER-Lab: Using Piezoelectrics Resonators to Replace Inductors, and Mhz Converter for Medical Imaging Systems

Juan Rivas-Davila
Stanford University, USA

Agenda Overview

August 23, Saturday

12:20–13:30	**Lunch**	
	2F Window Pavilion Cafe	
13:30–15:00	**Poster Session 1**	
	Yuquan Campus, Zhejiang University	
13:30–15:10	Special Session of National Engineering Research Center for Applied Power Electronics	
	3F Grand Ballroom B	
15:10–15:30	**Coffee Break**	3F Foyer
15:30–17:30	**Poster Session 2**	
	3F Grand Ballroom A	
17:00–18:00	**Panel Session 1**	
	Transforming Power Grids: Renewable Energy Systems as Primary Sources	
	3F Grand Ballroom B	
	Panel Session 2	
	AI-Driven Evolution of Data Center Power Supply: Challenges and Opportunities	
	3F Harvest Room	
18:30–21:30	Banquet & Award Ceremony	
	3F Grand Ballroom	

Agenda Overview

August 24, Sunday

07:15–08:15	**Speakers' Breakfast**	
	2F Window Pavilion Cafe	
08:30–10:10	**Technical Session**	
	T01 Grid-Forming & Microgrid – 1	
	3F Harvest Room	
	T02 DC/AC – 1	
	4F Diplomat Boardroom	
	T03 DC/DC – 1	
	2F Cinema Five	
	T04 Device & Module	
	2F Embassy Room	
08:30–10:10	**Industry Session**	
	I01 Power Electronics for Automotive Applications	
	3F Grand Ballroom B	
10:10–10:30	**Coffee Break**	3F Foyer
10:30–12:10	**Technical Session**	
	T05 Grid-Forming & Microgrid – 2	
	3F Harvest Room	
	T06 DC/AC – 2	
	4F Diplomat Boardroom	
	T07 DC/DC – 2	
	2F Cinema Five	
	T08 Renewable Energy & Energy Storage	
	2F Embassy Room	
10:30–12:10	**Industry Session**	
	I02 Power Device, Test & Application	
	3F Grand Ballroom B	
12:10–13:30	**Lunch with Speaker Seat Reserved**	
	2F Window Pavilion Cafe	

Agenda Overview

August 24, Sunday

13:30–15:10	**Technical Session**	
	T09 Grid-Forming & Microgrid – 3 3F Harvest Room	
	T10 EV & Drive – 1 4F Diplomat Boardroom	
	T11 DC/DC – 3 2F Cinema Five	
	T12 Wireless Power Transfer 2F Embassy Room	
13:30–15:10	**Industry Session**	
	I03 Power Electronics for AI Applications 3F Grand Ballroom B	
15:10–15:30	**Coffee Break**	3F Foyer
15:30–17:10	**Technical Session**	
	T13 AC/DC 3F Grand Ballroom B	
	T14 EV & Drive – 2 3F Harvest Room	
	T15 Passive Component 4F Diplomat Boardroom	
	T16 AI for Power Electronics 2F Embassy Room	
17:30–19:30	**Dinner**	2F Window Pavilion Cafe

General information

To fully understand the agenda and related matters of this conference, and ensure the smooth progress of the meeting, please pay attention to the following:

Conference Venue

Zhejiang Narada Grand Hotel
Tel: 0571 8799 0888

Address

No. 122, Shuguang Road, Xihu District, Hangzhou City, Zhejiang Province

Conference Date

August 22- 24, 2025

Registration

09:00 - 21:00 August 22, 2025
08:00 - 18:00 August 23, 2025
08:00 - 12:00 August 24, 2025

Catering (Meals are served with meal vouchers)

August 22

18:00–20:00	Welcome Reception	2F Window Pavilion Cafe
20:00–21:30	IEEE PELS YP & WIE Events	17F Narada Tea House

August 23

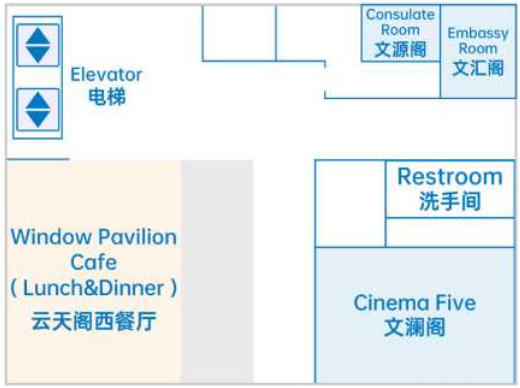
12:20–13:30	Lunch	2F Window Pavilion Cafe
18:30–21:30	Banquet	3F Grand Ballroom

August 24

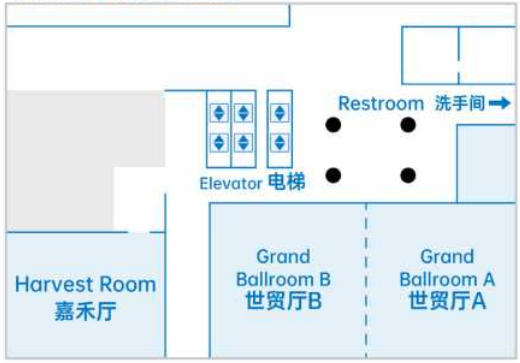
12:10–13:30	Lunch	2F Window Pavilion Cafe
17:10–19:30	Dinner	2F Window Pavilion Cafe

Floor Plan

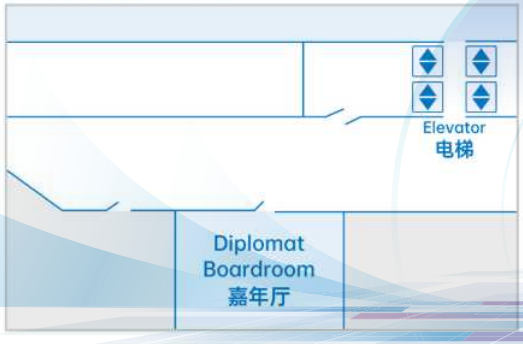
2F Floor Plan



3F Floor Plan



4F Floor Plan



Information for Presenters

Technical Session Presenters

- The duration of an oral presentation slot is 25 minutes (20 minutes for presentation + 5 minutes for Q&A).
- Speakers in Technical Sessions T01–T08 must attend a mandatory orientation with Session Chairs during the Speakers' Breakfast on August 24, 2025, from 7:15 AM to 8:15 AM.
- Speakers in Technical Sessions T09–T16 must attend a mandatory orientation with Session chairs during the Speakers' Lunch on August 24, 2025, from 12:15 PM to 13:15 PM.
- The Program Chair will host the breakfast/lunch at which you will be provided instructions.
- Please get your presentation PPT or PDF files prepared and backed up.
- Laptops, projector & screen, laser sticks will be provided by the conference organizer.

Poster Session Presenters

Poster Session will be held on Saturday afternoon in the Grand Ballroom A. Poster presenters should be available for questions at their display boards during their scheduled poster presentation time. Your poster will be assigned a specific poster board number and section referenced in the Poster Session section of the program. Thumbtacks and stands will be provided on-site.

Badges Required for Admission

Badges are required for admission to all ZPEC events and activities. Badges are obtained by registering with the conference. ZPEC reserves the right to deny admission to any ZPEC event or activity to any person not showing an appropriate badge for that activity or event.

Transportation Information

1. Hangzhou Xiaoshan International Airport

Plan 1: The distance is 35 kilometers, about 50 minutes by taxi, and the fare is about 120 yuan.
Plan 2: Get on Metro Line 19 at Xiaoshan International Airport Station, get off at West Lake Cultural Square Station after 6 stops, transfer to Metro Line 3 in the station, get off at Exit A1 of Huanglongdong Station after 3 stops, and walk 550 meters to the hotel, which takes about 60 minutes.

2. Hangzhou East Railway Station

Plan 1: The distance is 10 kilometers, about 20 minutes by taxi, and the fare is about 30 yuan.
Plan 2: Get on Metro Line 1 at East Railway Station, get off at Wulin Square Station after 4 stops, transfer to Metro Line 3 in the station, get off at Exit A1 of Huanglongdong Station after 2 stops, and walk 550 meters to the hotel, which takes about 30 minutes.

3. Hangzhou Railway Station

Plan 1: The distance is 8 kilometers away, about 25 minutes by taxi, and the fare is about 25 yuan.
Plan 2: Get on Metro Line 1 at Chengzhan Station, get off at Wulin Square Station after 4 stops, transfer to Metro Line 3 in the station, get off at Exit A1 of Huanglongdong Station after taking 2 stops, and walk 550 meters to the hotel, which takes about 30 minutes.

4. Hangzhou West Railway Station

Plan 1: The distance is 20 kilometers away, about 35 minutes by taxi, and the fare about 70 yuan.
Plan 2: Get on Metro Line 3 at Hangzhou West Railway Station, get off at Exit A1 of Huanglongdong Station after taking 15 stops, and walk 550 meters to the hotel, which takes about 45 minutes.

Social Events

Welcome Reception

Time: 18:00–20:00 August 22, Friday
Venue: 2F Window Pavilion Cafe
The conference will kick off with a Friday Welcome Reception to welcome colleagues from academia and industry. The ZPEC 2025 chairs will greet attendees during the event, and you'll have the opportunity to mingle with and thank our corporate sponsors and tutorial speakers.

IEEE PELS YP & WIE Events

Time: 20:00–21:30 August 22, Friday
Venue: 17F Narada Tea House
ZPEC gives you this opportunity to mingle with peers and to learn from big names in power electronics and its applications. The event features: Welcoming by PELS leaders & ZPEC 2025 chairs / Special luminary speeches from ZPEC 2025 keynote speakers / Invited story-sharing sessions. Make sure you don't miss this wonderful chance to make new friends and meet new people.

19:45 – 20:00	Check-in & Welcome Gift Pick-up – guests receive gifts at registration
20:00 – 20:05	Welcome Remarks – by PELS leaders and ZPEC 2025 chairs
20:05 – 20:15	Chat with ZPEC 2025 Keynote Speakers and TPC Co-Chairs – light conversation to set the tone
20:15 – 21:15	Social Networking – mingle, connect, and share ideas with fellow professionals
21:15 – 21:25	Lucky Draw – surprise prizes for a few lucky participants
21:25 – 21:30	Closing Remarks & Group Photo

Banquet & Award Ceremony

Time: 18:30–21:30 August 23, Saturday
Venue: 3F Grand Ballroom
This unique evening brings together attendees and sponsors for a night of networking featuring local Hangzhou delicacies. Join us as we celebrate the recipients of the Best Paper Awards and honor our sponsors for their invaluable support.

