

The 10th International Power Electronics and Motion Control Conference

第十屆國際電力電子與運動控制會議

May 17-20, 2024 CHENGDU·CHINA



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China Electrotechnical Society
扫描关注学会公众号

Conference Manual

会议手册

- Organized by  中国电工技术学会
China Electrotechnical Society
- Co-Sponsored by  IEEC POWER
ELECTRONICS SOCIETY
Powering a Sustainable Future
- ECCE Asia Cooperation  
- Hosted by  西南交通大学
Southwest Jiaotong University





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» Program at a Glance

May 17, Friday

09:30-21:30	Registration		The lobby of Oaks Chengdu at Cultural Heritage Park 成都非遗博览园盛橡服务式公寓大堂(2F)													
13:30-15:30	Tutorial 1	Meeting Room 10 文翁厅	Tutorial 2	Meeting Room 11 石室厅	Tutorial 3	Meeting Room 1 琴台厅	Tutorial 4	Meeting Room 2 故里厅	Tutorial 5	Meeting Room 3 鼓楼厅	Tutorial 6	Meeting Room 5 南街厅	Tutorial 7	Meeting Room 7 窄巷厅	Tutorial 8	Meeting Room 6 宽巷厅
16:00-18:00	Tutorial 9	Meeting Room 10 文翁厅	Tutorial 10	Meeting Room 11 石室厅	Tutorial 11	Meeting Room 1 琴台厅	Tutorial 12	Meeting Room 2 故里厅	Tutorial 13	Meeting Room 3 鼓楼厅	Tutorial 14	Meeting Room 5 南街厅	Tutorial 15	Meeting Room 7 窄巷厅	Tutorial 16	Meeting Room 6 宽巷厅
17:00-20:00	Welcome Reception		Serendipity Outdoor Lawn 嘉缘岛户外草坪													

May 18, Saturday

07:30-21:00	Registration		The lobby of Oaks Chengdu at Cultural Heritage Park 成都非遗博览园盛橡服务式公寓大堂(2F)													
09:00-09:30	Opening Ceremony		Grand Ballroom 蜀风宴会厅													
09:30-12:00	Keynote Speeches I		Grand Ballroom 蜀风宴会厅													
12:00-13:30	Lunch		Ballroom 3, 1933cafe, and TiHong Chinese Restaurant 蜀风宴会厅3/1933咖啡厅/缙蓉中餐厅													
13:30-15:10	Keynote Speeches II		Grand Ballroom 蜀风宴会厅													
15:30-17:10	Keynote Speeches III		Grand Ballroom 蜀风宴会厅													
17:10-18:10	Poster Presentation A		Poster Presentation Area (Ballroom Foyer 宴会序厅)					APECC Meeting & APEJ Meeting			VIP Lounge 青羊厅					
18:00-19:30	Dinner		Ballroom 3, 1933cafe, and TiHong Chinese Restaurant 蜀风宴会厅3/1933咖啡厅/缙蓉中餐厅													
19:00-21:00	Young Professionals Networking Reception		Breeze Terrace & Sky Bar 微风露台&酒吧 (17F)													

May 19, Sunday

08:00-08:20	Breakfast Meeting for Session Chairs			TiHong Chinese Restaurant (Breakfast Dining Area for the Session Chairs)									
08:30-10:00	Oral 1	Oral 2	Oral 3	Oral 4	Oral 5	Oral 6	Oral 7	Oral 8	Oral 9	Industry Forum Title: Power Semiconductor Devices Time: 08:30-12:10 Location: Meeting Room 11 石室厅	IEEE PELS Administrative Committee Meeting Time: 09:00-12:00 Location: Meeting Room 9 金沙厅		
	Meeting Room 1 琴台厅	Meeting Room 2 故里厅	Meeting Room 3 鼓楼厅	Meeting Room 5 南街厅	Meeting Room 6 宽巷厅	Meeting Room 7 窄巷厅	Meeting Room 10 文翁厅	Board Room 董事会议室	VIP Lounge 青羊厅				
10:30-12:00	Oral 10	Oral 11	Oral 12	Oral 13	Oral 14	Oral 15	Oral 16	Oral 17	Oral 18	ECCE-Asia WiE Event Time: 14:00-17:00 Location: Meeting Room 10+11 文翁石室厅	Special Session on IEEE Standards and Roadmaps Time: 13:30-17:00 Location: Meeting Room 1 琴台厅		
	Meeting Room 1 琴台厅	Meeting Room 2 故里厅	Meeting Room 3 鼓楼厅	Meeting Room 5 南街厅	Meeting Room 6 宽巷厅	Meeting Room 7 窄巷厅	Meeting Room 10 文翁厅	Board Room 董事会议室	VIP Lounge 青羊厅				
12:00-13:30	Lunch		Grand Ballroom 蜀风宴会厅										
13:30-15:00	Oral 19	Oral 20	Oral 21	Oral 22	Oral 23	Oral 24	Oral 25	Oral 26	ECCE-Asia WiE Event Time: 14:00-17:00 Location: Meeting Room 10+11 文翁石室厅			Special Session on IEEE Standards and Roadmaps Time: 13:30-17:00 Location: Meeting Room 1 琴台厅	
	Meeting Room 6 宽巷厅	Meeting Room 2 故里厅	Meeting Room 3 鼓楼厅	Meeting Room 5 南街厅	Meeting Room 8 浣花厅	Meeting Room 7 窄巷厅	Board Room 董事会议室	VIP Lounge 青羊厅					
15:30-17:00	Oral 27	Oral 28	Oral 29	Oral 30	Oral 31	Oral 32	Oral 33	Oral 34	ECCE-Asia WiE Event Time: 14:00-17:00 Location: Meeting Room 10+11 文翁石室厅			Special Session on IEEE Standards and Roadmaps Time: 13:30-17:00 Location: Meeting Room 1 琴台厅	
	Meeting Room 6 宽巷厅	Meeting Room 2 故里厅	Meeting Room 3 鼓楼厅	Meeting Room 5 南街厅	Meeting Room 8 浣花厅	Meeting Room 7 窄巷厅	Board Room 董事会议室	VIP Lounge 青羊厅					
17:00-18:00	Poster Presentation B		Poster Presentation Area (Ballroom Foyer 宴会序厅)										
17:00-18:20	ECCE Asia Coordination Committee Meeting			Meeting Room 9 金沙厅									
18:30-20:30	Banquet		Grand Ballroom 蜀风宴会厅										

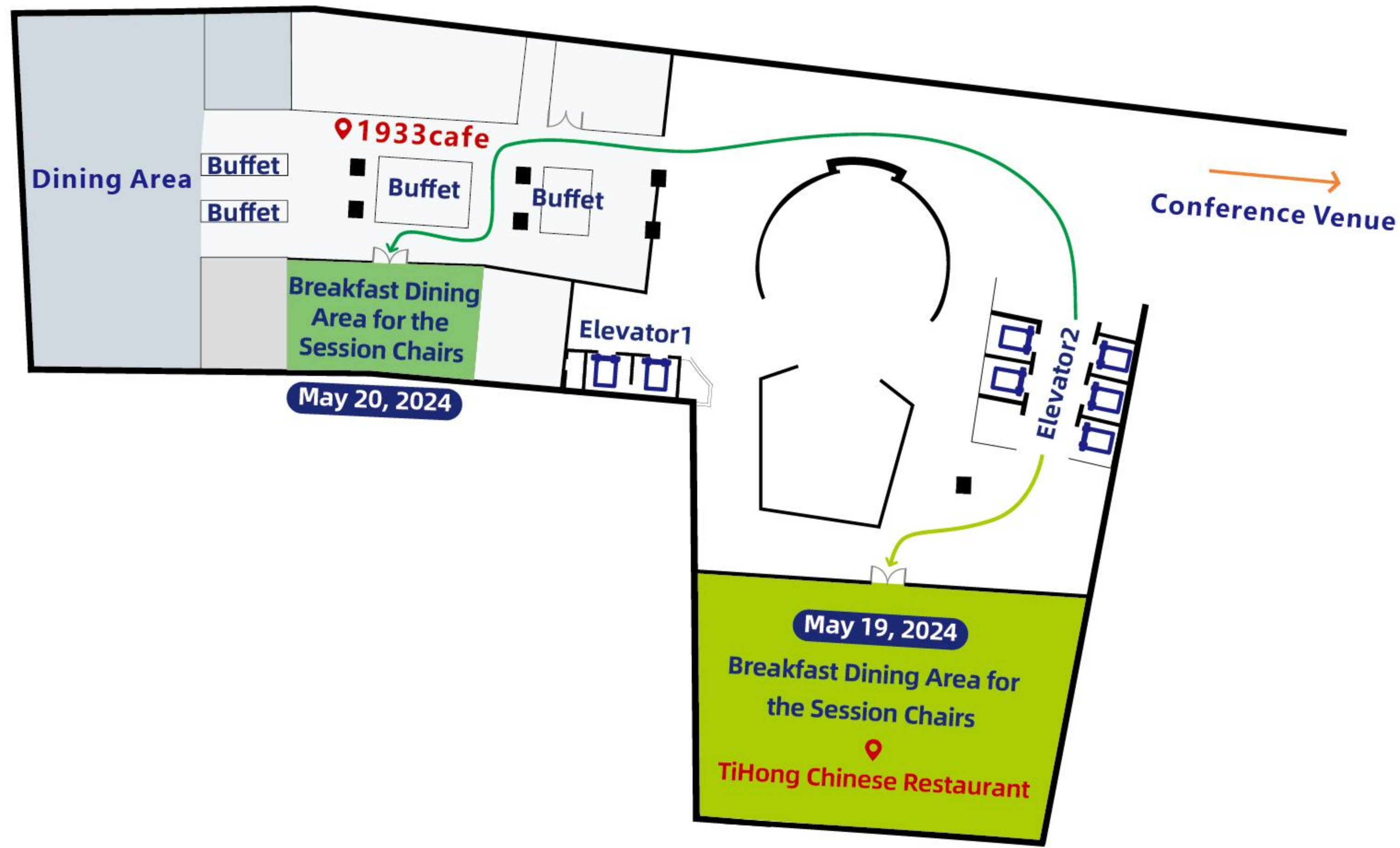
May 20, Monday

08:00-08:20	Breakfast Meeting for Session Chairs			1933cafe (Breakfast Dining Area for the Session Chairs)								
08:30-10:00	Oral 35	Oral 36	Oral 37	Oral 38	Oral 39	Oral 40	Oral 41	Oral 42	Oral 43	Oral 44	Oral 45	
	Meeting Room 1 琴台厅	Meeting Room 2 故里厅	Meeting Room 3 鼓楼厅	Meeting Room 5 南街厅	Meeting Room 6 宽巷厅	Meeting Room 7 窄巷厅	Meeting Room 9 金沙厅	Meeting Room 10 文翁厅	Meeting Room 11 石室厅	Board Room 董事会议室	VIP Lounge 青羊厅	
10:30-12:00	Oral 46	Oral 47	Oral 48	Oral 49	Oral 50	Oral 51	Oral 52	Oral 53	Oral 54	Oral 55	Oral 56	
	Meeting Room 1 琴台厅	Meeting Room 2 故里厅	Meeting Room 3 鼓楼厅	Meeting Room 5 南街厅	Meeting Room 6 宽巷厅	Meeting Room 7 窄巷厅	Meeting Room 9 金沙厅	Meeting Room 10 文翁厅	Meeting Room 11 石室厅	Board Room 董事会议室	VIP Lounge 青羊厅	
12:00-13:30	Lunch		1933cafe 1933咖啡厅									
13:30-17:00	Technical Tours		Hope Senlan Science and Technology Holding Corp., Ltd. 希望森兰科技股份有限公司									

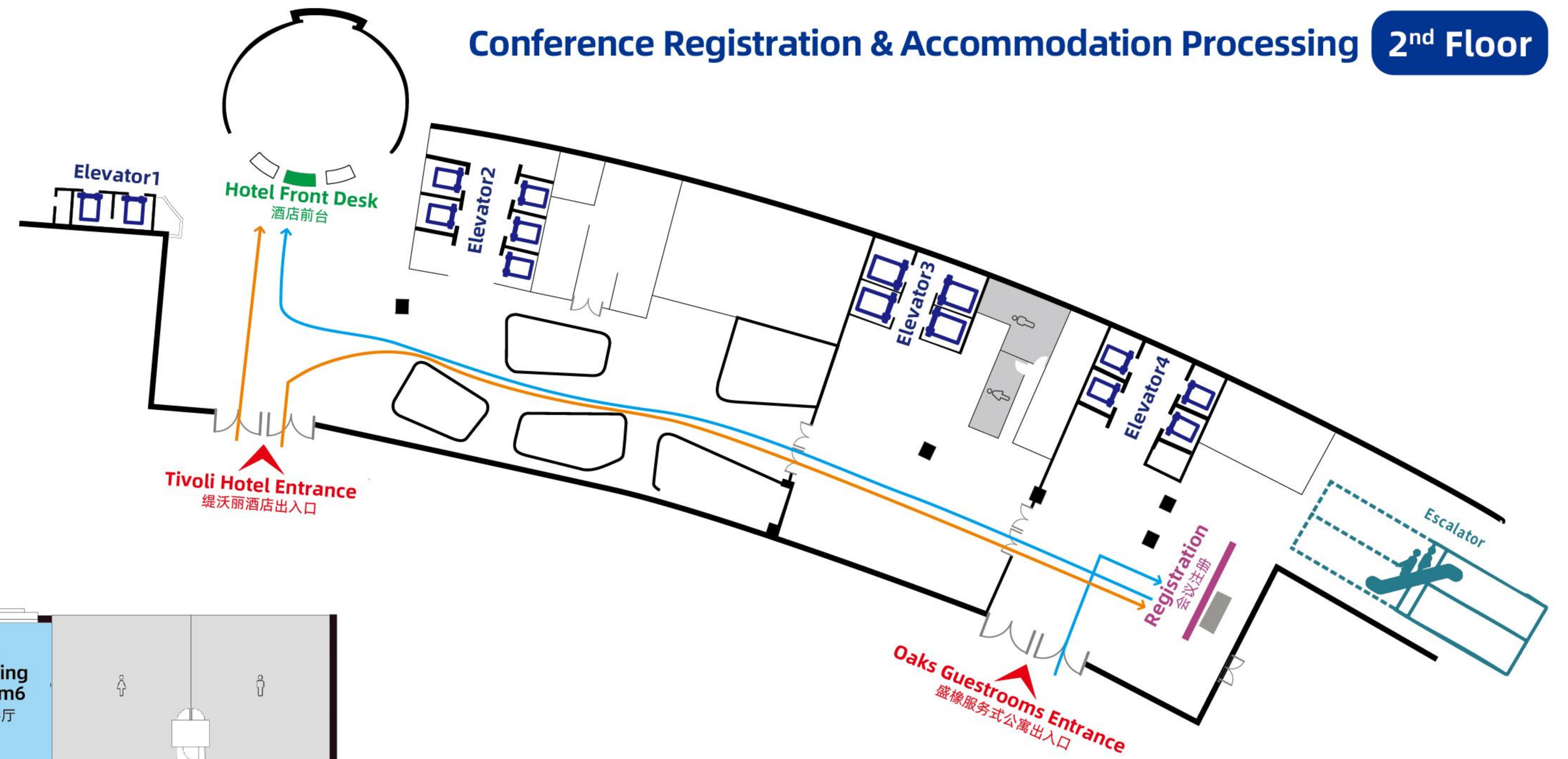
Parallel Meetings (Internal)
 Parallel Meetings (External)
 Location

» Venue Layout

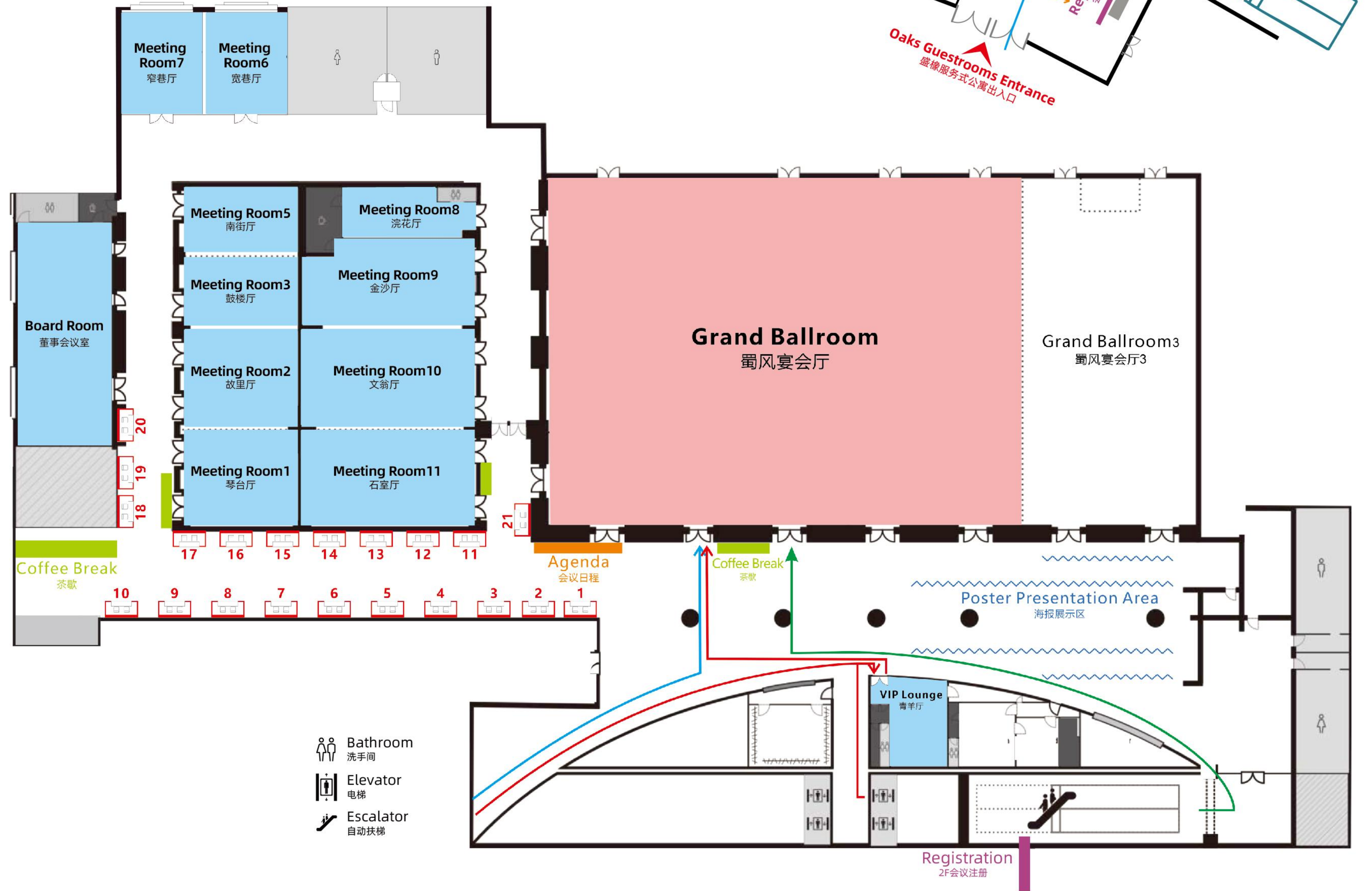
3rd Floor Breakfast Dining Area for the Session Chairs



Conference Registration & Accommodation Processing 2nd Floor



3rd Floor Conference Venue



Booth Number	Name	Website
1	英飞凌科技(中国)有限公司	www.infineon.com
2	艾德克斯电子(南京)有限公司	www.itechate.com
3	上海远宽能源科技有限公司	www.modeling-tech.com
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6	成都安诚迅飞电子科技有限公司	www.ancntest.com
7	安徽芒课教育科技有限公司	http://mokitedu.com
8	山东东泰方思电子有限公司	www.dtt-ferrite.com
9	东方日立(成都)电控设备有限公司	www.dhc-cd.com
10	深圳麦科信科技有限公司	www.micsig.com.cn
11	南京瑞途优特电子科技有限公司	www.rtunit.com
12	迈斯沃克软件(北京)有限公司	ww2.mathworks.cn
13	华特力科(北京)商贸有限公司	www.teledynelecroy.com.cn
14	迈为电子技术(上海)有限公司	www.myway-sh.com
15	成都咏绎电子科技有限公司	www.yoi-tech.com
16	中茂电子(深圳)有限公司	www.chroma.com.cn
17	郑州维安高科有限公司	http://viantech.cn
18	成都兴亚光电子实业有限公司	www.xingyaguang.com
/	深圳市贝思科尔软件技术有限公司	www.basicae.com
20	上海汉象智能科技有限公司	http://hanxiang-tech.com/

Name	Color	Booth Number
Coffee Break 茶歇	Green	
Registration 2F会议注册	Purple	
Agenda 会议日程	Orange	
Poster Presentation Area 海报展示区	Blue	
Booths 展位	Red	1-21
Guest Circulation Routes 嘉宾动线	Red Arrow	
Circulation Route 1 动线1	Green Arrow	
Circulation Route 2 动线2	Blue Arrow	

- Bathroom 洗手间
- Elevator 电梯
- Escalator 自动扶梯

» Welcome Letter from General Chair



Dear Colleagues,

On behalf of the Organizing Committee of the 10th International Power Electronics and Motion Control Conference-ECCE Asia (IPEMC 2024-ECCE Asia), we wish to extend our warm welcome to all of you to Chengdu, Sichuan Province, China. We

are grateful for your participation and valuable contribution to IPEMC 2024-ECCE Asia.

IPEMC 2024-ECCE Asia is one of the most important conferences that brings our members together from all over the world to share professional experiences, expand our professional networks, and stay up-to-date with the latest advances in science and technology in the field of power electronics.

The conference will provide a variety of programs, including distinguished presentations, networking events, and tours, to facilitate fruitful and enriching discussions as well as to initiate interdisciplinary collaborations for the advancement of your research. We believe that this conference will benefit us by broadening horizons, stimulating ideas and enhancing contacts with international colleagues.

Chengdu, the capital of Sichuan province, is widely known as the "Land of Abundance" and "Capital of Recreation". It is the only famed historical and cultural city in China with both of its name and location unchanged for over two thousand years. Chengdu is famous for being home to giant pandas, and its delectable spicy Sichuan cuisine. It is also the technological center, commercial center, financial center, and transportation nexus in Southwest China. We have prepared social activities to support participants to connect to each other and enjoy the beauty of Chengdu.

We, together with all other members of the Organizing Committee, wish you an enjoyable and enlightening experience at IPEMC 2024-ECCE Asia in Chengdu.

Sincerely,

Prof. Frede Blaabjerg, Aalborg University, Denmark
Prof. Xiaoqiong He, Southwest Jiaotong University, China
General Chairs of IPEMC 2024-ECCE Asia

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Agenda

May 17, Friday

13:30-15:30	Tutorial 1: Modeling and Control of Grid-Tied Converters for Distributed Energy Resources Lecturers: Jingyang Fang, Hao Tian, Tao Xu, Feng Gao	Meeting Room 10 文翁厅
	Tutorial 2: Model Predictive Control: Basic concepts, Applications, Advances and Trends Lecturers: Jose Rodriguez, Zhenbin Zhang, Fengxiang Wang, Lin Qiu, Chenwei Ma	Meeting Room 11 石室厅
	Tutorial 3: Design, Analysis, and Control of Advanced Electric Machines Lecturer: Chunhua Liu	Meeting Room 1 琴台厅
	Tutorial 4: High-Power Converters for Power-to-X Applications Lecturers: Stig Munk-Nielsen, Mingzhi He, Morten Rahr Nielsen	Meeting Room 2 故里厅
	Tutorial 5: Stability and Control of Grid-Forming Converters Lecturers: Xiongfei Wang, Heng Wu	Meeting Room 3 鼓楼厅
	Tutorial 6: SiC MOSFET Gate Drivers for High-Power Applications Lecturers: Drazen Dujic, Chengmin Li	Meeting Room 5 南街厅
	Tutorial 7: Modelling and Control of Wireless Power Transfer: State of the Art Lecturers: Minfan Fu, Yun Yang, Yong Li	Meeting Room 7 窄巷厅
	Tutorial 8: Design and Control of Solid-State DC Transformers for DC Transmission and Distribution Grids Lecturers: Rik W. De Doncker, Jingxin Hu, Shenghui Cui, Subhashish Bhattacharya	Meeting Room 6 宽巷厅
16:00-18:00	Tutorial 9: Fault Diagnosis and Tolerant Control of AC Motor Drives Lecturers: Zheng Wang, Jiangbiao He, Xueqing Wang	Meeting Room 10 文翁厅
	Tutorial 10: Power Electronics as the Enabling Technology for Buildings Decarbonization Lecturers: Dmitri Vinnikov, Andrii Chub, Andrei Blinov	Meeting Room 11 石室厅
	Tutorial 11: Artificial Intelligence-assisted Applications in Power Electronics Lecturers: Shuai Zhao, Yi Zhang, Huai Wang	Meeting Room 1 琴台厅
	Tutorial 12: Multi-Cell & Multi-Level Power Converters - From Theory to Practice Lecturers: Petar. J. Grbović, Thierry. A. Meynard, Zoran Miletic	Meeting Room 2 故里厅
	Tutorial 13: Computer-aided Accurate Modeling and Design Optimization for Isolated Resonant DC-DC Converters Lecturers: Yuqi Wei, Quanming Luo, Jinjun Liu	Meeting Room 3 鼓楼厅
	Tutorial 14: Power Quality and Operability of Distributed Power Generation Systems: Advanced and Intelligent Control Lecturers: Yongheng Yang, Chi-Seng Lam, Nick Papanikolaou	Meeting Room 5 南街厅
	Tutorial 15: Graph Theory-based Methods for Power Converters and Systems Lecturers: Yunwei (Ryan) Li, Yuzhuo Li	Meeting Room 7 窄巷厅
	Tutorial 16: Reliability Challenges and Potential Solutions in Wide-bandgap Device based Motor Drives Lecturers: Xibo Yuan, Wenzhi Zhou, Mohamed Diab	Meeting Room 6 宽巷厅
17:00-20:00	Welcome Reception	Serendipity Outdoor Lawn 嘉缘岛户外草坪

May 18, Saturday

Grand Ballroom 蜀风宴会厅	
Opening Ceremony Chairs: Xiaoqiong He , Southwest Jiaotong University, China Frede Blaabjerg , Aalborg University, Denmark	
09:00-09:30	Dianguo Xu Vice President of China Electrotechnical Society, China
	Brad Lehman President of IEEE Power Electronics Society, USA
	Hitoshi Hayashiya President of IEEJ Industry Applications Society, Japan
	Se Kyo Chung President of Korean Institute of Power Electronics, Korea
	Minming Yu Secretary of the Party Committee of Southwest Jiaotong University, China
Keynote Speeches I Chairs: Liuchen Chang , University of New Brunswick, Canada Mark Dehong Xu , Zhejiang University, China	
09:30-10:00	State-of-the-Art Power Semiconductor Device Technology Rongjun Ding , CRRC Zhuzhou Institute, Co., LTD., China
10:05-10:35	Future Systems for Transmission and Distribution of Electrical Energy Dushan Boroyevich , Virginia Tech - CPES, USA
10:35-10:55	Break
10:55-11:25	DFX: Design and Manufacturing of Power Electronics Chips and Packaging Based on Digital Twin Technology Sheng Liu , Wuhan University, China
11:30-12:00	Model Predictive Control: Basic concepts, Applications, Advances and Challenges Jose Rodriguez , Universidad San Sebastian, Chile
12:00-13:30	Lunch Ballroom 3, 1933cafe, and TiHong Chinese Restaurant 蜀风宴会厅3/1933咖啡厅/缙蓉中餐厅

Keynote Speeches II			
Chairs: Dianguo Xu , Harbin Institute of Technology, China Jinjun Liu , Xi'an Jiaotong University, China			
13:30-14:00	Injecting Digital into Power Electronics via Gate Driver ICs Makoto Takamiya , The University of Tokyo, Japan		
14:05-14:35	Progress, Status, and Challenges in Electric Motor Drive Technology Jung-ik Ha , Seoul National University, Korea		
14:40-15:10	Rail Transit "Grid-Source-Storage-Vehicle" Collaborative Power Supply Shibin Gao , Southwest Jiaotong University, China		
15:10-15:30	Break		
Keynote Speeches III			
Chairs: Xinbo Ruan , Nanjing University of Aeronautics and Astronautics, China Yunwei Ryan Li , University of Alberta, Canada			
15:30-16:00	Advances and Challenges in the Modeling and Suppression of Electromagnetic Interference for Power Electronics Systems Shuo Wang , University of Florida, USA		
16:05-16:35	eVTOL Aircraft - The Future of Urban Air Mobility Johann Walter Kolar , ETH Zurich, Switzerland		
16:40-17:10	Energy Access and Energy Transition: Challenges and Opportunities Issa Batarseh , University of Central Florida, USA		
17:10-18:10	Poster Presentation A Poster Presentation Area (Ballroom Foyer 宴会序厅)		
18:00-19:30	Dinner Ballroom 3, 1933cafe, and TiHong Chinese Restaurant 蜀风宴会厅3/1933咖啡厅/缙蓉中餐厅		
19:00-21:00	Young Professionals Networking Reception	Breeze Terrace & Sky Bar (17 F) 微风露台&酒吧	Chairs Pinjia Zhang Wensheng Song

May 19, Sunday Oral 1 - Oral 9 & Industry Forum			
Time	Oral Session & Industry Forum Title	Location	Chairs
08:00-08:20	Breakfast Meeting for Session Chairs	TiHong Chinese Restaurant (Breakfast Dining Area for the Session Chairs)	Ping Yang Shunfeng Yang
08:30-10:00	Oral 1: Devices, Packaging and System Integration	Meeting Room 1 琴台厅	Jun Wang Han Cui
	Oral 2: Power Converters and Control (I)	Meeting Room 2 故里厅	Min Chen Quanming Luo
	Oral 3: Motor Drives and Motion Control (I)	Meeting Room 3 鼓楼厅	Chunhua Liu Xiaoqiang Li
	Oral 4: Power Quality	Meeting Room 5 南街厅	Hongliang Wang Meng Huang
	Oral 5: Electrified Transportation	Meeting Room 6 宽巷厅	Hong Li Yongchang Zhang
	Oral 6: Renewable Energy and Smart Grid (I)	Meeting Room 7 窄巷厅	Chuang Liu Hailiang Xu
	Oral 7: Wireless Power Transfer	Meeting Room 10 文翁厅	Qianming Xu Wenxing Zhong
	Oral 8: Energy Storage and Management (I)	Board Room 董事会议室	Jinwei He Junming Zhang
	Oral 9: Reliability, Diagnosis, and Protection (I)	VIP Lounge 青羊厅	Weimin Wu Huimin Wang
	Industry Forum: Power Semiconductor Devices	Meeting Room 11 石室厅	Guoyou Liu Xu Yang
10:00-10:30	Break		