Keynote Speakers

Time: 09:00–09:30 August 23, Saturday
Venue: Grand Ballroom

Prof. Frede Blaabjerg

Aalborg University, Denmark
IEEE Fellow, Member of the Danish Academy of Technical Sciences

Power Electronics Technology – Trends and Applications

Abstract

The world is becoming more and more electrified combined with that the consumption is steadily increasing – at the same time there is a large transition of power generation from fossil fuel to renewable energy based which all together challenges the modern power system but also gives many opportunities. We see also now big steps being taken to electrify the transportation – both better environment as well as higher efficiency are driving factors. One of the most important technologies to move this forward is the power electronics technology which has been emerging for decades and still challenges are seen in the technology and the applications it is used. This presentation will be a little forward looking (Quo Vadis) in some exciting research areas in order further to improve the technology and the systems it is used in. Following main topics will be discussed

- The evolution of power devices
- Renewable Generation
- Reliability in power electronics
- Power Electronic based Power System stability

At last some discussions about other hot topics will be given.

Biography

Prof. Frede Blaabjerg (S'86–M'88–SM'97–F'03) was with ABB-Scandia, Randers, Denmark, from 1987 to 1988. From 1988 to 1992, he got the PhD degree in Electrical Engineering at Aalborg University in 1995. He became an Assistant Professor in 1992, an Associate Professor in 1996, and a Full Professor of power electronics and drives in 1998 at AAU Energy. From 2017 he became a Villum Investigator. He is honoris causa at University Politehnica Timisoara (UPT), Romania in 2017 and Tallinn Technical University (TTU), Estonia in 2018.

His current research interests include power electronics and its applications such as in wind turbines, PV systems, reliability, Power-2-X, power quality and adjustable speed drives. He has published more than 800 journal papers in the fields of power electronics and its applications. He is the co-author of ten monographs and editor of twenty books in power electronics and its applications, e.g., the series (4 volumes) Control of Power Electronic Converters and Systems published by Academic Press/Elsevier.

He has received 46 IEEE Prize Paper Awards, the IEEE PELS Distinguished Service Award in 2009, the EPE-PEMC Council Award in 2010, the IEEE William E. Newell Power Electronics Award 2014, the Villum Kann Rasmussen Research Award 2014, the Global Energy Prize in 2019 and the 2020 IEEE Edison Medal. He was the Editor-in-Chief of the IEEE Transactions on Power Electronics from 2006 to 2012. He has been a Distinguished Lecturer for the IEEE Power Electronics Society from 2005 to 2007 and for the IEEE Industry Applications Society from 2010 to 2011 as well as 2017 to 2018. In 2019-2020 he served as a President of IEEE Power Electronics Society. He has been Vice-President of the Danish Academy of Technical Sciences.

He is nominated in 2014-2021 by Thomson Reuters to be between the most 250 cited researchers in Engineering in the world.

Keynote Speakers

Time: 09:30–10:00 August 23, Saturday
Venue: Grand Ballroom

Prof. Xiangning He

Zhejiang University, China
IEEE Fellow

Talkative Power Converters (TPC)–Principles and Applications

Abstract

The large-scale use of power electronic equipment has created new opportunities and challenges for the dual modulation of power and information through power electronic converters. This development is paving the way for a deeper integration of power conversion and communication systems, shaping a new direction in smart power electronic conversion technology. Talkative Power Converters (TPC), named in 2020, represent a significant advancement in this field. It transforms the traditional role of power electronics equipment, which was primarily focused on regulating electrical power, to one that actively participates in information encoding. This report will explores the fundamental concepts and principles of TPC technology, and the typical applications be introduced.

Biography

Prof. Xiangning He received the B.Sc. and M.Sc. degrees from Nanjing University of Aeronautical and Astronautical, Nanjing, China, in 1982 and 1985 respectively, and the Ph.D. degree from Zhejiang University, Hangzhou, China, in 1989.

From 1985 to 1986, he was an Assistant Engineer at the 608 Institute of Aeronautical Industrial General Company, Zhuzhou, China. From 1989 to 1991, he was a Lecturer at Zhejiang University. In 1991, he obtained the Royal Fellowship from the Royal Society of U.K., and conducted research in the Department of Computing and Electrical Engineering, Heriot-Watt University, Edinburgh, U.K., as a Post-Doctoral Research Fellow for two years. In 1994, he joined Zhejiang University as an Associate Professor. Since 1996, he has been a Full Professor in the College of Electrical Engineering, Zhejiang University. He was the Director of the Power Electronics Research Institute, the Head of the Department of Applied Electronics, Vice Dean of the College of Electrical Engineering and he is currently the Director of the National Specialty Laboratory for Power Electronics, Zhejiang University. Dr. He worked as a visiting/guest professor for cooperation research in U.K. in 1997 and 1998, in U.S.A. in 1999 and in Australia in 2002. He is a Fellow of the IEEE and a Fellow of the IET (formerly IEE). His research interest is Power Electronics and its Industrial Applications.

Keynote Speakers

Time: 10:00–10:30 August 23, Saturday
Venue: Grand Ballroom

Prof. Udaya K. Madawala

University of Auckland,
New Zealand
IEEE Fellow

EV Charging: Challenges & Technologies

Abstract

Perceived as one of the most promising means of future transport, Electric vehicles (EVs) are currently gaining wider acceptance. However, there are many challenges in relation to charging techniques and their impact on the grid. Hence, both grid integration and charging techniques of EVs have become one of the main focuses of current research. EVs can be charged either by wired or wireless means, and the latter, based primarily on inductively coupled wireless power transfer (WPT) technology, is becoming increasingly popular being convenient, safe, and ideal for both stationary and dynamic (while moving) EV charging. This seminar discusses the challenges related to EV charging and presents the technologies that have been developed for wireless EV charging applications.

Biography

Prof. Udaya K. Madawala graduated with a B.Sc. (Electrical Engineering) (Hons) degree from The University of Moratuwa, Sri Lanka, and received his PhD (Power Electronics) from The University of Auckland, New Zealand as a Commonwealth Doctoral Scholar. At the completion of his PhD, he was employed as a Research and Development Engineer by Fisher & Paykel Ltd, New Zealand, to develop new technologies for PM motor drives. At present as a Full Professor in the Department of Electrical, Computer & Software Engineering at University of Auckland, New Zealand, he leads a group of researchers focusing on a number of power electronics projects that are related to energy and wireless EV charging systems for V2X applications.

Udaya is a Fellow of the IEEE, and has both industry and research experience in the fields of power electronics and energy. He has served both the IEEE Power Electronics and Industrial Electronics Societies in numerous roles, relating to editorial, advisory, conferences, administrative & technical committees and chapter activities. He was the General Chair of the 2nd IEEE Southern Power Electronics Conference (SPEC)–2016, held in New Zealand, and is also the Chair of SPEC Steering Committee and a Distinguished Lecturer of the IEEE Industrial Electronic Society. He is the recipient of the IEEE PELS Milan M. Jovanovic–Award for Power Electronics Emerging Technology and the University of Auckland Research Excellence Medal in 2024. Udaya, who has over 300 journal and conference publications, holds a family of global patents related to wireless power transfer (WPT) technology and power converters, and is a consultant to industry.

Keynote Speakers

Time: 10:50–11:20 August 23, Saturday
Venue: Grand Ballroom

Dr. Alpha J. Zhang

Delta Electronics (Shanghai) Design Center
IEEE Fellow

Challenges and Latest Achievements of Energy Efficiency Solutions for AI Data Center Systems

Abstract

With the continuous growth of digitalization and data service demands, especially the rapid expansion of data centers for artificial intelligence large-scale model training, the power requirements has been increasing significantly and electricity consumption has become a major operational cost concern. Therefore, improving overall power conversion efficiency and achieving system energy efficiency has become key drivers in data center design. This report will discuss the challenges and latest achievements in power architectures, ranging from the powering of GPU on board-level and supplies at the rack-level to the powering of entire data center system.

Biography

Dr. Alpha J. Zhang was an associate professor in the Electrical Engineering Department at Zhejiang University from 1991 to 1998. He served as a visiting professor at the Center for Power Electronics Systems (CPES), Virginia Tech, USA, in 1995 and 1998.

In 1999, he joined Delta Electronics (Shanghai) Co., Ltd. He is the founder and Director of the Delta Electronics (Shanghai) Design Center (SDC), established in 2002, and the Delta Electronics (Hangzhou) Design Center (HDC), founded in 2007. Under his leadership, multi-disciplinary R&D teams of over 1,000 engineers have supported 15 Delta business units in serving customers worldwide. His expertise spans AC/DC adapters and chargers, High-efficiency DC/DC and AC/DC power converters for servers and networking systems, HVDC power solutions for data center systems, On-board chargers and traction inverters for electric vehicles, PV inverters and energy storage solutions for renewable energy systems, among others. He holds 108 U.S. patents and 133 Chinese patents.

Currently, he serves as Vice President of the China Power Supply Society (CPSS) and is a Fellow of both CPSS and IEEE.

Keynote Speakers

Time: 11:20–11:50 August 23, Saturday
Venue: Grand Ballroom

Prof. Paolo Mattavelli

University of Padova, Italy
IEEE Fellow

On the Small-Signal Stability and Impedance Passivation in Power Electronics Dominated Future Electrical Grids

Abstract

This presentation will explore recent control-oriented research challenges related to small-signal stability and dynamic interactions in future power systems dominated by power electronic converters. Key topics will include impedance-based small-signal stability analysis, self-tuning mechanisms, stability monitoring techniques, impedance specification methods, and unterminated modeling. The impact of advanced oversampled current and voltage control strategies on system stability will also be examined. Various approaches for achieving impedance passivation—particularly through unterminated converter modeling—will be discussed. Special emphasis will be placed on control-oriented solutions for grid-forming technologies. The presentation will illustrate these concepts with examples drawn from diverse scenarios, including lab-scale microgrids, multi-port converters, soft open-point applications, and offshore wind power plants.

Biography

Prof. Paolo Mattavelli received the M.S. degree (with honors) and Ph.D. degree in electrical engineering from the University of Padova, Padova, Italy, in 1992 and in 1995, respectively. From 1995 to 2001, he was a Researcher with the University of Padova. From 2001 to 2005, he was an Associate Professor with the University of Udine, where he led the Power Electronics Laboratory. In 2005, he joined the University of Padova in Vicenza with the same duties. From 2010 to 2012, he was with the Center for Power Electronics Systems (CPES) at Virginia Tech. He is currently a Professor with the University of Padova. His major field of interest includes analysis, modeling and analog and digital control of power converters, grid-connected converters for renewable energy systems and micro-grids, high-temperature, and high-power density power electronics. In these research fields, he has been leading several industrial and government projects. His current google scholar h-index is 81. He served as an Associate Editor for IEEE Transactions on Power Electronics, from 2003 to 2012. From 2005 to 2010, he was the IPCC (Industrial Power Converter Committee) Technical Review Chair for the IEEE Transactions on Industry Applications. For terms 2003-2006, 2006-2009, and 2013-2015 he has been a member-at-large of the IEEE Power Electronics Society's Administrative Committee. He also received in 2005, 2006, 2011, and 2012 the Prize Paper Award in the IEEE Transactions on Power Electronics and in 2007, the 2nd Prize Paper Award at the IEEE Industry Application Annual Meeting. He is a Co-Editor in Chief for IEEE Transactions on Power Electronics.