May 19, Sunday Oral 10 - Oral 18 & Industry Forum			
Time	Oral Session & Industry Forum Title	Location	Chairs
10:30-12:00	Oral 10: WBG Device Packaging, Modeling and Reliability	Meeting Room 1 琴台厅	Laili Wang Wei Lai
	Oral 11: Power Converters and Control (II)	Meeting Room 2 故里厅	Lei Lin Bi Liu
	Oral 12: Motor Drives and Motion Control (II)	Meeting Room 3 鼓楼厅	Ronggang Ni Chaoqun Xiang
	Oral 13: Renewable Energy and Smart Grid (II)	Meeting Room 5 南街厅	Yongheng Yang Wenli Yao
	Oral 14: Energy Storage and Management (II)	Meeting Room 6 宽巷厅	Li Zhang Yigeng Huangpu
	Oral 15: Reliability, Diagnosis, and Protection (II)	Meeting Room 7 窄巷厅	Ke Ma Andrii Chub
	Oral 16: DC Power Systems	Meeting Room 10 文翁厅	Weilin Li Zeng Liu
	Oral 17: Artificial Intelligence Applications in Power Electronics	Board Room 董事会议室	Cungang Hu Yanbo Wang
	Oral 18: Emerging Power Electronics and Other Applications	VIP Lounge 青羊厅	Xin Xiang Hui Zhang
		Industry Forum: Power Semiconductor Devices	Meeting Room 11 石室厅
12:00-13:30	Lunch Grand Ballroom 蜀风宴会厅		

May 19, Sunday Oral 19 - Oral 26				
Time	Oral Session Title	Location	Chairs	
13:30-15:00	Oral 19: Power Converters and Control (III)	Meeting Room 6 宽巷厅	Xiaoqiang Guo Dehong Zhou	
	Oral 20: Motor Drives and Motion Control (III)	Meeting Room 2 故里厅	Dong Jiang Yanping Zhang	
	Oral 21: Applications of Power Electronics Enabled by Wide-Bandgap Devices (I)	Meeting Room 3 鼓楼厅	Haoze Luo Hongbo Zhao	
	Oral 22: Smart Control and Operation of Modern Energy Storage Systems	Meeting Room 5 南街厅	Pengfeng Lin Caizhi Zhang	
	Oral 23: Applications of Grid-Forming Inverter-Based Resources in Modern Power Systems	Meeting Room 8 浣花厅	Heng Wu Teng Liu	
	Oral 24: Innovation in Motor Drive Systems for Electric Vehicles (I)	Meeting Room 7 窄巷厅	Lefei Ge Dianxu Xiao	
	Oral 25: Emerging Advances in Grid-Connected Renewable Systems	Board Room 董事会议室	Shan He Zhiqing Yang	
	Oral 26: Advanced Modeling, Analysis, and Control of Power-electronic-based Modern Power Systems (I)	VIP Lounge 青羊厅	Weihua Zhou Zhengge Chen	
	15:00-15:30	Break		



May 19, Sunday Oral 27 - Oral 34			
Time	Oral Session Title	Location	Chairs
15:30-17:00	Oral 27: Power Converters and Control (IV)	Meeting Room 6 宽巷厅	Binbin Li Guo Xu
	Oral 28: Applications of Power Electronics Enabled by Wide-Bandgap Devices (II)	Meeting Room 2 故里厅	Yingzhou Peng Zhan Shen
	Oral 29: Innovation in Motor Drive Systems for Electric Vehicles (II)	Meeting Room 3 鼓楼厅	Chao Gong Zhen Huang
	Oral 30: Advanced Modeling, Analysis, and Control of Power-electronic-based Modern Power Systems (II)	Meeting Room 5 南街厅	Liansong Xiong Chuanchuan Hou
	Oral 31: Reliability Oriented Electrical Machine Systems: Topology, Monitoring, and Control	Meeting Room 8 浣花厅	Hui Zhang Dong Xie
	Oral 32: Advanced Modulation, Control and Topology of DC-DC Converters (I)	Meeting Room 7 窄巷厅	Nie Hou Jia Yao
	Oral 33: Solid-State DC Transformers for DC Transmission and Distribution Grids (I)	Board Room 董事会议室	Jingxin Hu Shenghui Cui
	Oral 34: Modern Control of Multi-Level/Multi-Phase Motor Drives	VIP Lounge 青羊厅	Shuai Xu Xueqing Wang
	13:30-17:00	Special Session on IEEE Standards and Roadmaps	Meeting Room 1 琴台厅
14:00-17:00	ECCE-Asia WiE Event	Meeting Room 10+11 文翁石室厅	Hong Li Han Cui Ping Yang
17:00-18:00	Poster Presentation B Poster Presentation Area (Ballroom Foyer 宴会序厅)		
18:30-20:30	Banquet Grand Ballroom 蜀风宴会厅		

May 20, Monday Oral 35 - Oral 45				
Time	Oral Session Title	Location	Chairs	
08:00-08:20	Breakfast Meeting for Session Chairs	1933cafe(Breakfast Dining Area for the Session Chairs)	Ping Yang Huimin Wang	
08:30-10:00	Oral 35: Power Converters and Control (V)	Meeting Room 1 琴台厅	Zhenyu Shan Guanguan Zhang	
	Oral 36: Reliability Improvement Techniques for Power Electronics System (I)	Meeting Room 2 故里厅	Chengmin Li Baohong Li	
	Oral 37: Solid-State DC Transformers for DC Transmission and Distribution Grids (II)	Meeting Room 3 鼓楼厅	Hao Tu Reza Mirzadarani	
	Oral 38: Advanced Modulation, Control and Topology of DC-DC Converters (II)	Meeting Room 5 南街厅	Petar J. Grbovic Di Mou	
	Oral 39: EV Charging Technologies and Batteries	Meeting Room 6 宽巷厅	Zian Qin Lei Zhang	
	Oral 40: Advanced Modeling, Control Strategy, and Operations Management of AC/DC Microgrids	Meeting Room 7 窄巷厅	Yang Han Yajuan Guan	
	Oral 41: Fractional-Order and Emerging Power Electronics Technology in New Energy Vehicles and Aircraft	Meeting Room 9 金沙厅	Liangzong He Fengxiang Wang	
	Oral 42: Intelligent Battery Management	Meeting Room 10 文翁厅	Yunhong Che Xiaosong Hu	
	Oral 43: Advanced Control of AC Motor Drives (I)	Meeting Room 11 石室厅	Yanqing Zhang Lin Qiu	
	Oral 44: Reliability, Diagnosis, Prognosis and Testing of Power Electronics	Board Room 董事会议室	Yi Zhang Keiji Wada	
	Oral 45: Power Electronic Equipment for Distribution System Reliability Enhancement (I)	VIP Lounge 青羊厅	Wen Wang Qingsong Wang	
	10:00-10:30	Break		

May 20, Monday
Oral 46 - Oral 56

Time	Oral Session Title	Location	Chairs
10:30-12:00	Oral 46: Power Converters and Control (VI)	Meeting Room 1 琴台厅	Dong-Choon Lee Lei Zhang
	Oral 47: Topologies, Control and Applications of Multilevel Converters	Meeting Room 2 故里厅	Kui Wang Yong Yang
	Oral 48: Safety and Reliability of Passive Components and Energy Storage Systems	Meeting Room 3 鼓楼厅	Huai Wang Zhaoyang Zhao
	Oral 49: Artificial Intelligence and Advanced Technologies for Power Electronic Applications	Meeting Room 5 南街厅	Chenwei Ma Huayu Li
	Oral 50: Reliability Improvement Techniques for Power Electronics System (II)	Meeting Room 6 宽巷厅	Sanjay Chaudhary Jingfang Wang
	Oral 51: Advanced Control of AC Motor Drives (II)	Meeting Room 7 窄巷厅	Li Zhang Guoqiang Zhang
	Oral 52: Power Electronic Equipment for Distribution System Reliability Enhancement (II)	Meeting Room 9 金沙厅	Chuan Xie Zheng Gong
	Oral 53: Transient Support Technique For Grid-forming Converters	Meeting Room 10 文翁厅	Zhen Tian Yang Wang
	Oral 54: Emerging Techniques in Multilevel Converters	Meeting Room 11 石室厅	Jianyu Pan Mingzhe Wu
	Oral 55: Advanced Power Converters for Power Electronics System	Board Room 董事会议室	Tiesheng Yan Yajing Zhang
	Oral 56: Emerging Technologies for Power System	VIP Lounge 青羊厅	Yonghui Liu Gibran David Agundis Tinajero
12:00-13:30	Lunch 1933cafe 1933咖啡厅		
13:30-17:00	Technical Tours Hope Senlan Science and Technology Holding Corp., Ltd. 希望森兰科技股份有限公司		

Keynote Speakers



Prof. Rongjun Ding

*CRRC Zhuzhou Institute Co., LTD., China
Academician of Chinese Academy of Engineering*

Title : State-of-the-Art Power Semiconductor Device Technology

Abstract

Combined with the key application needs of high-end equipment fields such as rail transit and new energy vehicles, this report makes a comprehensive description of the development of power semiconductor chip design, module packaging and the related key technologies. It also puts forward constructive suggestions on a number of issues for future development.

Biography

Prof. Rongjun Ding is an academician of Chinese Academy of Engineering . His main research interests include power electronics and control technology . He is the director of the National Key Laboratory of Power Semiconductor and Integrated Technology , the chairman of the Power Semiconductor Industry Alliance , and the editor-in-chief of the journal "Locomotive Electric Transmission" . He is currently the chief scientist of CRRC and the dean of the School of CRRC Times Microelectronics , Southwest Jiaotong University .

Prof . Ding has long been engaged in innovative research and achievement transformation of power electronic devices , traction converter and AC transmission systems . He created a Chinese standard system and a technical model in line with the international standards . He has made significant contributions to the breakthrough development of Chinese railway from general load to heavy load , and from normal speed to high speed . He has presided and participated in more than 30 major scientific research projects at the national and provincial levels . He has received 1 National Invention Award , 2 second prize of National Science and Technology Progress Award , 3 provincial and ministerial outstanding prizes , 8 first prizes and 4 second prizes . He has received numerous prestigious awards, including the He Liang He Li Foundation Science and Technology Progress Award, the Tien-yow Jeme Railway Science and Technology Award, the Mao Yisheng Science and Technology Award, and has been selected for the "New Century National Hundred, Thousand and Ten Thousand Talent Project". He is also a National Model Worker, the Most Beautiful Railway Technology Worker, and a China Metro 50 Years Tribute Figure.



Prof. Dushan Boroyevich

Virginia Tech – CPES, USA
Member of the US National Academy of Engineering,
IEEE Life Fellow

Title: Future Systems for Transmission and Distribution of Electrical Energy

Abstract

One day every human being will be able to have as much energy as they need for enjoyable work and happy life, without harming the planet Earth that sustains us. The renewable technologies developed over the last 30 years can be sustainably and economically scaled-up to generate sufficient energy for all future human needs. Missing are the technologies to transport and distribute the free energy coming continuously from Sun to ten billion humans of tomorrow.

Today, only ~20% of the total human energy consumption is from electricity. Since almost all sustainable energy is first converted to electricity, we may need to build 4-10 additional grids in the next 30 years! But, constant-frequency synchronous electromechanical grid cannot balance constantly varying distributed generation with variable consumption instantaneously, and anyway, why would we build additional new power systems using the 150-year-old technology?

This presentation will outline possible power electronics solutions for transporting the energy from renewable electricity generation through a global network of undersea and underground electrical HVDC lines connected by electronic energy routers. The new electronic power system, could collect energy from wherever the sun is shining and wind is blowing and deliver it instantly, at the speed of light, to customers anywhere around the world. Just as we are now using Internet to talk and look at each other anywhere around the world.

Biography

Prof. Dushan Boroyevich received his Dipl. Ing. degree from the University of Belgrade in 1976 and his M.S. degree from the University of Novi Sad in 1982, in what then used to be Yugoslavia. He received his Ph.D. degree in 1986 from Virginia Tech, Blacksburg, USA. From 1986 to 1990, he was an assistant professor and director of the Power and Industrial Electronics Research Program at the University of Novi Sad. He then joined the Bradley Department of Electrical and Computer Engineering at Virginia Tech as associate professor. He is now University Distinguished Professor and Associate Vice President for Research and Innovation in Energy Systems at Virginia Tech. He was the president of IEEE Power Electronics Society for 2011-12.

Prof. Boroyevich is a member of the US National Academy of Engineering and is recipient of 4 honorary professorships in China and Taiwan, as well as numerous other awards, including the IEEE William E. Newell Power Electronics Technical Field Award and the European Power Electronics Association Outstanding Achievement Award. His research interests include electronic power distribution systems, multi-phase power conversion, power electronics systems modeling and control, and integrated design of power converters. Dushan was a mentor for almost 50 Ph.D. dissertations and 50 M.S. theses.



Prof. Sheng Liu

Wuhan University, China
Academician of Chinese Academy of Sciences,
IEEE Fellow

Title: DFX: Design and Manufacturing of Power Electronics Chips and Packaging Based on Digital Twin Technology

Abstract

This lecture first briefly introduces the development of semiconductor materials, power electronic devices and their applications. It focuses on the three major industry pain points in the application of power electronic devices, thereby leading to DFX, that is, the design and manufacturing of power electronic chips and packages based on digital twin technology, and the importance to the development of the industry. At the same time, the report introduces in detail the development and application of digital twin technology in the field of power electronics technology. It includes the innovative theory of chip and package design and manufacturing technology based on digital twin, the digital twin technologies in material analysis, characterization and testing. It also covers the chip and package reliability and manufacturability design, virtual manufacturing, key equipment research and development. The future development direction of power electronics field facing the pain point of the industry is then put forward.

Biography

Prof. Sheng Liu received the Ph.D. degree from Stanford University, USA in 1992. He was selected as a Distinguished Professor of Changjiang Scholars in 2004, and was selected as one of the first batch of "Thousand Talents Program". He was elected as ASME Fellow (2009), IEEE Fellow (2014), and academician of the Chinese Academy of Sciences (Ministry of Technical Science) on November 22, 2023. Prof. Sheng Liu has published more than 740 articles, applied for and authorized more than 400 Chinese invention patents and U.S. patents. He organized and hosted 8 international conferences, and authored 6 monographs. He won the White House Presidential Professor Award (1995), American ASME Young Engineer Award (1996), International Society of Microelectronics and Packaging (IMAPS) Technical Contribution Award (1997), China Outstanding Youth Fund (1999), NSF Young Scientist Award (1995), IEEE CPMT Outstanding Technical Achievement Award (2009), and Electronic Packaging Technology Special Achievement Award from Chinese Institute of Electronics (2009). He Won the first prize of China Federation of Logistics and Purchasing (2009), the second prize of Electronic Information Science and Technology of China Institute of Electronics (2009), the First prize of Technological Invention Award of the Ministry of Education (2015), the second prize of National Technological Invention Award (2016), and the first prize of Technological Invention of China Institute of Electronics (2018). In addition, he won the first prize of the National Science and Technology Progress Award (2021), the Most beautiful Scientist in Hubei Province (2022), and the title of "Wuhan Model" (2022).



Prof. Jose Rodriguez

*Universidad San Sebastian, Chile
Member of the Chilean Academy of Engineering,
IEEE Life Fellow*

Title: Model Predictive Control: Basic concepts, Applications, Advances and Challenges

Abstract

Model Predictive Control (MPC) emerged years ago as an attractive control strategy for power electronics systems. Main advantages of MPC are the simple concept, the capability to include easily different control objectives and the high dynamic performance. On the contrary, like any new strategy, it also has disadvantages such as dependence on the mathematical model, dependence on the parameters and a variable frequency spectrum. However, thanks to the work carried out by the scientific community, most of these disadvantages has been resolved. This talk aims to introduce the audience to MPC and show them its evolution and applications. Special attention will be given to use of MPC in multilevel inverters using few calculations and how to avoid the use of weighting factors. The presentation will also present the evaluation to be used in high power drives and in electric vehicles. Finally, this talk will discuss the challenges that MPC must overcome to be adopted by the industry.

Biography

Prof. Jose Rodriguez received the Dr.-Ing. degree in electrical engineering from the University of Erlangen, Erlangen, Germany, in 1985. He has been with the Department of Electronics Engineering, Universidad Tecnica Federico Santa Maria, since 1977, where he was full Professor and President. Since 2015 to 2019 he was the President of Universidad Andres Bello in Santiago, Chile. Since 2022 to 2023 he was President of Universidad San Sebastian in Santiago, Chile. Now, he is the Director of the Center for Energy Transition at Universidad San Sebastian. He has coauthored two books, several book chapters and more than 700 journal and conference papers. His main research interests include multilevel inverters, new converter topologies, control of power converters, and adjustable-speed drives. He has received a number of best paper awards from journals of the IEEE. Dr. Rodriguez is member of the Chilean Academy of Engineering. In 2014 he received the National Award of Applied Sciences and Technology from the government of Chile. In 2015 he received the Eugene Mittelmann Award from the Industrial Electronics Society of the IEEE. In years 2014 to 2023 he has been included in the list of Highly Cited Researchers published by Web of Science.



Prof. Makoto Takamiya

The University of Tokyo, Japan

Title: Injecting Digital into Power Electronics via Gate Driver ICs

Abstract

In order to enhance the value of power electronics and provide new services to users in the future, it will be necessary to "digitalize power electronics" by collecting data deep inside circuits and devices using various sensors and changing the operation of circuits and devices adaptively by analyzing such data.

The gate terminals of power devices are the key interface in the digitalization of power electronics, because the gate terminals serve as an intermediary between the "world of information technology and control" operating at low voltages of 5V or less, and the "world of power electronics" operating at high voltages.

In this talk, "digital gate driver IC" and "sensing technology for power devices via gate terminals integrated in gate driver IC" will be introduced as examples of research to realize "digitalization of power electronics" via gate terminals.

Digital gate driver ICs can break the trade-off between switching loss and switching noise (surge, EMI) by changing the gate current waveform that drives power devices.

In "sensing technology via gate terminal", the collector/drain current, junction temperature, and bond wire lift-off of power devices can be estimated by monitoring the gate voltage waveform of the power devices. Since these sensor circuits are integrated into gate driver ICs, they have the advantage of small area and low cost.

Biography

Prof. Makoto Takamiya received the B.S., M.S., and Ph.D. degrees in electronic engineering from the University of Tokyo, Japan, in 1995, 1997, and 2000, respectively. In 2000, he joined NEC Corporation, Japan, where he was engaged in the circuit design of high speed digital LSI's. He joined University of Tokyo, Japan in 2005, where he is now a Professor of Institute of Industrial Science. From 2013 to 2014, he stayed at University of California, Berkeley as a visiting scholar. His research interests include the digital gate driver and sensor ICs for power electronics and the integrated power management circuits for automotive and industrial applications. He is an elected member of administrative committee in IEEE Solid-State Circuits Society from 2023 to 2025. He is a member of the technical program committee of IEEE Symposium on VLSI Technology and Circuits, IEEE Asian Solid-State Circuits Conference, and IEEE International Symposium on Power Semiconductor Devices and ICs. He was a Distinguished Lecturer of IEEE Solid-State Circuits Society from 2019 to 2020. He received 2009 and 2010 IEEE Paul Rappaport Awards and the best paper award in 2013 IEEE Wireless Power Transfer Conference.



Prof. Jung-Ik Ha

Seoul National University, Korea
IEEE Fellow

Title: Progress, Status, and Challenges in Electric Motor Drive Technology

Abstract

Many motor drive researchers have improved performance and competitiveness - including the size, efficiency, control bandwidth, functions, and costs in various energy conversion applications. The technological improvement of the permanent magnet, core material, water cooling, and design method has enabled high power-density and efficient motors. The technologies of wide-bandgap power devices, digital signal processing, control theory, and information also have opened high-performance inverter generations. Moreover, machine learning technology is accelerating the functionality and performance improvement of motor drives. This talk will review our recent progress and status in motor drives and explore challenges and future in motor drives.

Biography

Prof. Jung-Ik Ha (Fellow, IEEE) received the B.S., M.S., and Ph.D. degrees in electrical engineering from Seoul National University, South Korea, in 1995, 1997, and 2001, respectively. From 2001 to 2002, he was a Researcher with YASKAWA Electric Corporation, Japan. From 2003 to 2008, he was with SAMSUNG Electronics, South Korea, as a Senior and Principal Engineer. From 2009 to 2010, he was the Chief Technology Officer with LS MECAPION, South Korea. Since 2010, he has been with the Department of Electrical and Computer Engineering at Seoul National University where he is currently a Professor. He is also with Seoul National University Electric Power Institute, Seoul. From 2016 to 2017, he was a Visiting Scholar with the Massachusetts Institute of Technology, MA, USA, and the Editor-in-Chief of the Journal of Power Electronics, Springer. He is the vice president of the Korean Institute of Power Electronics and the director of inter-university collaborative research centers funded by SAMSUNG, LG, and Hyundai. He has authored more than 300 papers and patents published on power electronics and motor drives. His current research interests include circuits and control in high efficiency and integrated electric energy conversions for various industrial fields.



Prof. Shibin Gao

Southwest Jiaotong University, China

Title: Rail Transit "Grid-Source-Storage-Vehicle" Collaborative Power Supply

Abstract

In the context of global "carbon reduction", how can traction power supply systems achieve new energy access and system-wide energy saving? This report briefly introduces the background of energy saving and emission reduction of electrified railways in China, and focuses on the phased research results of the National Key Research and Development Program - "grid-source-storage-vehicle" coordinated power supply technology for rail transit, including the technical architecture of the "grid-source-storage-vehicle" coordinated power supply system, power conversion equipment research and development, energy management methods, and functional verification.

Biography

Prof. Shibin Gao is the recipient of the Guanghua Engineering Science and Technology Award, He Liang He Li Foundation science and Technology Progress Award, the National innovation Medal, and Tien-yow Jeme Railway Science and Technology Award. He received his master's and doctoral degrees in Railway Traction Electrification and Automation, Power System and Automation from Southwest Jiaotong University in 1988 and 2004. He currently serves as a Chief Professor at Southwest Jiaotong University and the Director of the National Rail Transit Electrification and Automation Engineering Technology Research Center. Additionally, he holds various committee positions, including the Member of the Technical Committee of the National Railway Administration, etc.

Prof. Gao's primary research focus lies in high-speed railway power supply and automation. He has taken on leadership roles in national key research and development projects and natural science foundation key projects. He has published five monographs, six textbooks, and 293 high-level academic papers. As the first executive, he has received two Second Prizes of the National Science and Technology Progress Award and one Second Prize of the National Teaching Achievement Award.



Prof. Shuo Wang

University of Florida, USA
IEEE Fellow

Title: Advances and Challenges in the Modeling and Suppression of Electromagnetic Interference for Power Electronics Systems

Abstract

Modern power electronics systems employ switching-mode power conversion to achieve high power density and efficiency. However, the switching mode power conversion leads to high Electromagnetic Interference (EMI) noise, which can compromise the proper operation of power converters and the electronics circuits nearby, resulting in safety, reliability, and stability issues. Recently, due to the wide adoption of wide bandgap (WBG) devices, the switching speeds and switching frequencies of the power conversions have significantly increased, resulting in higher EMI not only in the conventional conductive EMI frequency range but also in the radiated EMI frequency range. Due to the lack of understanding of EMI in power electronics systems, conventional EMI suppression and EMI filter design mostly follow a trial-and-error approach, which is ineffective and costly. EMI modeling theory has been developed to help researchers and engineers understand the generation and propagation of EMI and its relationship to the operations of power conversions. Based on the developed EMI models, cost-effective EMI suppression techniques can be developed. For this important topic, this presentation will introduce the most recent advances in EMI modeling and suppression techniques and the EMI challenges due to the high speed of WBG devices in power electronics systems.

Biography

Prof. Shuo Wang received a Ph.D. degree in Electrical Engineering from Virginia Tech, a Master's degree from Zhejiang University, and a Bachelor's degree from Southwest Jiaotong University. He is a tenured full professor with the Department of Electrical and Computer Engineering, University of Florida, Gainesville, FL.

Dr. Wang's research interests include power electronics, electromagnetic interference, electromagnetic compatibility, electromagnetic security, cybersecurity, and hardware security. Dr. Wang has more than 20 years of research experience in the modeling, measurement, and suppression of EMI for power electronics systems. He has been an IEEE Fellow since 2019.

Dr. Wang has published more than 250 IEEE journal and conference papers and holds more than 30 pending/issued US/international patents. He received the Best Transaction Paper Award from the IEEE Power Electronics Society in 2006, two William M. Portnoy Awards from

the IEEE Industry Applications Society in 2004 and 2012, and the Distinguished Paper Award from the IEEE Symposium on Security and Privacy in 2022. In 2012, he received the National Science Foundation CAREER Award. He is an Associate Editor for the IEEE Transactions on Industry Applications and IEEE Transactions on Electromagnetic Compatibility. He was a technical program Co-Chair for the IEEE 2014 International Electric Vehicle Conference.



Prof. Johann Walter Kolar

ETH Zurich, Switzerland
IEEE Fellow

Title: eVTOL Aircraft - The Future of Urban Air Mobility

Abstract

Urbanization is a megatrend of the 21st century with a projected 68% of the global population living in urban areas by 2050. The associated increase in population density will further intensify road traffic congestion and the associated productivity losses which already today are problematic. This boosts interest in Urban Air Mobility (UAM) utilizing the three-dimensional air space for transportation and allowing to bypass overcrowded streets with currently 250 companies conducting research and a projected yearly market volume of 90 billion USD by 2050. In this context, all electric Vertical Takeoff and Landing (eVTOL) aircraft allow to leverage the specific advantages of helicopters, i.e., vertical take-off and landing with low space requirements, and airplanes, i.e., energy efficient fixed-wing cruising. Moreover, electric drive trains are advantageously, highly efficient and with an increase in sustainable electric energy generation (and thanks to air travel on a direct and/or straight trajectory towards the target destination) eVTOL aircraft may even compete with internal combustion and electric vehicles in terms of energy consumption and greenhouse gas emissions.

The talk first introduces key eVTOL aircraft designs currently in the R&D, prototyping or production planning phases, discusses trade-offs of key performance indicators and highlights critical enabling technologies like high gravimetric energy density and/or high-power-density batteries and fuel cells, low-specific-weight electric motors, and advanced power electronics. Hybrid battery/fuel cell power supplies of eVTOL aircraft enable high peak power capability as well as long-range operation. However, the typically wide and overlapping voltage ranges of the batteries and the fuel cells require interconnecting bidirectional DC-DC converters with buck-boost capability.

Accordingly, the second part of the presentation comparatively evaluates performance limits of fully soft-switched, flying-capacitor-multilevel, and partial-power-processing buck-boost candidate converter topologies by means of comprehensive Pareto optimizations considering mission profile efficiency and gravimetric power density, and finally presents a 15kW 450V . . .730V / 480V . . .800V three-level flying capacitor converter module of a 150kW system featuring 98.5% efficiency and an unprecedented gravimetric power density of 62kW/kg.

Finally, a summary of first assessments of the primary energy and Greenhouse Gas Emissions impacts of eVTOLs vs. ground-based light-duty vehicles for passenger mobility is presented, which surprisingly indicates partly higher energy efficiencies than equivalent terrestrial alternatives at faster and more predictable travel times, and indicates a possible niche role of eVTOLs in future sustainable urban transportation.

Biography

Prof. Johann W. Kolar is a Fellow of the IEEE, an International Member of the US NAE and a Full Professor and Head of the Power Electronic Systems Laboratory at the Swiss Federal Institute of Technology (ETH) Zurich. He has proposed numerous novel converter concepts incl. the Vienna Rectifier, has spearheaded the development of x-million rpm motors, and has pioneered fully automated multi-objective power electronics design procedures. He has personally supervised 90 Ph.D. students to completion, has published 1000+ IEEE journal and conference papers and 4 book chapters, and is named as inventor or co-inventor in 200+ granted patents assigned to international industry research partners. He has served as IEEE PELS Distinguished Lecturer from 2012 - 2016. He has received numerous awards incl. 45+IEEE transactions and conference Prize Paper Awards, the 2016 IEEE William E. Newell Power Electronics Award, and 2 ETH Zurich Golden Owl Awards for excellence in teaching.



Prof. Issa Batarseh

University of Central Florida, USA
IEEE Fellow

Title: Energy Access and Energy Transition: Challenges and Opportunities

Abstract

Energy access and energy transition rapid changes underway are expected to bring opportunities in new technology solutions in integrated PV solar, battery storage, electrified transportation, and microgrids. This is why solar energy conversion technologies and energy storage systems will play a major role in any future sustainable solution. Years of human ingenuity with governmental and industrial support have reduced the electricity cost from solar and wind sources to match that from natural gas. In this talk, Dr. Batarseh will discuss the emerging power electronics and power systems technologies and their role in transforming the grid into a more distributed configuration will require system capabilities well beyond today's simple grid-tied PV inverters. A review of new advanced grid forming technologies that support the US's energy transition to a renewable energy-based future, to enable higher penetration of solar energy into the grid by delivering integrated, efficient, and reliable solar plus storage solutions. An overview of other active research projects in grid control and energy storage at the Florida Power Electronics Research Center at the University of Central Florida will also be presented.