Keynote Speakers

Time: 11:50-12:20 August 23, Saturday
Venue: Grand Ballroom

Prof. Juan Rivas-Davila

Stanford University, USA

Research at the SUPER-Lab: Using Piezoelectrics Resonators to Replace Inductors, and MHz Converter for Medical Imaging Systems

Abstract

In this talk, I will discuss several ongoing projects at the Stanford University Power Electronics Research Laboratory.

One area of investigation focuses on the use of piezoelectric resonators in power electronics.Many applications, particularly in transportation, require smaller power converters. However, traditional converter designs often fail to meet this demand due to the fundamental scaling limitations of inductors. In this presentation, we will explore how power converters designed around piezoelectric resonators, rather than inductors, can circumvent this bottleneck to achieve high power density. I will cover various control methods and acoustic designs aimed at overcoming two major challenges associated with practical piezoelectric resonator-based DC-DC converters: spurious modes and closed-loop control at high frequencies. We have developed prototype converters that validate these concepts, including an ultra-high power density 3.2 kW, 6.2 MHz DC-DC converter designed for electric vehicle onboard charging.

Additionally, we will examine recent work on MHz converters and their applications in medical imaging.

Biography

Juan Rivas is an Associate Professor in the Electrical Engineering department at Stanford University. Before joining Stanford, he served as an Assistant Professor at the University of Michigan for two years. Prior to his transition to academia, Professor Rivas worked for five years as a senior engineer in the high-frequency power electronics group at the General Electric Global Research Center in Niskayuna, New York.

He completed his undergraduate studies at the Monterrey Institute of Technology in Mexico City and earned both his Master's degree in 2003 and his Doctor of Science degree in 2006 from MIT.

Professor Rivas's research aims to enhance the performance of power supplies, with a particular focus on designing power supplies for medical systems. His research interests include power electronics, RF power amplifiers, resonant converters, soft-switching topologies, and the design of air-core passive components for VHF power conversion.

Tutorial Speakers

Time: 13:30–17:00 August 22, Friday
Venue: 3F Harvest Room

Prof. Laili Wang
Xi'an Jiaotong University, China

Failure Mechanisms and Reliability Assessment of Power Electronic Devices

Abstract

Power electronic devices are fundamental components of new power systems dominated by power electronic equipment. The reliability of these devices directly determines the safe and stable operation of new power systems. This report integrates interdisciplinary research in power electronics, materials science, and artificial intelligence to investigate the short-term overheating failure mechanisms and long-term aging failure mechanisms of power electronic devices, as well as their multi-scale modeling methods. It also explores the characterization, detection methods, and reliability assessment approaches for key state parameters of power electronic devices. The research findings hold significant value for enhancing the health management capabilities of power electronic equipment and advancing the development of new power systems.

Biography

Laili Wang is a Full Professor of Xi'an Jiaotong University. He has authored or coauthored more than 300 papers in IEEE journals and conferences, and has been issued 60 patents. His research interests include wide bandgap power semiconductors, packaging and integration, and high-density power conversion.
Dr. Wang was the recipient of the Gold Medal Award of Geneva Inventions, the First Prize Award of Science and Technology Progress of China Power Supply Society (CPSS), the First Prize of Technical Invention of China Electrotechnical Society (CES), the Second Prize Award of Natural Science of Shaanxi Province, the National Science Fund for Distinguished Young Scholars, the Shaanxi Youth Science and Technology Award, the Outstanding Youth Award of China Power Supply Society (CPSS), the Youth Science and Technology Award of China Electrotechnical Society (CES), and the China Electric Power Excellent Young Technological Talent Award of Chinese Society of Electrical Engineering (CSEE).
He is an Associate Editor for IEEE TRANSACTIONS ON POWER ELECTRONICS and IEEE JOURNAL OF EMERGING AND SELECTED TOPICS IN POWER ELECTRONICS. He is the Co-Chair of System Integration and Application in International Technology Roadmap for Wide Band-Gap Power Semiconductor (ITRW), the Chair of IEEE PELS and CPSS Joint Chapter in Xi'an, and the Vice Chair of IEEE PELS Membership Committee-China. He is also the Vice Chair of the four committees in China Power Supply Society (CPSS).

Tutorial Speakers

Time: 13:30-17:00 August 22, Friday
Venue: 4F Diplomat Boardroom

Prof. Jingxin Hu
Nanjing University of Aeronautics and Astronautics, China

Intelligent DC Solid State Transformers for Distribution Systems: Topology, Modulation, Dynamic and Fault Handling Control

Abstract

This tutorial presents advanced solutions of DC solid-state transformers (SST) for DC distribution systems and microgrid applications, aiming for high-efficiency, high power density, high dynamics, high reliability and high fault tolerance.

The first part will identify the urgent and promising application scenarios of DC SST in the electrical energy systems, and present an overview of development advances in the state-of-the-art DC SSTs. The modular and partial modular topology architectures will be discussed for various voltage levels, and the resonant, non-resonant and even hybrid power cells are examined. Integrated DC SSTs with inherent power/voltage balancing are also presented for bipolar DC grid applications.

The second part will focus on the modulation techniques for enhancing the converter efficiency and boosting transient dynamics of dual-active-bridge (DAB) based DC SSTs. The soft-switching characteristic of both single-phase and three-phase DAB converters will be compared, and intuitive modulation methods to extend the soft-switching range of both converters are introduced, with optimized conduction loss. Instantaneous flux and current control of DAB converters are presented to demonstrate how an ultra-fast and smooth transient can be realized without compromising the device current stress or causing the transformer saturation.

The third part will provide an in-depth discussion on the control of the DC SSTs in extreme operation scenarios such as DC short circuit faults and black start-up. A fault-ride-through scheme is presented to provide a controllable fault current for the fault detection without overstressing the power semiconductor devices. This further leads to discussions of breakerless protection of DC grids based on DC SSTs. Last but not least, to enable a fast recovery, a closed-loop black start-up method is presented, which establishes the DC-link voltage following the trajectory of the maximum allowable current stress.

This tutorial is concluded with the existing challenges and research outlook of DC SSTs.

Biography

Prof. Jingxin Hu received the B.S. degree from Northeastern University, Shenyang, China, in 2010, and the M.Sc. degree and the Dr.-Ing. degree (summa cum laude) from RWTH Aachen University, Aachen, Germany, in 2013 and 2019, all in electrical engineering. He was with ABB Corporate Research Center (Switzerland) in 2012 and General Electric Global Research Center (Germany) from 2013 to 2014. He was a Research Associate (2014-2019) and Senior Scientist (2019-2022) with E.ON Energy Research Center, RWTH Aachen University, Germany.

Since 2022, he has become a Full Professor at Nanjing University of Aeronautics and Astronautics, China. Dr. Hu was a recipient of the Prize Paper Award of IEEE IPEC ECCE Asia in 2018, the STAWAG Best Dissertation Prize of RWTH Aachen University in 2019, and IEEE TPEL Outstanding Reviewer Award in 2021 and 2023. He serves as Guest Editor and Guest Associate Editor of IEEE Transactions on Power Electronics, Associate Editor for the Journal of Power Supply, Technical Program Committee Co-Chair of IEEE eGrid 2020, and Secretary General of IEEE PEDG 2025. His main research interests include solid-state transformers and intelligent energy routers, for renewable power generation and transportation electrification, as well as dc transmission and distribution.

Tutorial Speakers

Time: 13:30–17:00 August 22, Friday
Venue: 2F Consulate Room

Prof. Qingbin Chen
Fuzhou University, China

Analysis and Optimization Design of Electromagnetic Interference Characteristics of Magnetic Components in Power Converter

Abstract

With the development of technology and the improvement of requirements for power converter products, high efficiency, high power density, high reliability, low cost, and low height have become the most critical technical indicators of power converters. At the same time, the standards for conduction emission (CE) and radiation emission (RE) electromagnetic compatibility are the basic requirements that all power converters need to meet. With the increase in switching frequency and power density, the electromagnetic effect of distributed parameters of magnetic components and the near-field coupling effect between devices have become increasingly significant, making the electromagnetic compatibility problem of power converters hard to solve. EMI filters are widely used in practical applications to solve electromagnetic interference problems in power converters. The board area and weight of existing EMI filters account for as much as 30% to 40% of the entire power converter, which has become a key technical bottleneck restricting the further improvement of power density in power converters.

This report starts from the basic countermeasures of electromagnetic interference in power converters and points out the importance of optimizing the design of magnetic components to solve the problem of electromagnetic interference in power converters. Analyzed the influence of parasitic parameters of magnetic components on differential and common mode noise, revealed the mechanism of parasitic parameters of power inductors and transformers from the view side of electromagnetic fields, and proposed corresponding parasitic parameter control methods and evaluation methods. At the same time, a detailed analysis was conducted on the electrical parameter design method of EMI filters and the near-field coupling problem in power converters. Finally, the magnetic components' influence mechanism and evaluation method for the radiated EMI of long cable power converters were introduced. This report aims to provide a new perspective and technical reference for teachers, students, and engineers engaged in electromagnetic compatibility research of power converters by analyzing the mechanism of magnetic components on electromagnetic compatibility and optimizing design methods.

Biography

Prof. Qingbin Chen received his B.E. and Ph.D. in electrical engineering from Fuzhou University, Fuzhou, China, in 2007 and 2012, respectively. He worked as a visiting scholar at the University of Florida, Gainesville, FL, USA, from 2017 to 2018. He is currently a professor and doctoral supervisor at Fuzhou University. He also serves as a member of Magnetic Components and Ferrite Materials (Magnetic Standards Committee of China), Vice Chairman and Deputy Secretary General of the Magnetic Technology Committee of the China Power Supply Society (CPSS), and Director of the Popular Science Education Base of CPSS. He has over 30 SCI/EI publications and 29 patents. His research interests include high-frequency magnetic technology, EMC diagnosis and suppression technology, and wireless power transfer.

Tutorial Speakers

Time: 13:30-17:00 August 22, Friday
Venue: 2F Cinema Five

Prof. Haoyu Wang
ShanghaiTech University, China

Next generation AI Datacenter Power Supply: Topology, Control and Heterogeneous Integration

Abstract

This tutorial presents advanced solutions for high-performance data center power supplies targeting ultra-high step-down ratio, ultra-high current, and ultra-fast dynamics demands.