Biography

Prof. Issa Batarseh is currently a Pegasus Professor of electrical engineering in the Department of Electrical and Computer Engineering at the University of Central Florida (UCF) and serving as the director of the Florida Power Electronics Center. His research interests focus on energy conversion technologies in high-frequency, high-efficiency, and smart grid-tied PV energy conversion systems. His research team has been leading the design, development, and commercialization of smart microinverters and other technologies. He has published more than 100 journals, 450 conference papers, and 37 Issued US Patents, and graduated 43 Ph.D. students and 45 MS students. He is a book author entitled "Power Electronics - Circuit Analysis and Design", 2nd Edition, Springer 2018. Was the recipient of the University Pegasus Professor, highest academic honor, and received the IEEE PELS R. David Middlebrook Achievement award. He has co-founded three start-up companies. He is a Fellow of the IEEE and AAAS, a member of the National Academy of Inventors (NAI), and has been inducted into the Florida Inventors Hall of Fame. Dr. Batarseh is a Registered Professional Engineer in the State of Florida.



Tutorial 1: Modeling and Control of Grid-Tied Converters for Distributed Energy Resources

Date & Time: May 17, 13:30~15:30

Location: Meeting Room 10 (文翁厅)

Lecturers: Jingyang Fang, Hao Tian, Tao Xu, Feng Gao

Abstract

Distributed energy resources, such as solar photovoltaics (PV) and wind, generally penetrate into modern power grids via grid-tied converters, which determine the active/reactive power injection and current/voltage quality, thereby making themselves the enabler of distributed energy sources. However, the large-scale deployment of grid-tied converters challenges the secure and reliable operation of modern power grids in terms of stability and power quality at both converter and system levels. Typical challenges include the loss of inertia and damping, reduced grid strength, and over-current problem as well as excessive circulating currents, current/voltage harmonics, synchronization, etc. To overcome such challenges, accurate modeling and advanced control of individual and multiple grid-tied converters are expected. To this end, the tutorial will comprise the following aspects: modeling and control of grid-forming converters, advanced multilevel converters with novel topologies and grid-supportive services, and multiple grid-tied converters with self-synchronized carrier waves. The tutorial targets at stability analysis and improvement, delivery of grid-supportive services, high-efficient and low-cost power converter design, synchronization without dedicated communication cables, switching harmonic suppression, and circulating current attenuation of grid-tied converters for distributed energy sources. In particular, the tutorial will cover some state-of-the-art industrial products and their design experience.

Biography



Jingyang Fang received the Ph.D. degree from School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore, in 2019. From August 2019 to August 2021, he was a Postdoctoral Researcher with the Duke University and TU Kaiserslautern. Since August 2021, he has joined School of Control Science and Engineering, Shandong University as a Full Professor. His research interests include power quality control,

stability analysis and improvement, renewable energy integration, and digital control in more-electronics power systems. Dr. Fang was a recipient of the Humboldt Research Fellowship, National Excellent Young Scientists (Overseas), two IEEE Prize Paper Awards, one Best Presenter Award, the IEEE JESTPE Star Reviewer Award, and the Best Thesis Award from NTU. He was World's Top 2% Highly Cited Scientists ranked by Stanford University.



Hao Tian received the Ph.D. degree in energy system from the University of Alberta, Edmonton, AB, Canada, in 2019. After that, he was a Postdoctoral Research Fellow with the University of Alberta until 2022. Since 2023, he has been a Full Professor with Shandong University, Jinan, China. His research interests include multilevel topology and PWM, high-power converter control, and power quality of hybrid ac-dc microgrids. Dr. Tian was a recipient of National Excellent Young Scientists (Overseas) and several IEEE awards, including 2022 IEEE TPEL Outstanding Reviewer Award, best paper award, and best presenter award. He was ranked as 2023 World's Top 2% Highly Cited Scientists by Stanford University.



Tao Xu received his Ph.D degree in electrical engineering from Shandong University, Jinan, China, in 2019. From September 2017 to September 2018, he was a Visiting Scholar at the Institute of Energy Technology, Aalborg University, Aalborg, Denmark. Since 2019, he joined Shandong University, where he is currently an associate professor. Tao Xu was the recipient of the IEEE Power Electronics Transactions Second Prize Paper Award in 2017, the IEEE PELS Prize Ph.D. Thesis Talk in 2019 and the First Prize for Technical Invention Award of China Power Supply Society. His research interests are parallel inverters, power quality, modulation methods and reliability. He has published more than 40 papers in the fields of power electronics.



Feng Gao received the Ph.D. degree from the School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore, in 2009. From September 2006 to February 2007, he was a Visiting Scholar with the Department of Energy Technology, Aalborg University, Aalborg, Denmark. From 2008 to 2009,



he was a Research Fellow with Nanyang Technological University , Singapore . Since 2010 , he has been with Shandong University , Jinan , China , where he is currently a Professor with the School of Control Science and Engineering . Dr . Gao is currently an Associate Editor for IEEE TRANSACTIONS ON POWER ELECTRONICS and CPSS TRANSACTIONS ON POWER ELECTRONICS AND APPLICATIONS . He was the recipient of the IEEE Industry Applications Society Industrial Power Converter Committee Prize for a paper published in 2006 and 2017 IEEE Power Electronics Transactions Second Prize Paper Award .

**Tutorial 2:
Model Predictive Control: Basic concepts, Applications, Advances and Trends**

Date & Time: May 17, 13:30~15:30

Location: Meeting Room 11 (石室厅)

Lecturers: Jose Rodriguez, Zhenbin Zhang, Fengxiang Wang, Lin Qiu, Chenwei Ma

Abstract

Model Predictive Control (MPC) emerged few decades ago as an attractive control strategy for power electronics systems . Main advantages of MPC are the simple concept , the capability to include easily different control objectives and the high dynamic performance . On the contrary , like any new strategy , it also has disadvantages such as dependence on the mathematical model , dependence on the parameters and a variable frequency spectrum . However , thanks to the work carried out by the scientific community , each of these disadvantages has been resolved . This tutorial aims to introduce the audience to MPC and show them its evolution and applications . It is for this reason that this tutorial is organized into three main sections: i) provide the basic concepts of MPC operation; ii) show the main MPC applications in drives , photovoltaic and grid connection; iii) Finally , the objective is to show the audience the most relevant trends of MPC . It is expected that the audience will be able to obtain in this tutorial an overview of MPC , observe the main developments according to the various applications of power electronics and will obtain an overview of the progress of MPC and how they have been resolved to improve the strategy .



Biography



Jose Rodriguez (M'81-SM'94-F'10-LF'20) received the Dr.-Ing. degree in electrical engineering from the University of Erlangen , Erlangen , Germany , in 1985 . He has been with the Department of Electronics Engineering , Universidad Tecnica Federico Santa Maria , since 1977 , where he was full Professor and President . Since 2015 to 2019 he was the President of Universidad Andres Bello in Santiago , Chile . Since 2022 to 2023 he was President of Universidad San Sebastian in Santiago , Chile . Now , he is the

Director of the Center for Energy Transition at Universidad San Sebastian . His main research interests include multilevel inverters , new converter topologies , control of power converters , and adjustable-speed drives . Dr . Rodriguez is member of the Chilean Academy of Engineering . In 2014 he received the National Award of Applied Sciences and Technology from the government of Chile . In 2015 he received the Eugene Mittelmann Award from the Industrial Electronics Society of the IEEE .



Zhenbin Zhang (Senior Member , IEEE) received the Ph .D . degree at the Institute for Electrical Drive Systems and Power Electronics (EAL) , Technical University of Munich (TUM) , Germany , with "summa cum laude" . Since 2017 , he has held the position of full professor and International Collaboration Ambassador of Shandong University , China . In 2019 , he was selected as a recipient of China's "1000-Talent-Plan" . In 2022 , he was also elected as IET Fellow . Dr . Zhang is a recipient of the VDE-Award , Germany .

In addition , he was elected the general chair of IEEE-PECED-2021 conference , and Associate Editor of IEEE Transactions on Power Electronics . His research interests include power electronics and electrical drives , sustainable energy systems , smart- and microgrids .



Fengxiang Wang (Senior Member , IEEE) was born in Jiujiang , China , in 1982 . He received the Ph .D . degree from the Institute for Electrical Drive Systems and Power Electronics , Technische Universitaet Muenchen , Munich , Germany , in 2014 . He is currently a Full Professor and Deputy Director with the Quanzhou Institute of Equipment Manufacturing , Haixi Institutes , Chinese Academy of Sciences , Jinjiang , China . His research interests include predictive control and sensorless control for electrical

drives and power electronics . He organized the IEEE 5th International Symposium on Predictive Control of Electrical Drives and Power Electronics (PRECEDE) as the General Chair . He is also an Associate Editor for IEEE Transactions on Industrial Electronics and IEEE Transactions on Energy Conversion . He is an IET Fellow .



Lin Qiu (Senior Member , IEEE) received the B .S . and Ph .D . degrees in electrical engineering from the Department of Electrical Engineering , Tsinghua University , Beijing , China , in 2011 and 2017 , respectively . He serves as a Research Professor at the School of Electrical Engineering , Zhejiang University , and holds the position of Adjunct Professor at the University of Illinois Urbana-Champaign . His primary research focuses on the integrated energy systems for traction power supply in rail transportation and data-driven nonlinear control for power electronics .



Chenwei Ma received the PhD degree in electromechanical engineering from Ghent University , Ghent , Belgium , in 2021 . He was with Flanders Make (the Belgian national strategic research center) as a research assistant . He has been with the Department of Electromechanical , Systems and Metal Engineering , Ghent University as a postdoctoral researcher since 2021 . In 2022 he joined the Department of Electrical Engineering , Southwest Jiaotong University , Chengdu , China , where he is currently an Assistant Professor . His current research interests include motor drives , model predictive control and data-driven techniques applied to power converters and electric drives .

**Tutorial 3:
Design, Analysis, and Control of Advanced Electric Machines**

Date & Time: May 17, 13:30~15:30

Location: Meeting Room 1 (琴台厅)

Lecturer: Chunhua Liu

Abstract

Electric machines are welcomed for electrified propulsion systems , such as electric vehicles , electric aircraft , electric ships , electric robotics , etc . Also , they are popularly used for renewable energy generation , such as wind power generation , water power generation , etc . This tutorial will explore the latest advancements of electric machines in



magnet materials , geometries , and configurations , aiming to achieve higher power density and efficiency . Through case studies and practical examples , it will showcase innovative design techniques that enable the development of advanced electric machines . Moreover , the tutorial will focus on advanced modeling and analysis methods for electric machines . It will cover various analytical modeling approaches , optimization techniques , and multi-physics analysis tools . Attendees will gain insights into how to accurately simulate and predict the performance of electric machines , allowing for informed design decisions and performance improvements . In addition , the tutorial will introduce the application of different control strategies to advanced motor drive control systems , such as sensorless control , fault-tolerant control , model predictive control , etc . The control framework aims to achieve the unique dynamic performances and advantages in different applications .

Biography



Chunhua Liu is Professor in electrical and electronic engineering at the School of Energy and Environment with City University of Hong Kong , Hong Kong SAR . His research interests include electric machines and drives , electric vehicles and aircraft , electric robotics and ships , renewables and microgrids , power electronics and wireless power transfer . He is an RGC Research

Fellow , Distinguished Lecturer of IEEE Vehicular Technology Society (VTS) , and World's Top 2% Scientists according to metrics compiled by Stanford University . Also , he is Chair & Founder of both Hong Kong Chapter , IEEE Vehicular Technology Society , and Hong Kong & Guangzhou Joint Chapter , IEEE Industrial Electronics Society , respectively . Prof . Liu is now an Associate Editor of IEEE Transactions on Industrial Electronics , Editor of IEEE Transactions on Vehicular Technology , Editor of IEEE Transactions on Energy Conversion , and Editor of IEEE Power Engineering Letters . Also , he is an Editor of Energies , Subject Editor of IET - Renewable Power Generation , Associate Editor of Open Journal of the Industrial Electronics Society , Associate Editor of IEEE Access; Associate Editor of IEEE Chinese Journal of Electrical Engineering , Associate Editor of CES Transactions on Electrical Machines and Systems , Associate Editor of Elsevier Green Energy and Intelligent Transportation , and Editor of IEEE Transactions on Magnetics - Conference , respectively .

**Tutorial 4:
High-Power Converters for Power-to-X Applications**

Date & Time: May 17, 13:30~15:30

Location: Meeting Room 2 (故里厅)

Lecturers: Stig Munk-Nielsen, Mingzhi He, Morten Rahr Nielsen

Abstract

The International Renewable Energy Agency (IRENA) soberly forecast that in 2030 , the global need for green hydrogen will be 125 million tons/year to fulfill the 1.5°C climate goal articulated in the Paris Agreement . In comparison , the annual production of green hydrogen in 2021 was less than 1 million tons/year globally . This emphasizes the urgent need for political awareness to secure a solid financial foundation for a sustainable future . 100 billion USD needs to be invested into green hydrogen technologies annually from 2023 to 2030 (1 billion USD in 2022) to secure an x500 increase in total installed electrolyzer capacity of more than 400 GW in 2030 (~1 GW in 2022) .

This tremendous upscaling in electrolyzer capacity includes power supplies , electrolyzer stacks , and balance of plants . This tutorial dives deep into the perspectives and challenges related to upscaling power supplies for electrolyzer plants . The state-of-the-art high-power converter intended for Power-to-X applications is dominated by the 24/48-pulse silicon-controlled rectifier (SCR) technology . In continuation hereof , prospects regarding the next generation of high-power converters will be shared . The societal requirements for electrolyzer power supplies are low cost and high reliability favoring the thyristor technology . Besides , modeling of the electrolyzer together with energy management strategies for renewable energy hydrogen production are included in the tutorial . At last , perspectives on the current and future trends for large gigawatt electrolyzer plants will be presented .

Biography



Stig Munk-Nielsen received the M .Sc . and Ph .D . degrees from Aalborg University , Denmark , in 1991 and 1997 , respectively . He is currently a full professor and the head of the section at the Department of Energy , Aalborg University . His research interests include LV and MV power converters , packaging , and power converter circuits . Since 2013 , he has been funded for a die packaging team and a corresponding laboratory facility . The packag-

ing facility inaugurated in 2017 is a key enabler for the goal of achieving a digital design framework . In the past ten years , he was the principal investigator of more than 20 research projects in collaboration with industry partners . He has published around 250 peer-reviewed papers on power electronics being a co-author or author and has been granted 5 international patents .



Mingzhi He is a professor at Sichuan University , a doctoral supervisor , a national scientific and technological innovation , and entrepreneurial talent (WR) , and enjoys the State Council Government Special Allowance . For many years , he has been engaged in the field of power electronics and power transmission in high-end equipment manufacturing key technology research , core technology and product development , personnel training; in

the important electrolysis hydrogen , electroplating , renewable energy generation , and other areas of dozens of key projects in research and development .



Morten Rahr Nielsen received the M .Sc . degree in Energy Engineering , with a specialization in Power Electronics and Drives , from AAU Energy , Aalborg University , Denmark , in 2022 . He is currently a Research Assistant with AAU Energy , Aalborg University , working on three ongoing projects focusing on Power-to-X . The projects are Lighthouse South (Development of a 50 kW Medium Voltage Converter for PtX) , ComELCo (Competitive

Electrolyzer Converter) , and ECoGrif (Efficient Cost Saving Grid Friendly Power-to-X Converter) . His research interests include semiconductor devices , control of medium voltage converters , and Power-to-X applications .

**Tutorial 5:
Stability and Control of Grid-Forming Converters**

Date & Time: May 17, 13:30~15:30

Location: Meeting Room 3 (鼓楼厅)

Lecturers: Xiongfei Wang, Heng Wu

Abstract

The grid-forming (GFM) technology is emerging as a promising approach for massive integration of inverter-based resources (IBRs) into electrical grids. Being controlled as a voltage source behind an impedance, GFM-IBRs can provide adequate services to enhance the reliability and resilience of the power network, and they also feature higher stability robustness against grid strength variation than conventional IBRs. In recent years, there is a growing consensus on the need of GFM-IBRs in the future power electronic dominated power systems. Many research and development (R&D) efforts have been initiated, by governments, power system operators, energy developers, and vendors of IBRS, on the technical specifications/grid codes, hardware and control solutions for GFM-IBRs.

This tutorial intends to cover both the basics and advances in GFM-IBRs that can fit the requirements of the evolving technical specifications/grid codes. The tutorial will start with the basic principles and typical control architectures of GFM-IBRs, which will be followed by the small-signal modeling, stability analysis, and damping control to guarantee the small-signal stability of GFM-IBRs considering different DC-link dynamics under various grid strengths. Then, the dynamics analysis of GFM-IBRs under large grid disturbances, e.g., grid faults and phase jumps, will be performed, covering the transient stability analysis, current limitation strategies, as well as GFM service provisions. In the end, perspectives on the prospects and challenges with the grid integration of GFM-IBRs will be shared.

Biography



Xiongfei Wang is a Professor at KTH Royal Institute of Technology, Sweden, and a part-time Professor with AAU Energy, Aalborg University, Denmark. He has been active tutorial instructors (e.g., PEDG, APEC, ECCE, EPE, eGrid) on stability and control of inverter-based resources and power systems. Dr. Wang is an IEEE Fellow and the recipient of the Richard M. Bass Outstanding Young Power Electronics Engineer Award, the IEEE

PELS Sustainable Energy Systems Technical Achievement Award, the Isao Takahashi Power Electronics Award, and of the Clarivate Highly Cited Researcher during 2019-2021.



Heng Wu is currently an Assistant Professor with AAU Energy, Aalborg University, Denmark. His research interests include the modelling and stability analysis of the power electronic based power systems. He is the Chairman of IEEE Task Force on Frequency-domain Modeling and Dynamic Analysis of HVDC and FACTS, the subgroup leader of CIGRE working group B4/C4.93

"Development of grid forming converters for secure and reliable operation of future electricity systems", and the member of GB grid forming best practice expert group formed by national grid ESO, U.K. He is identified as world's top 2% scientist by Stanford University from 2019.

Tutorial 6: SiC MOSFET Gate Drivers for High-Power Applications

Date & Time: May 17, 13:30~15:30

Location: Meeting Room 5 (南街厅)

Lecturers: Drazen Dujic, Chengmin Li

Abstract

As the next-generation power devices, SiC MOSFETs are gradually increasing their presence in a wide range of applications. Compared with the silicon counterparts, SiC MOSFET has higher voltage blocking capability, high switching frequency and potential high-temperature capability. These superior characteristics will significantly improve the performance of power conversion systems where efficiency and power density are the most critical performances. As the link between the control and power in the power electronics system, gate driving of SiC MOSFETs is critical to fully utilize the potential of the devices. However, simply leveraging solutions for Si devices are not enough. The challenges brought by high-speed switching, reliability-related issues and cost constraints require continuous work. This tutorial covers the basics of the SiC devices, the ultra high-speed switching characteristics, the gate driving principles and device protections, as well as the high power applications of SiC MOSFETs. This will be supported by practical examples and learnings of the authors from Power Electronics Laboratories at EPFL, Switzerland and TU/e, Netherlands.

Biography



Drazen Dujic is an Associate Professor and Head of the Power Electronics Laboratory at EPFL in Lausanne, Switzerland. He received his PhD degree from Liverpool John Moores University in 2008. From 2009 to 2013 he was with ABB Switzerland and has joined EPFL in 2014. His research interests include the areas of design and control of advanced high-power electronic systems

and high-performance drives , predominantly for the medium voltage applications related to electrical energy generation , conversion and storage .



Chengmin Li is an Assistant Professor at TU/e in Eindhoven , Netherlands . He was a Postdoctoral researcher at Power Electronics Laboratory at EPFL in Lausanne , Switzerland from 2020 to 2023 . He received the Ph .D . degree from Zhejiang University , Hangzhou , China in 2019 . From March 2016 to March 2017 , he was a Research Intern with the GE Global Research Center , Shanghai , China . His research interests are related to medium voltage high converters and application of SiC power MOSFETs . Dr . Li was the recipient of PCIM Asia Young Engineer Award in 2022 .

Tutorial 7:
Modelling and Control of Wireless Power Transfer: State of the Art

Date & Time: May 17, 13:30~15:30

Location: Meeting Room 7 (窄巷厅)

Lecturers: Minfan Fu, Yun Yang, Yong Li

Abstract

In recent times , there has been a resurgence of interest in wireless power transfer (WPT) , driven by the pressing need to wirelessly charge a multitude of consumer electronic devices such as smartphones , laptops , tablets , medical implants , and various peripherals . End users aspire to sever the final physical connection , the electrical charging wire , so that , for the first time , both information and power can be accessed ubiquitously through the air . WPT not only streamlines and secures the daily charging routine , but it also paves the way for a new paradigm in power management . This tutorial will commence with an overview of the fundamental aspects of wireless power transfer systems , highlighting the advantages and trade-offs associated with different solutions . It will delve into a comprehensive examination of two fundamental near-field coupling methods: magnetic field coupling and electrical field coupling , offering a unified perspective . This presentation aims to convey the core concepts starting from a foundational level , encompassing the coupler structure , coupler model , compensation networks and their design objectives , inverters and rectifiers , modulation , hybrid compensation , converter model , and dynamic control . Additionally , a brief review of the current state-of-the-art and potential challenges in WPT will be provided .

Biography



Minfan Fu received the B .S . , M .S . , and Ph .D . degrees in electrical and computer engineering from University of Michigan-Shanghai JiaoTong University Joint Institute , Shanghai Jiao Tong University , Shanghai , China in 2010 , 2013 , and 2016 . He is currently a tenured Associate Professor at School of Information Science and Technology (SIST) , ShanghaiTech University , Shanghai , China . His research interests include wireless power

transfer , ultra-high-frequency power conversion , applications of wide-band-gap devices , magnetic integration , modeling and control of resonant convertors , and ubiquitous power IoT . He is a senior member of IEEE , CPSS , and CES . He holds 16 patents and has published over 60 papers in prestigious IEEE journals . Currently , his total google scholar citations exceeds 2600 . He serves as the track or section chair of international conferences for 18 times , and have given 8 tutorials in various conf . He was included on an Elsevier list of the top 2% of scientists in their fields for either single-year impact since 2019 .



Yun Yang received the Ph .D . degree in Electrical Engineering from The University of Hong Kong in 2017 . He was a Research Assistant Professor in the Department of Electrical Engineering , the Hong Kong Polytechnic University from 2020 to 2022 , and an Honorary Research Assistant Professor in the Department of Electrical and Electronic Engineering , the University of Hong Kong . He is currently an Assistant Professor in the School of Electrical and

Electronic Engineering , Nanyang Technological University . He served as Associate Editors of several journals in Electrical Engineering and Technical Committee Members and Session Chairs of several conferences . His research interests include wireless power transfer , power electronics , microgrids , and advanced control .



Yong Li received the B .Sc . and Ph .D . degrees from the School of Electrical Engineering , Southwest Jiaotong University , Chengdu , China , in 2013 and 2017 , respectively . From 2017 to 2018 , he was a Research Associate at the Department of Electrical Engineering , The Hong Kong Polytechnic University , and subsequently , he was a Post-Doctoral Fellow with the same department . He is currently an Associate Professor with Southwest Jiaotong

University, Chengdu, China. His main research interests are wireless power transfer and energy harvesting. He is a senior member of IEEE. He holds 20 Chinese patents and has published over 60 papers in prestigious IEEE journals. Currently, his total Google Scholar citations exceeds 2100. He is included on a Stanford University list of the top 2% of scientists in their fields for either single-year impact in 2019-2022.

**Tutorial 8:
Design and Control of Solid-State DC Transformers for DC Transmission and Distribution Grids**

Date & Time: May 17, 13:30~15:30

Location: Meeting Room 6 (宽巷厅)

Lecturers: Rik W. De Doncker, Jingxin Hu, Shenghui Cui, Subhashish Bhattacharya

Abstract

The transition from a predominantly fossil fuel-based power generation towards renewable power sources, predominantly wind turbines and photovoltaic systems, inevitably leads towards an energy supply system that greatly depends on power electronics to feed the energy in the electrical grid. As all power electronic driven systems are intrinsically DC sources or loads, DC transmission and distribution systems become evident, not only because it is more efficient and cost effective, but also increases the ampacity of cables. The development and commercialization of medium-voltage, multi-megawatt DC-DC converters, also called solid-state DC transformers, is a key enabler to realize flexible and interconnected DC grids. Compared to AC transformers, solid-state DC transformers not only need to transform voltage and control power flow, but also need to offer similar efficiencies (up to 99%) at high switching frequencies, provide the same insulation levels and limit fault currents, that is, offer fault-ride-through capabilities. In this tutorial, we introduce and describe the latest advances and best practices of galvanically isolated bidirectional DC-DC converters for solid-state DC transformers. It covers a wide selection of key enabling technologies from converter topologies, optimized control, to the design of highly efficient megawatt medium-voltage DC-DC converters based on emerging MV SiC devices.

Biography



Rik W. De Doncker (F'01) received the Ph.D. degree in electrical engineering from the Katholieke Universiteit Leuven, Leuven, Belgium, in 1986. In 1987, he was appointed as a Visiting Associate Professor at the University of Wisconsin, Madison. After a short stay as an Adjunct Researcher with Interuniversity Microelectronics Centre, Leuven, he joined, in 1989, the Corporate Research and

Development Center, General Electric Company, Schenectady, NY. In 1994, he joined Silicon Power Corporation, a former division of General Electric Inc., as the Vice President of Technology. In 1996, he became a Professor at RWTH Aachen University, Aachen, Germany, where he currently leads the Institute for Power Electronics and Electrical Drives. Since 2006, he has been the Director of the E.ON Energy Research Center, RWTH Aachen University. Dr. De Doncker was the President of the IEEE Power Electronics Society (PELS) in 2005 and 2006. He was the recipient of the IEEE IAS Outstanding Achievement Award in 2002, the IEEE PES Nari Hingorani Custom Power Award in 2008, the IEEE William E. Newell Power Electronics Award in 2013, and the IEEE Medal in Power Engineering in 2020.



Jingxin Hu (M'19) received the Dr.-Ing. degree (summa cum laude) in electrical engineering from RWTH Aachen University, Aachen, Germany in 2019. He was with ABB Corporate Research Center (Switzerland) in 2012 and General Electric Global Research Center (Germany) from 2013 to 2014. From 2014 to 2022, he was a Senior Scientist and Research Associate with E.ON Energy Research Center, RWTH Aachen. Since 2022, he has become a

full professor at Nanjing University of Aeronautics and Astronautics, China. His main research interests include high-power converters, intelligent energy routers, renewable power generation and energy storage, as well as dc transmission and distribution. 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.



Shenghui Cui (M'19) received the Dr.-Ing. degree in electrical engineering with the highest distinction (summa cum laude) from RWTH Aachen University, Aachen, Germany, in 2019. Since September 2021, Dr. Cui is with Department of Electrical and Computer Engineering, Seoul National University, Seoul, South Korea as an assistant professor. His research interests include interaction of power systems and power converters, power

converters in ac/dc utility applications, and applications of wide-band gap power devices. Dr. Cui was the recipient of the STAWAG Best Dissertation Prize from Faculty of Electrical Engineering and Information Technology, RWTH Aachen University in 2019, the Second Place Prize Paper Award of the IEEE Transactions on Power Electronics in 2018.



Subhashish Bhattacharya (F'22) received his Ph.D. from the University of Wisconsin-Madison, all in electrical engineering. He worked in the FACTS and Power Quality group at Westinghouse, which later became part of Siemens Power, from 1998 to 2005. He joined the Department of ECE at NCSU in August 2005, where he is Duke Energy Distinguished Professor and a founding faculty member of NSF ERC FREEDM Systems Center, Advanced Transportation Energy Center [ATEC] and the US DOE initiative on WBG based Manufacturing Innovation Institute - PowerAmerica - at NCSU. His research interests are Solid-State Transformers, MV power converters enabled by HV SiC devices, FACTS, and application of new power semiconductor devices such as SiC and GaN for converter topologies.

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**Tutorial 9:
Fault Diagnosis and Tolerant Control of AC Motor Drives**

Date & Time: May 17, 16:00~18:00

Location: Meeting Room 10 (文翁厅)

Lecturers: Zheng Wang, Jiangbiao He, Xueqing Wang

Abstract

Nowadays, AC motor drives have been intensively used in more and more emerging applications. Especially, the rapid development of transportation electrification promotes the further development of AC motor drives to a new level. Reliability has become a key technical index of the new-generation AC motor drives for safety-critical applications. Power electronic devices and winding insulation are two vulnerable components in AC motor-drive systems due to aging, overloading, and abnormal operations. If the faults that occurred in the AC motor drives are intervened timely, they may result in catastrophic damages to the overall system through fault propagation. Fault diagnosis, and fault-tolerant control play important roles to improve the reliability of AC motor drives. Fault diagnosis technique functions to locate the fault accurately and rapidly by extracting fault features from sensors. Fault-tolerant control techniques enable the continuous operation of AC motor drives after occurrence of faults. This tutorial will present the techniques of fault diagnosis and fault-tolerant control of AC motor drives, including the standard AC motor drives, multilevel AC motor drives, and multiphase AC motor drives.



Biography



Zheng Wang received the Ph.D. degree from The University of Hong Kong, Hong Kong, in 2008. From 2008 to 2009, he was a Postdoctoral Fellow in Ryerson University, Toronto, ON, Canada. He is currently a full Professor in the School of Electrical Engineering, Southeast University, China. His research interests include electric drives, power electronics, and renewable power generation. Prof. Wang received IEEE PES Chapter Outstanding Engineer Award and Outstanding Young Scholar Award of Jiangsu Natural Science Foundation of China. He is serving as the Asia Liaison of Transportation System Committee for IEEE IAS, the Vice Chairman of Technical Committee of Renewable Energy System for IEEE IES, and an associate editor of IEEE Transactions on Industrial Electronics and IEEE Transactions on Industry Applications. He is an IET Fellow and an IEEE VTS Distinguished Lecturer.

Award and Outstanding Young Scholar Award of Jiangsu Natural Science Foundation of China. He is serving as the Asia Liaison of Transportation System Committee for IEEE IAS, the Vice Chairman of Technical Committee of Renewable Energy System for IEEE IES, and an associate editor of IEEE Transactions on Industrial Electronics and IEEE Transactions on Industry Applications. He is an IET Fellow and an IEEE VTS Distinguished Lecturer.