Part I addresses heterogeneous integration techniques for high-frequency transformers, which are critical for meeting stringent efficiency and power density requirements. While magnetic integration improves performance, it falls short in fully addressing load point-specific challenges. This section explores hybrid circuit integration, winding cancellation techniques for high-current applications, and strategies for integrating magnetic cores, windings, and switching networks.

Part II focuses on resonant switched capacitor circuits tailored for high power density. Capacitors, favored for their high energy density, face limitations due to charging and switching losses. By introducing inductors, hybrid or resonant topologies can significantly mitigate these losses. The session explains the principles of resonant switched capacitor circuits, analyzes a two-stage cascaded structure, and proposes a voltage gain adjustment method enabling closed-loop control.

Part III provides an in-depth review of trans-inductor voltage regulator (TLVR) converters for data center point-of-load applications. A multi-phase series-capacitor TLVR with constant on-time control is introduced. This architecture splits input voltage across Buck cells, halving voltage stress while doubling the step-down ratio and duty cycle. Its indirectly coupled output inductors and low transient inductance enable ultra-fast dynamic response. Small-signal modeling via the describing function method accurately predicts system behavior, validated through SIMPLIS simulations and experimental results, offering insights for controller optimization.

Biography

Prof. Haoyu Wang received the bachelor's degree with Distinguished Hons. from Zhejiang University, Hangzhou, China, in 2009, and the Ph.D. degree from the University of Maryland, College Park, MD, USA, in 2014, both in electrical engineering.

In 2014, he joined the School of Information Science and Technology, ShanghaiTech University, where he is currently a Full Professor with tenure. In 2023, he was a Visiting Academic Fellow with the University of Cambridge, U.K. His research interests include power electronics, electric vehicles, renewable energy systems, and power management integrated circuits.

Dr. Wang is an IET Fellow. He serves as an Associate Editor of IEEE Transactions on Industrial Electronics, IEEE Transactions on Transportation Electrification, and CPSS Transactions on Power Electronics and Applications. He was a Guest Associate Editor of IEEE Transactions on Power Electronics.

Tutorial Speakers

Time: 13:30–17:00 August 22, Friday
Venue: 2F Embassy Room

Dr. Jiayang Wu
Research Assistant Professor
City University of Hong Kong, China

A Paradigm Shift in Control Approaches for Next-Generation Wireless Power Transfer Systems

Abstract

This tutorial examines the evolution of the Qi wireless power transfer (WPT) standard, launched in 2010, which aims to maximize compatibility among manufacturers through diverse transmitter and receiver designs. The Wireless Power Consortium (WPC) is expanding WPT applications to mid- and high-power levels, reaching several kilowatts, while the Society of Automotive Engineers (SAE) has established standards for wireless charging of electric vehicles up to tens of kilowatts. A crucial paradigm shift from compatibility to optimal performance is necessary, focusing on maximizing energy efficiency and minimizing charging time.

The tutorial introduces various methods to enhance energy efficiency during the battery charging process and reduce charging duration. It critiques traditional constant-current and constant-voltage modes due to thermal limitations, advocating for temperature-regulated current control as a more effective approach. The importance of using an electro-thermal battery model for optimal control is also emphasized. Additionally, the tutorial outlines how primary-side control can achieve these performance enhancements and discusses the development of real-time battery observers as part of digital twins to support optimal performance control. The session concludes with a summary of the proposed paradigm shift in WPT applications.

Biography

Jiayang Wu received the B.Eng. degree in Electrical Information Engineering from Zhejiang University, Hangzhou, China, in 2017, and the Ph.D. degree in Electrical and Electronic Engineering from The University of Hong Kong, Hong Kong, in 2022. She has worked as a Research Fellow at the School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore in 2023. Following this role, she held the position of a Research Assistant Professor with the Department of Electrical and Electronic Engineering at The University of Hong Kong, Hong Kong in 2024.

She is currently a Research Assistant Professor in Department of Electrical Engineering, City University of Hong Kong, Hong Kong. She was a recipient of the Best Paper Award (Second Place) of the IEEE TRANSACTIONS ON POWER ELECTRONICS in 2019 and 2023, and the Best Presentation Award of the IEEE Applied Power Electronics Conference and Exposition in 2024. Her current research interests include wireless power transfer, electric vehicle charging, resonant converters, and renewable energy.

Panel Speakers

Panel Discussion – 1

Transforming Power Grids: Renewable Energy Systems as Primary Sources

Time: 17:00 – 18:00 August 23, Saturday
Venue: 3F Harvest Room

Moderator
Yongheng Yang
Zhejiang University

Jingyang Fang
Shandong University

Jingyang Fang is the Full Professor of School of Control Science and Engineering, Shandong University. His research interests include power quality control, stability analysis and improvement, renewable energy integration, and digital control in more-electronics power systems.

Linbin Huang
Zhejiang University

Linbin Huang is a ZJU100 Professor of Zhejiang University。His research interests include synchronization stability of power electronics converters, design and configuration of grid-forming converters, and data-driven control of grid-connected converters.

Yitong Li
Xi 'an Jiaotong University

Yitong Li is a professor at School of Electrical Engineering, Xi' an Jiaotong University, China. His current research interests include grid-forming control of power electronic inverters, stability analysis of power systems dominated by inverter-based resources, numerical simulation and calculation of power systems, etc.

Panel Speakers

Panel Discussion – 2

AI-Driven Evolution of Data Center Power Supply: Challenges and Opportunities

Time: 17:00 – 18:00 August 23, Saturday
Venue: 4F Diplomat Boardroom

Moderator
Yenan Chen
Zhejiang University

Ping Wang
The Hong Kong University of Science and Technology

Ping Wang is an Assistant Professor of HKUST. His research focuses on developing high-performance power electronics for emerging energy systems and applications, such as AI chip power delivery, data centers, electric vehicles, and renewable energies.

Xin Lou
Silergy Technology

Xin Lou is the manager for the DrMOS team at Silergy Technology. He is leading the development of Silergy's DrMOS for computing, automotive and consumer applications. In addition, Xin Lou is working with multi-functional teams internally to provide advanced power solutions for datacenters and AI infrastructure.

Youzhun Cai
Delta Electronics Hangzhou Design Center

Youzhun Cai currently serves as R&D Director for Data Center Power Supply at the Delta Electronics Hangzhou Design Center. With experience in the power electronics field since 2012, he is an expert in server/networking and data center power solutions.

Tutorials

13:30 – 17:00 August 22, Friday

Failure Mechanisms and Reliability Assessment of Power Electronic Devices

Laili Wang
Xi'an Jiaotong University

3F Harvest Room

Intelligent DC Solid State Transformers for Distribution Systems: Topology, Modulation, Dynamic and Fault Handling Control

Jingxin Hu
Nanjing University of Aeronautics and Astronautics

4F Diplomat Boardroom

Analysis and Optimization Design of Electromagnetic Interference Characteristics of Magnetic Components in Power Converter

Qingbin Chen
Fuzhou University

2F Consulate Room

Next generation AI datacenter Power Supply: Topology, Control and Heterogeneous Integration

Haoyu Wang
ShanghaiTech University

2F Cinema Five

A Paradigm Shift in Control Approaches for Next-Generation Wireless Power Transfer Systems

Jiayang Wu
City University of Hong Kong

2F Embassy Room

Keynote Speeches

08:30–09:00 **Opening Ceremony** **3F Grand Ballroom**

Chair: Yongheng Yang | Zhejiang University

Keynote Speech **Chair:** Junming Zhang | Zhejiang University
Meiqin Mao | Hefei University of Technology

09:00–09:30 Power Electronics Technology – Trends and Applications

Frede Blaabjerg
Aalborg University, Denmark

09:30–10:00 Talkative Power Converters (TPC)–Principles and Applications

Xiangning He
Zhejiang University, China

10:00–10:30 EV Charging: Challenges & Technologies

Udaya K. Madawala
University of Auckland, New Zealand

10:30–10:50 **Coffee Break** **3F Foyer**

Keynote Speech **Chair:** Wuhua Li | Zhejiang University
Alian Chen | Shandong University

10:50–11:20 Challenges and Latest Achievements of Energy Efficiency Solutions for AI Data Center Systems

Alpha J. Zhang
Delta Electronics (Shanghai) Design Center

11:20–11:50 On the Small-Signal Stability and Impedance Passivation in Power Electronics Dominated Future Electrical Grids

Paolo Mattavelli
University of Padova, Italy

11:50–12:20 Research at the SUPER-Lab: Using Piezoelectrics Resonators to Replace Inductors, and MHz Converter for Medical Imaging Systems

Juan Rivas-Davila
Stanford University, USA

Special Session
National Engineering Research Center for Applied Power Electronics

Chair: Heng Nian | Zhejiang University
Junming Zhang | Zhejiang University
Time: 13:30–15:10 August 23, Saturday
Venue: 3F Grand Ballroom B

13:30–13:50 High-Granularity Management and Control Technology for Battery Energy Storage Systems
Rui Li
Shanghai Jiao Tong University

13:50–14:10 PV/BESS Power Converters and Grid-Forming Control
Peng Sun
Sungrow Power Supply Co., Ltd.

14:10–14:30 A Smooth Generalized Discontinuous PWM Strategy for Current Oscillation Suppression in a Three-Phase Voltage Source Inverter
Lijun Hang
Hangzhou Dianzi University

14:30–14:50 The Grid Connection Technology for Doubly-Fed Wind Power Converters
Zhijian Zhao
Windey Energy Technology Group Co., Ltd.

14:50–15:10 Chint Power Grid-Forming Converter Technology and Application Practice
Yulin Zhang
Chint Green Energy

Panel Sessions

Session – 1: Transforming Power Grids: Renewable Energy Systems as Primary Sources

Moderator: Yongheng Yang | Zhejiang University
Time: 17:00 – 18: 00 August 23, Saturday
Venue: 3F Grand Ballroom B

17:00–17:05 Introduction
Yongheng Yang Zhejiang University

17:05–17:15 Control of Grid-Forming Converters
Jingyang Fang Shandong University

17:15–17:25 Design and Configuration of Grid-Forming Devices to Enhance Stability of Renewable Power Systems
Linbin Huang Zhejiang University

17:25–17:35 The Extension of Grid-Forming Control of Power Electronic Inverters
Yitong Li Xi'an Jiaotong University

17:35–18:00 Discussion

Session – 2: AI-Driven Evolution of Data Center Power Supply: Challenges and Opportunities

Moderator: Yenan Chen | Zhejiang University
Time: 17:00 – 18: 00 August 23, Saturday
Venue: 3F Harvest Room

17:00–17:05 Introduction
Yenan Chen Zhejiang University

17:05–17:15 Powering the AI Data Centers: Architectures, Controls, and the Road Ahead
Ping Wang
The Hong Kong University of Science and Technology

17:15–17:25 Challenges and opportunities in powering Vcore of AI infrastructure
Xin Lou Silergy Technology

17:25–17:35 Power Architecture Trend of AI Data Center
Youzhun Cai
Delta Electronics Hangzhou Design Center

17:35–18:00 Discussion

August 23, Saturday

Poster Sessions

P01 Poster Session – 1

Chair: Min Chen | Zhejiang University
Time: 13:30 – 15:00 August 23, Saturday
Venue: Yuquan Campus, Zhejiang University

P01.1 Loss Modeling and Comparison for 2000-V Three-Level Photovoltaic Inverter
Yuxiang Fan; Yenan Chen
Zhejiang University

P01.2 Preference-Based Multi-Objective Optimization of Laminated Coupler in Wireless Charging System
Hao Liu; Henglin Chen
Zhejiang University

P01.3 Loss Characterization in Hybrid Switched-Capacitor Converters with Zero Current Switching
Rui Xu; Yenan Chen
Zhejiang University

P01.4 Preference-Driven Multi-Objective Optimization for Novel Coil Architectures in Wireless Power Transfer Systems
Dan Chen; Hao Liu; Henglin Chen
Zhejiang University

P01.5 Design of Dual-Frequency Dual-Channel Wireless Charging System
Hongfa Li; Hao Liu; Henglin Chen
Zhejiang University

P01.6 Comparative Analysis of Boost Converters in 2000-V String PV Inverter
Yuan Zhang; Yenan Chen
Zhejiang University

P01.7 Frequency Support of Photovoltaic Clusters Operating as Virtual Energy Storage
Wei Liu; Kai Yin; Yongheng Yang
Zhejiang University

P01.8 A De-Skew Method for SiC MOSFET Gate-Source Voltage Waveforms
Haoran Zhao[1]; Junze Li[1]; Yifan Wang[2]; Mingquan Zeng[2]; Qing Guo[1]; Kuang Sheng[1]
[1]Zhejiang University; [2]State Grid Zhejiang Electric Power Co., Ltd.

P01.9 Modeling Switching Voltage Waveforms of IGBT Modules under Wide Current Range
Yuxiang Liu; Zili Zhu; Junhao Chang; Henglin Chen
Zhejiang University

P01.10 Analysis and Evaluation of Suppression Methods for Different Resonant Frequencies in Dual-Inertia Systems
Mengguang Zhang[1]; Qianru Lin[1]; Liang Cao[2]; Zhihao Song[2]; Wenxi Yao[1]
[1]Zhejiang University;
[2]Leadrive Technology (Hangzhou) Co., Ltd.

P01.11 Research on Narrow Pulse Clamping and Residual Compensation Method for Two-Level Inverter
Qianru Lin[1]; Wenxi Yao[1]; Chen Jia[2]
[1]Zhejiang University; [2]State Grid Liaoning Electric Power Co., Ltd.

P01.12 Equivalent Impedance Model of Modular Multilevel Converter Considering Internal Dynamics and Current Control
Fan Yang; Jingyuan Wen; Hongyi Chen; Heya Yang; Xin Xiang; Wuhua Li
Zhejiang University

P01.13 Design of Three-Coil WPT System with Wide Range Misalignment Tolerance Based on Generalized Impedance Matrix
Huang Tianhao[1]; Zhong Wenxing[2]
[1]Zhejiang University; [2]Ningbo University

P01.14 A Calculation Method for the Open-Circuit Voltage and Short-Circuit Current of Photovoltaic Cells Based on Theoretical Model
Fan Zhang[1]; Celiang Deng[1]; Jiawei Zang[2]; Jianyu Lan[2]; Min Chen[1]; Feng Jiang[1]
[1]Zhejiang University; [2]Shanghai Institute of Space Power-Sources

P01.15 Active Power Distribution System for the Electric Vehicle Charging Station
Haitao Wang; Min Chen; Jiahui Li; Yi Zhou; Haihong Long; Changsheng Hu; Dehong Xu
Zhejiang University

P01.16 Performance Evaluation of SiC Three-level Inverters
Ziang Sun; Qingzheng Zhang; Cheng Peng; Haihong Long; Dehong Xu
Zhejiang University

August 23, Saturday

P02 Poster Session – 2

Chair: Wenxi Yao | Zhejiang University
Chi-Sheng Lam | University of Macau
Time: 15:30 – 17:30 August 23, Saturday
Venue: 3F Grand Ballroom A

P02.1 Advanced Thermal Modelling of Fuse Based on TCC

Mengqi Xu; Haiwen Ge; Wei Hua
Zhejiang Lab

P02.2 Comparison of Thermal Behavior of Press-Pack IGBT Devices under Fault Scenarios in VSC-HVDC and LCC-VSC Systems

Huixian Shen; Jun Zhang; Zhihuan Wang; Yi Zheng
Hohai University

P02.3 Study on the Self-adjustable P+-emitter FSRD with Injections of Backside Hole

Hongchao Zhang; Lin Liang; Kaijun Wen; Ke Wang
Huazhong University of Science and Technology

P02.4 Comparative Analysis on Two Five-Level LLC Resonant DC-DC Converter Topologies

Haoran Jiang[1]; Longlong Zhang[1]; Cheng Cheng[1]; Wei Yu[2]; Jingcheng Zhao[1]; Shiyu Ji[1]; Haining Li[1]; Qinrong Zhang[1]
[1]China University of Petroleum(East China); [2]EAST Group Limited Co. Ltd.

P02.5 Topology and Control Strategy of an ISOP-LLC Cascaded with Buck Converter for Seafloor Observation Network

Bing Jiang; Jiaxing Lei; Shuang Feng; Lei Huang; Yuyang Ji; Zirui Qin
Southeast University

P02.6 A Novel Non-Isolated Three-Port DC-DC Converter for Photovoltaic Applications

Zheng Xu; Qingsong Wang
Southeast University

P02.7 Hybrid Current Limiting Control for MMC-HVDC Power Grid at DC Short-Circuit Fault

Meiqin Mao[1]; Xun Jiang[1]; Chao Sun[1]; Liuchen Chang[2]; Xing Ge[1]; Yong Shi[1]
[1]Hefei University of Technology;[2]University of New Brunswick

P02.8 Impedance Modeling and Stability Analysis of Three-Phase Four-Leg Grid-Connected Inverter Considering Frequency Coupling Under Unbalanced Grid

Jiachen Sun; Zhao Liu
Nanjing University of Science and Technology

P02.9 An Adaptive Unbalanced Voltage Operation Control Strategy for HC-TLBC Topology

Miaojie Chen[1]; Luyao Xie[1]; Bo Wang[2]; Yi Chen[3]; Yuxin Tian[2]; Feiyu Fang[2]
[1]Zhejiang University of Technology; [2]HRV ELECTRIC; [3]Zhijiang College of Zhejiang University

P02.10 Control-Function Implementation Options for the Non-Inverting Buck-Boost Y-Inverter

Vanesa Yarazet Vera Placido; Yonghwa Lee; Alberto Castellazzi
Kyoto University of Advanced Science

P02.11 An AC-AC Converter Topology with Low Voltage Stress on Transistors

Bingkun Li[1]; Jiaxing Lei[1]; Shuang Feng[1]; Zhishuang Wang[2]; Bowen Guo[2]; Hao Xiao[3]
[1]Southeast University; [2]State Grid Tianjin Electric Power Company; [3]Chinese Academy of Sciences

P02.12 A Novel Command Current Feed-forward Compensation Control Strategy with DPTLs for Gradient Power Amplifier

Long Chen; Tinglang Zou; Haiying Xu
Ningbo Polytechnic University

P02.13 Thyristor Branch-Assisted Modular Multilevel Converter for DC Short-Circuit Faults

Dongwei Yu[1]; Tingshu Zhu[1]; Lei Li[1]; Gen Li[2]; Siyu Xiao[1]; Xiongfeng Fang[1]
[1]Nanjing University of Science and Technology; [2]North China Electric Power University

August 23, Saturday

P02.14 A Multi-Objective Improved Space Vector Modulation Method for Three-Level Inverter

Jiakai Gan; Zhong Chen; Zixuan Liu; Yang Ma; Renyu Li
Nanjing University of Aeronautics and Astronautics

P02.15 Grid Voltage Estimation and Active Damping for Three-Phase Grid-Connected Inverter

Chao Zhu; Zuohang Hu; Xiangyang Xing
Shandong University

P02.16 Research on Multi-Port Collaborative Network Based on High-Order Generalized Averaging Method

Siyu Xiao[1]; Lei Li[1]; Cheng Wang[1]; Xiongfeng Fang[1]; Dongwei Yu[1]; Gen Li[2]
[1]Nanjing University of Science and Technology; [2]North China Electric Power University

P02.17 Sequence Impedance Modeling-Based Stability Analysis of Grid-Connected Parallel VSGs with Centralized Control

Qinqin Gu; Zhao Liu
Nanjing University of Science and Technology

P02.18 Low-Frequency Power Oscillation Study of VSG-Controlled Converter in Hybrid GFM/GFL Systems Based on [P Q]-[ω V] Model

Guohua Liang; Xiaoqiang Li; Jinlong Wang; Ruiru Wang; Xiaojie Wu
China University of Mining and Technology

P02.19 On-Line Impedance Measurement Method of Three-Phase Power Network under Unbalanced Condition

Jiajie Fu; Zhao Lu
Nanjing University of Science and Technology

P02.20 Design of Direct Power Control of Hybrid Grid-Connected Inverter for Renewable Energy Generation with Power Quality Conditioning

Wai-Kit Sou; Qiannan Jiang; Rui P.Martins; Chi-Seng Lam
University of Macau

P02.21 Multi-Layer Control of Partial Power Interlinking Converters for DC Microgrid Clusters

Chao Wang; Sucheng Liu; Kai Huang; Maomao Song; Qianjin Zhang; Xiaodong Liu
Anhui University of Technology

P02.22 Reactive Power Compensation Strategy Based on LADRC-SVG

Chenxin Zheng; Damin Zhang; Hanchao Zeng; Jiongqiong Cao; Binbin Chen
Xiamen University of Technology

P02.23 PLL-based State Feedback Control for GFM connected to DR-HVDC with Improved Frequency Response Characteristic

Xingyu Pei[1]; Yi Chen[2]; Hongyuan Wu[1]; Jianbiao Li[1]; Xu Cheng[1]; YueBin Zhou[3]; YiLiang Xu[3]; Huan Yang[2]
[1]Zhuhai Power Supply Bureau Guangdong Power Grid Co., Ltd.; [2]Zhejiang University; [3]CSG Electric Power Research Institute (CSG EPRI)

P02.24 Vehicle-to-Grid with Secondary Frequency Regulation in Power Systems: A Review of Advances and Challenges

Qiang Zhang; Guanguan Zhang; Alian Chen
Shandong University

P02.25 Research on Fault Location Algorithm for Distributed Power Sources Based on Wide-area Measurement Information

Longlong Zhang[1]; Guochen Zhu[1]; Yansong Wang[1]; Shan Liu[2]; Lei Wu[3]; Fengjie Yin[3]
[1]China University of Petroleum (East China); [2]State Grid Suzhou Electric Power Company; [3]New Energy Development Center of Sinopec Shengli Petroleuw Administration Bureau Co., Ltd.