Jiangbiao He is an Associate Professor and the endowed Pigman Faculty Fellow in the Department of Electrical and Computer Engineering at the University of Kentucky (UK), USA. Previously, he worked in multiple large industry R&D centers, most recently as a Lead Engineer at GE Global Research in New York. He obtained his Ph.D. in Electrical Engineering from Marquette University, USA. Dr. He's research interests include high-performance power electronics and motor-drive systems, as well as their health monitoring and fault-tolerant design, targeting at transportation electrifications and utility grid applications. Dr. He has served as an Associate Editor for multiple prestigious journals. Dr. He is the recipient of the 2018 Whitney Technical Excellence Award at GE-GRC, 2019 AWS Outstanding Young Member Achievement Award from IEEE Industry Applications Society, and 2023 Faculty Excellence in Research Award from University of Kentucky.

performance power electronics and motor-drive systems, as well as their health monitoring and fault-tolerant design, targeting at transportation electrifications and utility grid applications. Dr. He has served as an Associate Editor for multiple prestigious journals. Dr. He is the recipient of the 2018 Whitney Technical Excellence Award at GE-GRC, 2019 AWS Outstanding Young Member Achievement Award from IEEE Industry Applications Society, and 2023 Faculty Excellence in Research Award from University of Kentucky.



Xueqing Wang is the Associate Professor of College of Electrical Engineering at Sichuan University. He was selected for the Talents Program of Sichuan University in 2021. Dr. Wang is the Distinguished Reviewer of IEEE Transactions on Industrial Electronics in 2023 and recipients of the 2021 IEEE TEC Prize Ph.D. Thesis Talk (Top3) and the Excellent Doctoral Dissertations of Jiangsu Province in 2021. He has been authored or coauthored



more than 80 academic papers and 12 patents . His research interests include control of multiphase motor and open-winding motor , fault diagnosis and tolerant control of motor drive , multilevel PWM strategy .

**Tutorial 10:
Power Electronics as the Enabling Technology for Buildings Decarbonization**

Date & Time: May 17, 16:00~18:00

Location: Meeting Room 11 (石室厅)

Lecturers: Dmitri Vinnikov, Andrii Chub, Andrei Blinov

Abstract

As the world combats climate change , the decarbonization of buildings stands out as a pivotal goal . Buildings significantly contribute to greenhouse gas emissions , largely due to their energy consumption . Nowadays , energy performance labels are assigned to existing and newly commissioned buildings . Moreover , some countries forbade commissioning new buildings with labels below "A ." Achieving sustainability in the built environment necessitates innovative solutions that can dramatically reduce carbon footprints . The existing technologies based on AC distribution have reached maturity , and new approaches are required to enhance the energy efficiency of buildings further . The combination of power electronics and DC microgrids has emerged as a transformative technology in this endeavor . To accelerate the transition to decarbonized buildings , it is essential to foster innovation , invest in research and development , and promote policies that encourage the adoption of power electronics and DC microgrid solutions . They can further optimize energy usage , integrate renewable energy sources , and create highly efficient and sustainable building ecosystems . DC buildings feature enhanced resilience , for example , in the face of grid failures or disasters . DC microgrids with power electronics can operate autonomously , providing critical power to essential systems like lighting , communication , and HVAC , independently from the AC-grid . This makes power electronics and DC microgrids indispensable tools for building stock decarbonization . Their combined use not only reduces carbon emissions but also improves energy sustainability and grid independence of buildings .



Biography



Dmitri Vinnikov (IEEE Fellow) received the Dipl . Eng . , M .Sc . , and Dr . Sc . techn . degrees in electrical engineering from Tallinn University of Technology , Tallinn , Estonia , in 1999 , 2001 , and 2005 , respectively . He is currently the Head of the Power Electronics Group , Department of Electrical Power Engineering and Mechatronics , Tallinn University of Technology (Estonia) . He was one of the co-founders and leading researchers of ZEBE - Esto-

nian Centre of Excellence for zero energy and resource efficient smart buildings and districts . His research interests include applied design of power electronic systems , implementation of wide-bandgap semiconductors , energy-efficient buildings , reliability and fault-tolerance of power electronic converters . D . Vinnikov is a full member of the Estonian Academy of Sciences and a Chair of the IEEE Estonia Section .



Andrii Chub (Senior Member , IEEE) received the Ph .D . degree in electrical engineering from the Tallinn University of Technology , Tallinn , Estonia , in 2016 . He was a Visiting Research Fellow with Kiel University in 2017 and a Postdoctoral Researcher with Federico Santa Maria Technical University from 2018 to 2019 . He is currently a Senior Researcher with the Power Electronics Group , Department of Electrical Power Engineering and Mecha-

tronics , Tallinn University of Technology . His research interests include advanced dc-dc converter topologies , energy-efficient buildings , reliability , and fault-tolerance of power electronic converters . Dr . Chub is the Chair of the Joint IES/PELS/IAS/PES chapter of the IEEE Estonia Section and an Associate Editor for the IEEE Journal of Emerging and Selected Topics in Industrial Electronics .



Andrei Blinov (Senior Member , IEEE) received the M .Sc . degree in electrical drives and power electronics and the Ph .D . degree , with a dissertation devoted to the research of switching properties and performance improvement methods of high-voltage IGBT-based dc-dc converters , from Tallinn University of Technology , Tallinn , Estonia , in 2008 , and 2012 , respectively . After the Ph .D . studies , he has spent two years in Sweden working as

a Postdoctoral Researcher with the KTH Royal Institute of Technology . He is currently a Senior Researcher with the Department of Electrical Power Engineering and Mechatronics , Tallinn University of Technology . The research interests are in switch-mode power converters , new semiconductor technologies , renewable energy , and battery storage systems .

Tutorial 11: Artificial Intelligence-assisted Applications in Power Electronics

Date & Time: May 17, 16:00~18:00

Location: Meeting Room 1 (琴台厅)

Lecturers: Shuai Zhao, Yi Zhang, Huai Wang

Abstract

Artificial intelligence (AI) has been integrated into power electronic systems (PES) since the 1990s , primarily for purposes such as design , intelligent control , diagnostics , and prognostics . Nevertheless , the initial promise of competitive AI-driven solutions has not materialized , and their adoption within the industrial sector has remained limited . Presently , this landscape has undergone a substantial transformation , with the recognition that cutting-edge AI tools hold the potential to confer significant advantages on power electronics . This shift is particularly relevant as PES increasingly evolve into data-intensive systems . The primary objective of this tutorial is to offer a systematic overview of the latest advancements in AI-assisted applications for power electronics . Situated at the intersection of data science and power electronics , this tutorial will start with a structured introduction to AI-assisted data-driven applications for PES . The subsequent part will present several representative case studies , including thermal modeling for temperature prediction , condition monitoring through digital twin technology , parameter estimation utilizing physics-informed machine learning , remaining useful life prediction through information fusion techniques , etc . In conclusion , this tutorial will conclude with a discussion of ongoing initiatives , prospects for novel AI tools , prospects for edge implementation , open-source data/tools , and emerging opportunities within this dynamic and synergistic domain .

Biography



Shuai Zhao received B.S. , M.S. , and Ph.D. degrees in information and telecommunication engineering from Northwestern Polytechnical University , Xi'an , China , in 2011 , 2014 , and 2018 , respectively . He is currently an Assistant Professor with AAU Energy , Aalborg University , Denmark . From 2014 to 2016 , he was a Visiting Ph.D. student at the University of Toronto , Canada . In August 2018 , he was a Visiting Scholar with the

University of Texas at Dallas , USA . From 2018 to 2022 , he was a PostDoc researcher with AAU Energy , Aalborg University , Denmark . He is an Associate Editor of IEEE TRANSACTIONS ON VEHICLE TECHNOLOGY and Guest Editor of IEEE Journal of Emerging and Selected Topics in Industrial Electronics and Elsevier e-Prime Journal . His research interests include physics-informed machine learning , system informatics , condition monitoring , diagnostics & prognostics , and tailored AI tools for power electronic systems .



Yi Zhang received the Ph.D. degree in electrical engineering from Aalborg University , Denmark , in 2020 . He is currently an Assistant Professor with the AAU Energy , Aalborg University , Denmark . During 2020-2023 , he was affiliated with multiple institutions as a postdoctoral researcher with the support of the Danish Research Council for Independent Research , including RWTH-Aachen University , Germany , Swiss Federal Institute of

Technology Lausanne , Switzerland , and Massachusetts Institute of Technology , USA . His research focuses on reliability and thermal issues of power electronics , and their solutions based on optimization and machine learning . Dr . Zhang is the Guest Associate Editor of IEEE Transactions on Power Electronics . He is recipient of the First Place Prize Paper Award of the IEEE Transactions on Power Electronics in 2021 , and the IEEE Power Electronics Society Ph.D. Thesis Award in 2020 .



Huai Wang is currently Professor at the Department of Energy , Aalborg University , Denmark , where he leads the Reliability of Power Electronic Converters (ReliaPEC) group . He is also the Mission Leader of Digital Transformation and AI at AAU Energy , with 13 affiliated research groups . His research addresses the fundamental challenges and application issues in efficient , reliable , and cognitive power electronic converters . Dr . Wang



received his Ph.D. degree from the City University of Hong Kong. He was with the ABB Corporate Research Center, Switzerland, in 2009. Dr. Wang received the Richard M. Bass Outstanding Young Power Electronics Engineer Award from the IEEE Power Electronics Society in 2016. He serves as the Chair of IEEE IAS/IES/PELS Chapter in Denmark during 2018-2020 and the editorial board of four journals. He was elected as a member of the Danish Academy of Technical Sciences in 2023.

Tutorial 12: Multi-Cell & Multi-Level Power Converters -From Theory to Practice

Date & Time: May 17, 16:00~18:00

Location: Meeting Room 2 (故里厅)

Lecturers: Petar. J. Grbović, Thierry. A. Meynard, Zoran Miletić

Abstract

Power Electronics and Static Power Converters in general are today part of every segment of our life. Any piece of electric equipment we are using today is somehow based on power electronics and static power converters; home appliance, industrial equipment, renewable energy, IT, automotive, avionic, etc., etc. Conversion efficiency, specific power, power density and the converter cost are today the most critical requirements for new applications. One way to increase the efficiency and reduce cost/size/weight of the converter is to deploy new power semiconductor such as SiC and GaN power switches.

In the last decade, we have seen a dramatic progress, particularly in the field of power semiconductors and power converters topologies. Each new generation of power semiconductor introduces a new challenge and issue. Some of the issues such as extreme di/dt and du/dt in combination with the device and the package parasitic inductance and capacitance make almost impossible to fully utilize all advantages of the new WBG (SiC and GaN) power semiconductor devices. Some possible solutions to above mentioned issues, which have been under the spot for more than two decades are "New" topologies such as Multi-Level (Series Interleaved) and Multi-Cell (Parallel Interleaved) Converters.

After an introduction to fundamentals of Static Power Converters and Topologies, new WBG power semiconductors and associated di/dt and du/dt issues will be addressed and discussed in the 2nd and 3rd part of the tutorial. The 4th and 5th part of the tutorial will cover theory of Multi-Cell (Parallel Interleaved) and Multi-Level (Series Interleaved) topologies. The advantages, such as significant volume reduction of the converter input and output LC filter and the DC BUS capacitor will be extensively discussed. Moreover, strong



impact on the device switching performances including switching losses and the switch over-voltage stress will be addressed too. Series & Parallel Multi-Level Converters will be addressed in the 6th part of the tutorial. Finally, in the concluding part of the tutorial, design guidelines will be addressed. Several design cases will be presented and intensively discussed too.

This tutorial is aimed at power electronics engineers, professionals and undergraduate as well as graduate students who want to improve their knowledge and understanding of Multi-Cell & Multi-Level power converters and their application.

Biography



Petar J. Grbović received the Doctor (Ph.D) degree from the Laboratoire 'Électrotechnique et d'Électronique de Puissance de Lille, l'Ecole Centrale de Lille, France in 2010. From March 1999 to February 2003, he was an R/D Engineer with RDA Co, Belgrade. From March 2003 to April 2005, he was with the R&D Department, PDL Electronics, Ltd., Napier, New Zealand. Since April 2005 until July 2010, he was working with Schneider Toshiba

Inverter Europe, Pacy-Sur-Eure, France, as Power Electronics Group Expert. In June 2018 he was appointed to position of Full Professor at Innsbruck Power Electronics Laboratory (i-PEL), the University of Innsbruck, Austria. The focus of his research is on application of advanced energy storage devices, active gate driving for high power Si IGBTs and SiC MOS-FETs, power converter topologies and control of power converters and semiconductor switches.



Thierry A. Meynard graduated from the Ecole Nationale Supérieure d'Electrotechnique, d'Electronique, d'Hydraulique de Toulouse in 1985, became a Doctor of the Institut National Polytechnique de Toulouse, France, in 1988 and was then an invited researcher at the Université du Québec à Trois Rivières, Canada, in 1989. He joined the CNRS (Centre National de la Recherche Scientifique) as a full-time researcher in 1990, was Head of the

Static Converter Group from 1994 to 2001. He is now Directeur de Recherches CNRS. In 2016 he co-founded and became scientific advisor at the company Power Design Technologies that develops PowerForge, the software for design of 2- and multi-level power converters later acquired by Gamma Technologies. His main research interests are related to series and parallel multicell converters, magnetic components and the development of design tools for power electronics.



Zoran Miletic received his MSc degree in Electrical Engineering from the University of Belgrade , Faculty of Electrical Engineering , Serbia in 1996 and the Professional Certificate in Power Electronics from the University of Colorado at Boulder , Department of Electrical and Computer Engineering , USA in 2008 . For more than two decades he has led product development of power electronic converters for renewable energy applications at Xantrex Technology Inc . in Vancouver , Canada and Schneider Electric Solar in

Europe and Canada . Since 2014 he is employed at AIT , Austrian Institute of Technology , as a Senior Research Engineer . At AIT , his research interests focus is on grid connected and grid forming converters and their control for emerging smart grid applications . He is a senior member of IEEE .

**Tutorial 13:
Computer-aided Accurate Modeling and Design Optimization for
Isolated Resonant DC-DC Converters**

Date & Time: May 17, 16:00~18:00

Location: Meeting Room 3 (鼓楼厅)

Lecturers: Yuqi Wei, Quanming Luo, Jinjun Liu

Abstract

Traditionally , the fundamental harmonic analysis (FHA) method is utilized to analyze and model resonant converters . However , massive harmonics exist when a wide voltage gain range operation is required . To address this issue , based on accurate time-domain model and with the aid of computer mathematical software (like MATLAB) , both steady-state and dynamic circuit waveforms of these power converters can be accurately derived . In addition , small signal model is very challenging but important for resonant converters . Conventionally , the extended describe function is adopted to derive the small signal model , where only the fundamental harmonics are considered , which leads to low accuracy and unoptimized design . With the aid of resonant converters accurate dynamic circuit models , the small signal models for resonant converters under various operation modes can be simply derived and used to guide the controller design and stability analysis . Conventional power converter design is mostly based on engineering experience and simplified FHA circuit model . In addition , the commercial simulation software is involved and massive simulations have been executed to find out the final design candidate . Clearly , conventional power converter design method is both inaccurate and time-consuming . With the aid of accurate time-domain circuit model and advanced optimization algo-

rithms , comprehensive and optimal design methods for these advanced resonant DC-DC converters are discussed .