August 23, Saturday

P02.26 Research on the Impact of Power and Impedance Distribution in New Energy Stations on the Equivalent Accuracy of Multiplication Models

Jianwu Wang[1]; Jinchuan Guo[1]; Yang Huang[1]; Weihan Hao[1]; Yiping Lu[2]; Zehao Wang[2]
[1]China Energy Engineering Group Guangdong Electric Power Design Institute Co., Ltd.; [2]State Key Laboratory of HVDC, Electric Power Research Institute

P02.27 Modeling and Stability Analysis of DFIG-Based Wind Farm Using Harmonic State Space Theory

Xinyu Ji[1]; Hailiang Xu[1]; Hankai Liu[1]; Xianglong Kong[1]
[1]China University of Petroleum (East China)

P02.28 An Adaptive Carrier Phase-Shifted Balanced Modulation Method for Low Modulation Ratio Applications in Cascaded Energy Storage Systems

Dexing Sun[1]; Jionghui Wei[1]; Bin Yi[2]; Jieming Huang[1]; Xiaorong Huang[1]; Xiaotian Qin[2]
[1]Dongguan Power Supply Bureau of Guangdong Power Grid Corporation; [2]National Institute of Guangdong Advanced Energy Storage

P02.29 Study on Coupling Mechanisms and Electromagnetic Environment in Wireless Power Transfer Systems

Feng Wen; Aonian Li; Xiangyi Zhao; Dewei Wang; Jiaqi Guo
Nanjing University of Science and Technology

P02.30 Research on the Early Fault Identification of Transmission Lines Based on Partial Discharge

Cheng Wu1; Yuhong Wu[2]; Jinwei Lin[1]; Mingjie Xu[1]; Tao Ji[1]
[1]Deqing Power Supply Company, State Grid Zhejiang Electric Power Co., Ltd.; [2]Deqing Xindian Electric Power Construction Co., Ltd.

P02.31 Parameter-Efficient Language Model for BOM Classification in Automated Power Electronics Design

Jiahua Ying; Bowen Su; Ran Ou; Huan Chen; Kai Sun
Tsinghua University

P02.32 A Back-to-Back Three-Phase Bridge-Based Operational Condition Simulation Method for Permanent Magnet Synchronous Motor Drives

Haixiang Zhang[1]; Fei Wang[1]; Xiaokang Zhang[1]; Lintao Ren[2]
[1]Shanghai University; [2]Panxin Technology (Shanghai) Co., Ltd.

P02.33 Research on Modeling of Low Temperature Preheating System of Power Battery Based on Electric Drive System

Zhuo Chen; Jie Shen
Shanghai DianJi University

P02.34 Application of CM Active EMI Filter Considering Insertion Loss and Power Consumption

Yongxing Zhou[1]; Liang Shu[1]; Yigang Lin[1]; Yingmin You[1]; Ziran Wu[1]; Wei Chen[1]; Xiao Han[2]; Ruru Zheng[3]
[1]Wenzhou University; [2]China Academy of Information and Communications Technology; [3]Yandangshan Institute of Electrical Technology

August 23, Saturday

Industry Sessions

I01 Power Electronics for Automotive Applications

Chair: Guoqiao Shen | BOCO Electronics Co., Ltd.
Sheng Zheng | Huawei Digital Power
Time: 8:30–10:10 August 24, Sunday
Venue: 3F Grand Ballroom B

08:30–08:55 I01.1
Approaches, Achievements and Challenges of High-Density OBC
Yongkai Liao
Delta Electronics, Inc.

08:55–09:20 I01.2
New Package, New Topology Enable Electric Drive-Train Innovation
Tornado Zhang
Infineon Technologies

09:20–09:45 I01.3
Leapmotor's Electric Drive System Technology Roadmap and Portfolio
Feifan Ji
Leapmotor

09:45–10:10 I01.4
EV Relate Test Application
Jordan Lee
Ding Wei Electronics

I02 Power Devices, Testing, and Applications

Chair: Haoze Luo | Zhejiang University
Wei Liu | Firstack
Time: 10:30–12:10 August 24, Sunday
Venue: 3F Grand Ballroom B

10:30–10:55 I02.1
Automotive Traction Power Module Packaging: Status and Trends
Zhihong Liu
StarPower Semiconductor Ltd.

10:55–11:20 I02.2
Domestic MCU Helps the Development of Power Electronics Industry
Yajie Wu
Zhuhai Tai-Action Electronics Co., Ltd.

11:20–11:45 I02.3
Advanced Thermal Management Design for Highly Integrated IPM
Junwei Yu
Silan Microelectronics Co., Ltd.

11:45–12:10 I02.4
Application of Power Hardware-in-the-Loop (PHIL) Simulation in Microgrid Research
Jiwei Zhao
Shanghai Changce Electronic System Co., Ltd.

August 24, Sunday

I03 Power Electronics for AI Applications

Chair: Yenan Chen | Zhejiang University
Junming Zhang | Zhejiang University
Time: 13:30–15:10 August 24, Sunday
Venue: 3F Grand Ballroom B

13:30–13:55 I03.1
Power Electronics-Driven Evolution of Power Delivery Architectures for AIGC Data Centers
Jiabin Zhang
Tencent

13:55–14:20 I03.2
48V Total Power Solutions for Data Center
Milo Zhu
Joulwatt Technology Co., Ltd.

14:20–14:45 I03.3
ITECH Data Centers Test Solutions
Queena Qi
ITECH Electronic Co., Ltd.

14:45–15:10 I03.4
AI DC Power Supply Solution based on SST: Challenges and Innovations
Wenjie Chen
Sungrow Power Supply Co., Ltd.

Technical Sessions

T01 Grid-Forming & Microgrid – 1

Chair: Min Chen | Zhejiang University
Huimin Wang | Zhejiang Sci-Tech University
Time: 08:30–10:10 August 24, Sunday
Venue: 3F Harvest Room

08:30–08:55 T1.1
Active Power Quality Optimization Control for Grid-Forming Photovoltaic Inverters Based on Harmonic Impedance Reshaping
Junfeng He[1]; Luyao Xie[1]; Kan Jiang; Yi Chen[1]; Suchao Tong[2]; Chuanbao Liu[2]
[1]Zhejiang University of Technology; [2]HRV ELECTRIC.

08:55–09:20 T1.2
Selecting Locations and Capacities for Grid-forming Converters to Enhance Stability and Performance of Grid-forming/Grid-following Hybrid Systems
Feng Tan[1]; Ruohan Leng[1]; Quanmao Li[2]; Hangyu Chen[1]; Zhixian Hou[1]; Liangxiao Luo[1]; Huisheng Gao[1]; Huanhai Xin[1]
[1]Zhejiang University; [2]State Grid Gansu Electric Power Research Institute;

09:20–09:45 T1.3
Transient Stability Analysis of dVOC-Based Grid-Forming Inverters Considering Reactive Power Compensation
Zhida Shang; Cheng Cheng; Yang Liu; Mingyue Wang; Shaokun Niu; Alian Chen
Shandong University

09:45–10:10 T1.4
Novel Integrated Synchronization Schemes for Grid-following and Grid-forming Inverters
Yuying He[1]; Wen Zou[1]; Hao Hu[2]; Huiling Zhang[1]; Li Zhang[1]; Jingxin Hu[2]
[1]Hohai University; [2]Nanjing University of Aeronautics and Astronautics

August 24, Sunday

T02 DC/AC – 1

Chair: Heya Yang | Zhejiang University
Yi Chen | Zhejiang University of Technology
Time: 08:30–10:10 August 24, Sunday
Venue: 4F Diplomat Boardroom

08:30–08:55 T2.1
A Neutral Point Voltage Balance Control for Three-level T-type Inverters with Carrier-based Discontinuous PWM
Haoqing Cai; Min Chen; Dehong Xu
Zhejiang University

08:55–09:20 T2.2
Novel Hybrid Clamped Six-Level Inverter for Medium Voltage Applications: Topology and Operating Principle
Yuying He[1]; Tao Wang[2]; Hao Hu[3]; Jingxin Hu[3]; Xuehua Wang[4]; Wen Zou[1]
[1]Hohai University; [2]The Hong Kong University of Science and Technology (Guangzhou); [3]Nanjing University of Aeronautics and Astronautics; [4]Huazhong University of Science and Technology

09:20–09:45 T2.3
A Type of Seven-Level Inverter with Extension Capability and Reduced Switch Count
Qi Wu; Qingsong Wang
Southeast University

09:45–10:10 T2.4
An Improved Module Power Balance Modulation Method for 9-Level Cascaded Multilevel Inverters
Zhong Chen; Yang Ma; Yunxi Chen; Jiakai Gan; Renyu Li[1]
Nanjing University of Aeronautics and Astronautics

T03 DC/AC – 2

Chair: Hanjing Dong | Hangzhou Dianzi University
Bodong Li | Zhejiang University
Time: 08:30–10:10 August 24, Sunday
Venue: 2F Cinema Five

08:30–08:55 T3.1
High Power Density Current Fed DC/DC Converter and Voltage Spike Suppression
Mingyu Liao[1]; Zhiguo Zhang[2]; Guang Deng[2]; Feng Cheng[2]; Wenjie You[3]; Zhihong Fu[1]
[1]Chongqing University; [2]Chongqing University of Technology; [3]Guizhou Aerospace Linquan Motor Co., Ltd.

08:55–09:20 T3.2
A Fast and Accurate Solution Method for Steady-State Switching Frequency of LCC Resonant Converters Based on Two-Point Method Across Full Load Range
Qingwei Huang[1]; Jun Zhao[2]; Chuanguang Wu[1]; Jiele Rao[1]; Yonghong Xia[1]; Zhiqiang Wang[2]
[1]Nanchang University; [2]Huazhong University of Science and Technology

09:20–09:45 T3.3
Design of a High-Efficiency,High-Frequency DC-DC Converter with Wide-Input-Range for Data Center Applications
Chunyu Ye; Zhijian Fang
China University of Geosciences

09:45–10:10 T3.4
A Multi-Objective Optimization Control Method for Bidirectional Series Resonant Converter
Zhong Chen; Renyu Li; Wei Liu; Jiakai Gan; Kunkun Liu
Nanjing University of Aeronautics and Astronautics

T04 Device & Module

Chair: Na Ren | Zhejiang University
Haidong Yan | Zhejiang University
Time: 08:30–10:10 August 24, Sunday
Venue: 2F Embassy Room

08:30–08:55 T4.1

Junction–Temperature–Orientated Safe Operating Area Test for Power Semiconductors under PWM Operation and Thermal Steady State

Jingxuan Liu[1]; Ke Ma[1]; Guanyu Lu[1]; Yiming Wang[2]; Po Xu[2]; Jiaqi Cao[2]
[1]Shanghai Jiao Tong University; [2]Ginlong Technologies Co., Ltd.

08:55–09:20 T4.2

Driving and Protection Circuit Design of SiC Module for General–Purpose Converter in Distribution Networks

Zhiyuan Ma[1]; Zhong Xu[1]; Shuo Xu[1]; Mingyu Chen[2]; Rui Li[2]
[1]Power Supply Bureau of Guangdong Power Grid Co., Ltd.; [2]Shanghai Jiao Tong University

09:20–09:45 T4.3

Experimental Study on Current Transfer of Hybrid DC Circuit Breaker Based on Reverse Blocking Diode Thyristor

Zhiwen Li; Lin Liang; Zhengheng Qing; Tong Liu; Zhongqi Guo; Kaijun Wen
Huazhong University of Science and Technology

09:45–10:10 T4.4

A Health Monitoring Method for Bonding Wires in IGBT Modules with Auxiliary Terminals During Switching Process

Haidi Zhang; Fei Wang; Xiaokang Zhang
Shanghai University

T05 Grid Forming & Microgrid – 2

Chair: Jing Lyu | Shanghai Jiao Tong Univeisity
Yuming Liao | Zhejiang University
Time: 10:30–12:10 August 24, Sunday
Venue: 3F Harvest Room

10:30–10:55 T5.1

Assessment of Safety Boundary Constraints of Grid–Forming Converters under Asymmetric Grid Faults

Zhi Huang; Zou Xiao; Jingyuan Wen; Boxin Liu; Xin Xiang; Wuhua Li
Zhejiang University

10:55–11:20 T5.2

Coordinated SSCB and Impedance–Based Restoration Scheme for Islanded Microgrids

Symeon Fountoukidis; Ioannis Kanimas; Nick Papanikolaou
Democritus University of Thrace

11:20–11:45 T5.3

Passivity–Based Coordinated Control of Interlinking Converters for Interconnected DC Microgrids

Kai Huang; Sucheng Liu; Chao Wang; Zhiheng Cai; Qianjin Zhang; Xiaodong Liu
Anhui University of Technology

11:45–12:10 T5.4

An Improved Power Margin–Based Coordinated Control Strategy for Hybrid AC/DC Microgrids

Maomao Song; Sucheng Liu; Zhiheng Cai; Chao Wang; Qianjin Zhang; Xiaodong Liu
Anhui University of Technology

August 24, Sunday

T06 DC/AC – 2

Chair: Shuai Shao | Zhejiang University
Jinming Xu | Nanjing University of Aeronautics and Astronautics
Time: 10:30–12:10 August 24, Sunday
Venue: 4F Diplomat Boardroom

10:30–10:55 T6.1
From Boost-VSI to VSI-Boost: a Novel Approach for High Power-Density Cost-Competitive Inverter Systems with Improved Harmonic Signature

Hirotaka Araki; Alberto Castellazzi
Kyoto University of Advanced Science

10:55–11:20 T6.2
Collaborative Control Method of Midpoint Voltage and Zero Sequence Current in Inverter System Based on Modulation Wave Decomposition or Offset

Ruiyang Xie[1]; Min Chen[1]; Xiaotian Wu[2]; Yexiang Yu[2]
[1]Zhejiang University; [2]Dongfang Electric Wind Power Co., Ltd.

11:20–11:45 T6.3
Analytical Model for Zero Voltage Switching of Full-Bridge Inverter under Discontinuous Conduction Mode

Zhuobin Liu; Guipeng Chen; Ziheng Huang; Lantao Huang
Xiamen University

11:45–12:10 T6.4
Hybrid-Mode Modulation Strategy for Series-Resonant Dual Active Bridge Microinverter

Jieming Chen; Liaoyuan Lin; Shaoxiong Zheng; Junfeng Yin
Huaqiao University

T07 DC/DC – 2

Chair: Changsheng Hu | Zhejiang University
Zhong Chen | Nanjing University of Aeronautics and Astronautics
Time: 10:30–12:10 August 24, Sunday
Venue: 2F Cinema Five

10:30–10:55 T7.1
Series-Stacked Modular Bidirectional Converter for Supercapacitor Integration in On-Board Microgrids

Nick Rigogiannis[1]; Nick Papanikolaou[1]; Yongheng Yang[2]
[1]Democritus University of Thrace; [2]Zhejiang University

10:55–11:20 T7.2
A Dual-Frequency Topology for Envelope Tracking Power Supply

Chengguo Qian; Jicheng Huang; Zhihao Jin; Lijun Hang; Yuanbin He
Hangzhou Dianzi University

11:20–11:45 T7.3
Constant On-Time Control for Buck Converter: Analyzing, Simulation and Hardware-In-Loop Verification

Man Liu; Yenan Chen
Zhejiang University

11:45–12:10 T7.4
An Analog Hysteresis Current Control Strategy for Photovoltaic Dual-Switch Flyback Converter

Celiang Deng[1]; Fan Zhang[1]; Jianyu Lan[2]; Jiawei Zang[2]; Min Chen[1]; Feng Jiang[1]
[1]Zhejiang University; [2]Shanghai Institute of Space Power-Sources

August 24, Sunday

T08 Renewable Energy & Energy Storage

Chair: Jiatao Yang | Shanghai Jiao Tong University
Moude Luan | Zhejiang University
Time: 10:30–12:10 August 24, Sunday
Venue: 2F Embassy Room

10:30–10:55 T8.1

Inertia Cooperative Control Strategy for Interlink Converter in AC–DC Hybrid Microgrids Integrated with PV and Energy Storage Systems

Shenkai Mei[1]; Luyao Xie[1]; Rizhen Jiang[2]; Yi Chen[3]; Weihong Fu[2]; Qi Wang[2]
[1]Zhejiang University of Technology; [2]HRV ELECTRIC; [3]Zhijiang College of Zhejiang University of Technology

10:55–11:20 T8.2

Transient Stability Study of Grid–Forming Energy Storage Converters Based on Mixed Potential Function

Meng Sun; Qianjin Zhang; Chengqiang Yin; Lin Zhang; Yifan Zhang; Hongjie An
Provincial Key Laboratory of Power Electronics & Motion Control, Anhui University of Technology

11:20–11:45 T8.3

An Enhanced Matching Control Strategy for Wind Turbine Systems with Machine–side Power Reserve

Yantao Xu[1]; Yongheng Yang[1]; Xiaotian Wu[2]; Xiyan Li [2]
[1]Zhejiang University; [2]Dongfang Electric Wind Power Co., Ltd.

11:45–12:10 T8.4

Dynamic Multi–Path Routing Optimization Mechanism for Energy Efficiency Improvement in Energy Local Area Networks

Zilong Wang; Alian Chen
Shandong University

T09 Grid Forming & Microgrid – 3

Chair: Qianjin Zhang | Anhui University of Technology
Yinxiao Zhu | Zhejiang University
Time: 13:30–15:10 August 24, Sunday
Venue: 3F Harvest Room

13:30–13:55 T9.1

A CAN–Based Carrier Synchronization Method for Parallel Inverter System

Jingru Yang[1]; Min Chen[1]; Haoqing Cai[1]; Yan Zhang[1]; Qing Ding[2]; Changsheng Hu[1]
[1]Zhejiang University; [2]Power Electronics Hanotronies Co., Ltd.

13:55–14:20 T9.2

A Seamless Grid–Connected/off–Grid Mode Transition Control Strategy for A Master–Slave Parallel System

Yan Zhang[1]; Min Chen[1]; Yiran Chen[1]; Jingru Yang[1]; Qing Ding[2]
[1]Zhejiang University; [2]Power Electronics Hanotronies Co., Ltd.

14:20–14:45 T9.3

Adaptability Analysis of Directional Elements under Grid–Forming Control Strategy

Yu Jiang; Wei Dai; Qingsong Wang
Southeast University

14:45–15:10 T9.4

Impedance Circuit Model and Instability Mechanism Analysis of Grid–Forming MMCs with Virtual Admittance Control

Mengyao Zhang[1]; Lei Gao[2]; Jing Lyu[2]; Xiaohu Zhang[1]; Feng Zhu[1]; Ling Xu[1]
[1]East Branch of State Grid Corporation of China; [2]Shanghai Jiao Tong University

August 24, Sunday

T10 EV & Drive – 1

Chair: Wenxi Yao | Zhejiang University
Shuangchun Xie | Zhejiang University Advanced Electrical Equipment Innovation Center
Time: 13:30–15:10 August 24, Sunday
Venue: 4F Diplomat Boardroom

13:30–13:55 T10.1
Electromagnetic Interference Modeling and Analysis of Motor Drive System Based on Analytical Method

Junhao Chang; Feihuang Gong; Henglin Chen
Zhejiang University

13:55–14:20 T10.2
A Novel Deadbeat-Direct Torque and Flux Control for Five-Phase Permanent Magnet Synchronous Motors

Jichen Niu; Xuefeng Jiang; Wangyang Zhou; Tingyuan Zhang
Nanjing University of Science and Technology

14:20–14:45 T10.3
Fault Diagnosis and Fault-Tolerant Control of Current Sensors in Motor Drive Inverter for Electric Vehicle

Ziqian Hu[1]; Liang Cao[2]; Zhihao Song[2]; Wenxi Yao[1]
[1]Zhejiang University; [2]Leadrive Technology (Hangzhou) Co., Ltd.

14:45–15:10 T10.4
Research on Permanent Magnet Synchronous Motor Control Based on Sliding Mode Observer

Long Yang; Xiaolu Ma; Yixian Wang; Sucheng Liu; Qianjin Zhang; Jie Huang
Anhui University of Technology

T11 DC/DC – 3

Chair: Qingsong Wang | Southeast University
Jinxu Yang | ZJU-HIC
Time: 13:30–15:10 August 24, Sunday
Venue: 2F Cinema Five

13:30–13:55 T11.1
Analysis of a Wide-Gain Bidirectional Buck-Boost Converter Based on Dual-Switch Buck-Boost and Switching LC

Zhiqing Wang; Yuxuan Zhang; Hao Chen; Chao Zhang
Jiangsu University

13:55–14:20 T11.2
Two-phase Interleaved High Step-Up DC/DC Converter with Low Input Current Riple Based on Coupled Inductor and Cascaded Switched Capacitor

Cheng Cheng; Longlong Zhang; Haoran Jiang; Shiyu Ji; Kai Wang; Baoxin Li
China University of Petroleum (East China)

14:20–14:45 T11.3
A Simplified Quadrilateral Current Modulation Strategy for Bidirectional Four-Switch Buck-Boost Converters

Yueshi Guan; Xiaohan Yu; Yijie Wang; Dianguo Xu
Harbin Institute of Technology

14:45–15:10 T11.4
Optimization Method for GaN-Based 48-12V Buck Circuit Device and Frequency

Xin Hao; Xinke Wu; Wending Zhao
Zhejiang University

August 24, Sunday

T12 Wireless Power Transfer

Chair: Jiayang Wu | City University of Hong Kong
Wenqi Zhu | Tokyo University of Science
Time: 13:30–15:10 August 24, Sunday
Venue: 2F Embassy Room

13:30–13:55 **T12.1**

Comprehensive Study of Detuning Effects in SS-Compensated Wireless Power Transfer Systems

Gangwei Zhu; Jiayang Wu; Siew Chong Tan; Shu Yuen Ron Hui
City University of Hong Kong

13:55–14:20 **T12.2**

Semi-Active Rectifier Based Maximum Efficiency Point Tracking Method for Wireless Power Transfer

Shipeng Qin; Xiaoqiang Wang; Jianping Xu
Southwest Jiaotong University

14:20–14:45 **T12.3**

Simultaneous Wireless Power and Information Transfer Based on Semi-Bridgeless Active Rectifier

Yiwen Liu; Wanying Weng; Keming Liu; Guoao Li; Jiande Wu; Xiangning He
Zhejiang University

14:45–15:10 **T12.4**

A Stepped Coil Design for An Implantable Deep Brain Stimulation

An Zhou[1]; Wenxing Zhong[2]; Tianhao Huang[1]
[1]Zhejiang University; [2]Ningbo University

T13 AC/DC

Chair: Chi-Seng Lam | University of Macau
Gangwei Zhu | City University of Hong Kong
Time: 15:30–17:10 August 24, Sunday
Venue: 3F Grand Ballroom B

15:30–15:55 **T13.1**

Single-Phase Quasi-Single-Stage Isolated AC-DC Power Converter with Wide Voltage Gain Capability

Wenyu Xiong[1]; Yuanbin He[1]; Lijun Hang[1]; Yaoyou Su[2]; Xiaoyong Li[2]; Jianming Chen[2]
[1]Hangzhou Dianzi University; [2]SolaX Power Network Technology

15:55–16:20 **T13.2**

A Novel Isolated Totem-Pole Single-Stage AC-DC Converter and Its Modulation Strategy

Lixun Zhou; Hanchao Zeng; Long Chen; Yanhui Qiu; Damin Zhang
Xiamen University of Technology

16:20–16:45 **T13.3**

Low-Voltage Stress Single-Phase AC-DC Active Power Decoupling Converter Based on Improved Boost Circuit

Wenchao Zhu; Ziyang Huang; Tiansheng Wang; Chao Zhang
Jiangsu University

16:45–17:10 **T13.4**

Harmonic Injection Modulation Method of Single-Phase Single-Stage DAB-Based Bidirectional AC-DC Converter

Zhiheng Cai; Sucheng Liu; Maomao Song; Kai Huang; Qianjing Zhang; Xiaodong Liu
Anhui University of Technology

August 24, Sunday

T14 EV & Drive –2

Chair: Wenxi Yao | Zhejiang University
Xiang Meng | Zhejiang University
Time: 15:30–17:10 August 24, Sunday
Venue: 3F Harvest Room

15:30–15:55 T14.1
Modeling and Compensation of Eccentricity Errors in Variable Reluctance Resolvers

Zhiyang Cao[1]; Ziqian Hu[1]; Liang Cao[2]; Wenxi Yao[1]
[1]Zhejiang University; [2]Leadrive Technology (Hangzhou) Co., Ltd.

15:55–16:20 T14.2
Discretization Methods for Full–Order Observers in Sensorless Control of IPMSM

Lingquan Bao[1]; Qianru Lin[1]; Zhihao Song[2]; Liang Cao[2]; Wenxi Yao[1]
[1]Zhejiang University; [2]Leadrive Technology (Hangzhou) Co., Ltd.

16:20–16:45 T14.3
Electromagnetic Interference Filter Design Based on Terminal Model of Motor Drive System

Zhaocheng Zhong; Junhao Chang; Yuxiang Liu; Henglin Chen
Zhejiang University

16:45–17:10 T14.4
Four–Vector SMC for Dual Three–Phase PMLSMs

Xi Rao; Jinsong Kang; Zongbo Hu; Liangrong Sun
Tongji University

T15 Passive Component

Chair: Sihui Hong | Zhejiang University
Yu Dou | Zhejiang University
Time: 15:30–17:10 August 24, Sunday
Venue: 4F Diplomat Boardroom

15:30–15:55 T15.1
A Hybrid Staggered–Array Circular Pin Fin Microchannel Liquid–cooled Heat Sink for Localized Hotspot Cooling

Xinglan Hou; Yongheng Yang
Zhejiang University

15:55–16:20 T15.2
A Novel Thermal Time Constant–Based Health Monitoring Method for Power Inductors

Zhihuan Wang; Jun Zhang; Huixian Shen; Haiyan Sun
Hohai University

16:20–16:45 T15.3
Leakage–Inductance–Optimized Winding Configuration for Center–Tapped Planar Transformers in Full–Wave Rectifier LLC Converters

Tiantian Dong; Chunguang Ren; Ziqian Ren; Xinqi Li
Taiyuan University of Technology

16:45–17:10 T15.4
An Integrated Matrix Transformer Suitable for LLC Resonant Converter

Jisinan Wang; Changsheng Hu
Zhejiang University

August 24, Sunday

T16 AI for Power Electronics

Chair: Yongheng Yang | Zhejiang University
Lunbo Deng | Zhejiang University
Time: 15:30–17:10 August 24, Sunday
Venue: 2F Cinema Five

15:30–15:55 T16.1

Neural Network Based Steady-State Characteristic Analysis of LLC Converter

Wen Cao; Sixin Lin; Guipeng Chen
Xiamen University

15:55–16:20 T16.2

A Swarm Intelligence Algorithm Applicable to State Identification of Transformerless Direct Hanging Battery Energy Storage Systems

Cheng Peng[1]; Daming Wang[2]; Rui Li[1]
[1]Shanghai Jiao Tong University; [2]Electric Power Research Institute of China Southern Power Grid

16:20–16:45 T16.3

Deep Reinforcing Learning for Effective Reference Tracking in Power Electronics Applications

Anugula Rajamallaiah[1]; Nishant Thakkar[1]; Hamidreza Arasteh[2]; Josep M. Guerrero[1]
[1]Zhejiang University; [2]Niroo Research Institute

16:45–17:10 T16.4

Short-Term Load Forecasting with Integrated Dynamic Holiday Awareness and Multi-Scale Temporal Modeling

Jing Yuan; Wanghan Yang; Ruixiang Cheng; Changshuo Li; Yehui Han
Zhejiang University

August 24, Sunday

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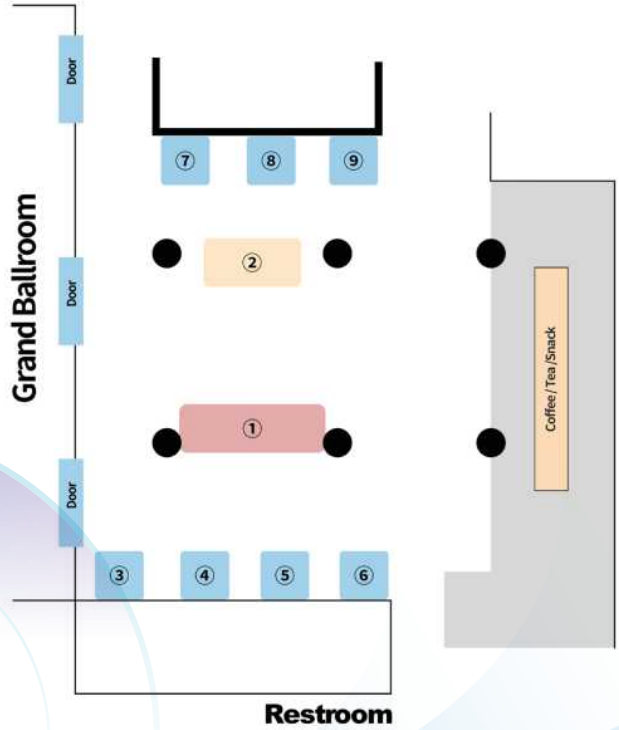

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3.电平电源转换电路用IGBT模块:与2电平模块相比,输出波形近似正弦波,因此可实现LC滤波器小型化。另外,开关损耗降低一半,因此效率得以提高。针对太阳能发电、不间断电源装置等用途。
4.IPM:内置有包含IGBT驱动电路和保护电路的控制IC,因而容易设计外围电路,从而能够确保系统的高可靠性。适用于AC伺服系统,空调机、升降机等。
5.PIM:将3相变频器电路,二极管桥接电路,制动电路集成到1个模块上的产品,能够紧凑地设计主电路。分为小型轻量的小容量PIM和EconoPIMTM的两大类。
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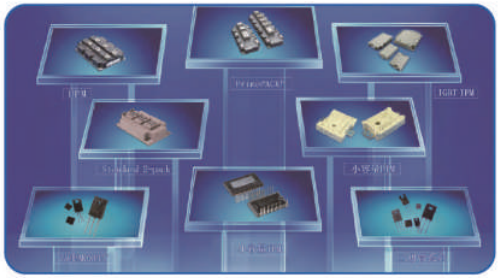

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2. EV and HEV used IGBT:
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   Integrate 3-phase inverter, rectifier and brake circuit into one module, making main circuit simpler and compacter, including Small PIM and Econo PIM two kinds of package.
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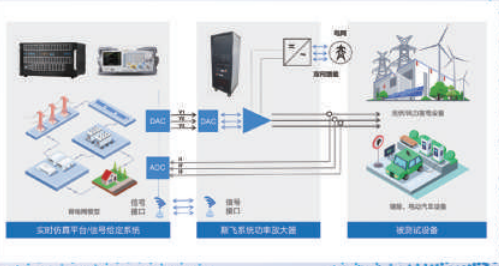

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