Biography



Yuqi Wei (IEEE Member): Dr . Wei received his Ph .D . degree from the University of Arkansas , Fayetteville , AR , USA , May 2022 . From April 2022 , he worked as post-doc at University of Arkansas . Since 2023 , he is working as Associate Professor at Xi'an Jiaotong University . His research interest includes the design optimization of advanced isolated power converters . He has published 20 high quality peer-reviewed journal papers in

this field . He received the 2020 IEEE Power Electronics Society Transactions Second Place Prize Paper Award as First and Corresponding author . He received the 5th IEEE International Future Energy Electronics Conference (IFEEC 2021) best paper award . He received the IEEE TEC Prize Ph .D . Thesis Talk Award . Six best presentation awards for international conferences (APEC , ITEC-Asia , PEAC , and CIYCEE) .



Quanming Luo(Member , IEEE) was born in Chongqing , China , in 1976 . He received the B .S . , M .S . , and Ph .D . degrees in electrical engineering from Chongqing University , Chongqing , China , in 1999 , 2002 , and 2008 , respectively . Since 2005 , he has been with the College of Electrical Engineering , Chongqing University , where he is currently a Professor . He is the author or coauthor of more than 40 papers in journal or conference

proceedings . His current research interests include LED driving systems , communication power systems , power harmonic suppression , and power conversion systems in electrical vehicles . Dr . Luo delivered for many times plenary keynote speeches at China national conferences .



Jinjun Liu (IEEE Fellow) 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 is currently a XJTU Distinguished Professor of Power Electronics . Dr . Liu received for many times governmental awards at national level or provincial/ministerial level for scientific research/teaching achievements . He also received 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 .

**Tutorial 14:
Power Quality and Operability of Distributed Power Generation Systems: Advanced and Intelligent Control**

Date & Time: May 17, 16:00~18:00

Location: Meeting Room 5 (南街厅)

Lecturers: Yongheng Yang, Chi-Seng Lam, Nick Papanikolaou

Abstract

Power electronics is the key technology on the way towards cleaner and sustainable energy generation , distribution and use . Their applications are expanded to all forms of electric energy systems , i . e . , ac - dc - hybrid , grid-tied , multi-connected or standalone , urban or rural , residential or industrial / commercial , (distributed) generation systems . Thanks to the fast-growing power electronics and intelligent control technologies that they incorporate , distributed power generation systems (DPGS) have a catalytic role in the increase of renewable energy share in the Energy Sector . As such , the impressive growth of distributed generation installations , the fast electrification of all transportation means , the evolution of Smart Grid concept and the transformation of the Building Stock into Zero Energy Buildings , are tangible results of the advances . However , modern DPGS also encounters many technical challenges , where maintaining uninterrupted , high power quality supply and smart management services to their users is of importance and complying with the relevant international standards (IEEE Stds 1547-1018 , 2030 .7-2017 , 2030 .10-2021 etc .) is of concern . Thus , more advanced , and intelligent control loops are required to meet those operational needs . In this context , advanced power electronics solutions , including Artificial Intelligence (AI) , are gaining a lot of interest in the power electronics based DPGS . To this end , the power electronic units become more autonomous in making important decisions even in near real-time scale in the DPGS . Hence , they are transformed into powerful tools in the service of the modern DPGS .

With this in mind , the tutorial is proposed for intermediate and advanced audiences , and it is dedicated to tackling the technological challenges of the wide-scale adoption of power electronics-based distributed generation systems . It provides a step-by-step design of the

key - power electronics for DPGS considering the stringent standards . The focus is to innovate and improve the power quality and operability by means of advanced control to create more sustainable , grid-friendly , efficient , and reliable DPGS that comply with grid regulations and contribute to reducing the cost of energy , as well as secure and reliable grid operation . The tutorial is intended for intermediate and advanced audiences in the field of power electronics , engineers and researchers , who are looking for advanced solutions to the modern DPGS . Researchers and engineers who seek basic knowledge for power electronics technology and system integration are also welcomed . Prerequisite is basic power electronics and control .

Biography



Yongheng Yang (Senior Member , IEEE) received the Ph .D . degree from Aalborg University , Denmark , in 2014 . From 2014 to 2020 , he was with the Department of Energy Technology , Aalborg University , where he achieved the rank of tenured Associate Professor in 2018 . In 2021 , he joined Zhejiang University , Hangzhou , China , as a ZJU100 Professor . He became a Zhejiang Kungpeng Investigator in 2023 . Prof . Yang served as the Chair of

the IEEE Denmark Section in 2019-2020 . He was the recipient of the 2021 IEEE Richard M . Bass Outstanding Young Power Electronics Engineer Award from the IEEE Power Electronics Society and the 2022 IEEE Isao Takahashi Power Electronics Award . He was included on the list of the Highly Cited Chinese Researchers by Elsevier in 2022-2023 . He is currently a Vice Chair of the IEEE PELS Technical Committee on Sustainable Energy Systems and a Council Member of the China Power Supply Society .



Chi-Seng Lam (Senior Member , IEEE) received the Ph .D . degree in electrical and electronics engineering from the University of Macau (UM) , Macao , China , in 2012 . He completed the Clare Hall Study Programme at the University of Cambridge , Cambridge , U .K . , in 2019 . In 2013 , he was a Postdoctoral Fellow with The Hong Kong Polytechnic University , Hong Kong , China . He is currently an Associate Professor with the State Key Laboratory of Analog and Mixed-Signal VLSI and the Institute of Microelectronics , UM , and also with the Department of Electrical and Computer Engineering , Faculty of Science and Technology , UM . His research interests include power quality compensators , renewable energy generation , power management integrated circuits , and wireless power transfer .



Nick Papanikolaou (Senior Member, IEEE) received the Dipl. Eng. and Ph.D. degrees in electrical & computer engineering from the University of Patras, Patras, Greece, in 1998 and 2002, respectively. Prior to his Academic Career, he worked in the Hellenic Transmission System Operator, as well as in the Electric Transportation Company of Athens. In 2013, he joined the Democritus University of Thrace (DUTH), Xanthi, Greece, where he is

currently a Professor at the Electrical & Computer Engineering Department (ECE-DUTH) in the field of Power Electronics and their applications to renewable energy, distributed generation, electric transportations, and power quality improvement. He is a Senior Member, IEEE, and he is included in the Stanford list of top 2% scientists (Electrical & Electronic Engineering field). He also serves as the Vice President and the Director of the MSc & PhD Programs of the ECE-DUTH department.

Tutorial 15: Graph Theory-based Methods for Power Converters and Systems

Date & Time: May 17, 16:00~18:00

Location: Meeting Room 7 (窄巷厅)

Lecturers: Yunwei (Ryan) Li, Yuzhuo Li

Abstract

The integration of power electronics into the modern electrical grid signifies a cornerstone in the ongoing energy transition, facilitating unprecedented advancements in the management and efficiency of energy systems. As the complexity and variety of power converter systems expand, there arises a pressing need for a systematic framework to navigate these advancements. This tutorial addresses this gap by leveraging graph theory to elucidate the intricate relationships among various power converter topologies and systems. Beginning with a comprehensive overview of the power electronics-enabled electrical grid, this tutorial introduces the foundational principles of graph theory and their evolution in the context of power converters and systems. Key concepts such as duality and isomorphism are explored to establish universal topology guidelines, with a special emphasis on voltage-/current-source converters and multiport converters. This includes various recently proposed converter topologies and operations by our group. Additionally, the tutorial delves into graph-based methodologies for deriving topologies and operational strategies for multilevel converters and addressing system-level challenges, such as optimizing electric vehicle (EV) charging networks.



Biography



Yunwei (Ryan) Li is a professor, University of Alberta Senior Engineering Research Chair, and Interim Chair of the Department of Electrical and Computer Engineering. He received the Ph.D. degree from Nanyang Technological University, Singapore, in 2006. In 2005, Dr. Li was a Visiting Scholar with Aalborg University, Denmark. From 2006 to 2007, he was a Postdoctoral Research Fellow at the Toronto Metropolitan University, Canada. In 2007,

he also worked at Rockwell Automation Canada before he joined University of Alberta, Canada in the same year. His research interests include distributed generation, microgrid, renewable energy, high power converters and electric motor drives. Dr. Li is the Vice President for Products of IEEE Power Electronics Society (PELS) 2022-2024. He was the Editor-in-Chief for IEEE Transactions on Power Electronics Letters 2019-2023. Prior to that, he was Associate Editor for IEEE Transactions on Power Electronics, IEEE Transactions on Industrial Electronics, IEEE Transactions on Smart Grid, and IEEE Journal of Emerging and Selected Topics in Power Electronics. Dr. Li served as the general chair of IEEE Energy Conversion Congress of Exposition (ECCE) in 2020, and AdCom Member at Large for PELS 2021-2023. Dr. Li received the Nagamori Foundation Award in 2022 and the Richard M. Bass Outstanding Young Power Electronics Engineer Award from IEEE PELS in 2013. He is recognized as a Highly Cited Researcher by the Clarivate Analytics.



Yuzhuo Li is currently a Postdoctoral Fellow with the University of Alberta. He received the B.S. and M.S. degrees in control science and engineering from Shandong University, Jinan, China, in 2012 and 2015, respectively, and the Ph.D. degree in energy system from the University of Alberta, Edmonton, Canada, in 2021. His main research interests include intelligent and graph-based systematic power electronics design.



**Tutorial 16:
Reliability Challenges and Potential Solutions in Wide-bandgap Device based Motor Drives**

Date & Time: May 17, 16:00~18:00

Location: Meeting Room 6 (宽客厅)

Lecturers: Xibo Yuan, Wenzhi Zhou, Mohamed Diab

Abstract

The fast-switching speed , higher voltage and higher temperature capabilities of wide-bandgap (WBG) power devices such as SiC and GaN devices have brought in clear opportunities in achieving high-density , higher-efficiency , higher-frequency and highly-integrated motor drives . However , high dv/dt and high switching frequency can cause increased level of motor over-voltage , insulation and bearing degradation and electro-magnetic interference . Under the high dv/dt of WBG motor drives , motor terminals and stator winding neutral will see clear over-voltage with much shorter cables than that under Si IGBT motor drives and the voltage stress will mostly drop on the first several turns of the motor windings close to the terminal or neutral . How the switching speed and switching frequency will affect the winding insulation (e .g . , through partial discharge) and motor bearing (e .g . , through motor bearing current) will be explained . Experimental test results with SiC/GaN motor drives will be given and the theory behind the experimental observations will be provided with the analysis in both the time and frequency domain . Several potential solutions in addressing the reliability concerns of high-frequency WBG drives will be given , including passive and active filters , waveform shaping through soft-switching and device gate drive , alterative converter topologies , quasi-multilevel modulation , etc . SiC/GaN motor drive examples will be presented to further demonstrate the challenges and potential solutions mentioned above .

Biography



Xibo Yuan obtained his PhD degree from Tsinghua University and is a Professor at the China University of Mining and Technology , China . His research interests include power electronics and motor drives , wind power generation , multilevel converters , application of wide-bandgap devices and more electric aircraft technologies . He has led several research projects in the field of wide-bandgap motor drives and their reliability . He is a Distin-



guished Lecturer of the IEEE Power Electronics Society and received several prize paper awards from IEEE journals and conferences .



Wenzhi Zhou received the B .S . degree from Dalian Jiaotong University , Dalian , China , the M .Sc . degree from Zhejiang University , Hangzhou , China , and the Ph .D . degree from the University of Bristol , Bristol , UK , in 2013 , 2016 , and 2022 , respectively , all in electrical engineering . He has been a Research Associate since 2022 with the Electrical Energy Management Group (EEMG) , School of Electrical , Electronic and Mechanical Engineering , University of Bristol . His research interests include wide-bandgap device applications , soft-switching , partial discharge and motor drives .



Mohamed Diab is a Lecturer in Power Electronics at the Wolfson School of Mechanical , Electrical and Manufacturing Engineering , Loughborough University , UK and works at the Centre for Renewable Energy Systems Technology (CREST) . He has several years of experience in academic and industrial research in electrical power engineering . His research focuses on power electronics applications , energy conversion , and electrical machine drives . Prior to his current position at Loughborough University , he has been with University of Bristol as a Research Associate for around 3 years and with Spiretronic as a Research Engineer for more than 3 years . He was a Visiting Researcher at Institute for Drive Systems and Power Electronics in Leibniz Universität Hannover and an Assistant Lecturer at Alexandria University and Glasgow Caledonian University .



Theme >>> **Talk with Peers: Early Career Development**

Chairs >>> **Pinjia Zhang**, Tsinghua University, China
Wensheng Song, Southwest Jiaotong University, China

Date & Time >>> May 18, 19:00-21:00

Location >>> Breeze Terrace & Sky Bar (微风露台&酒吧 17 F)

Sponsor
IEEE Power Electronics Society (PELS)

Host
Southwest Jiaotong University

Co-sponsor
China Electrotechnical Society Young Scholar Committee

The **IPEMC 2024 Young Professionals Networking Reception** is an opportunity to network with both other young professionals as well as highly-experienced professionals from both industry and academia. In this casual setting, YPs will have the opportunity to build connections with their peers, while chatting with and getting valuable career advice from established and well-regarded power electronics professionals, all with the added bonus of enjoying drinks and food provided included with attendance.

NOTE: This reception has a hard limit on headcount of 100 people, so participants who have registered online in advance are accepted.

Theme >>> **Unlock Your Potential: Journey to Self-Improvement**

Chair >>> **Hong Li**, Beijing Jiaotong University, China

Vice Chair >>> **Han Cui**, Tianjin University, China
Ping Yang, Southwest Jiaotong University, China

Date & Time >>> May 19, 14:00-17:00

Location >>> Meeting Room 10+11 文翁石室厅

Sponsor
IEEE Power Electronics Society (PELS)

Host
Southwest Jiaotong University

Co-sponsor
China Electrotechnical Society Young Scholar Committee
WiE, IEEE PELS Membership Committee-China
China Women's Association for Science and Technology

This ECCE-Asia WiE Event is sponsored by the **IEEE Power Electronics Society (PELS)**. PELS is the most influential organization in the area of power electronics, with more than 15000 members worldwide. IEEE PELS China Membership Committee aims to promote the scientific and technological advancement as well as talent cultivation in the field of power electronics in China.

ECCE-Asia is one of the most important conferences that brings together professionals from all over the world to share their expertise, expand their professional networks, and stay updated on the latest advancements in power electronics. IPEMC 2024-ECCE Asia will be held from 17 to 20 May 2024.

This ECCE-Asia WiE Event tends to take the discussion on the unlimited potential of women, particularly in terms of professional growth and personal advancement, as well as ways to navigate through challenges and expand horizons in their academic and social life. This event features four invited speakers from around the globe, each sharing their inspiring stories and experiences. Following their presentations, there will be a roundtable discussion with 16 mentors delving into eight popular discussion topics. We sincerely invite you to join us, and the specific agenda is provided as follows.

NOTE: 100 exquisite gifts will be given on site on a first-come, first-served basis; no dress code required for the event, but wearing traditional Chinese clothing is strongly encouraged.

Schedule of the Event

Opening Ceremony Moderator: Hong Li	
Beijing Time	General Chairs
14:00-14:10	Frede Blaabjerg Xiaoqiong He
Keynote Speech Moderators: Ping Yang, Mingyao Ma	
Beijing Time	Speakers
14:10-14:30	Brad Lehman
14:30-14:50	Xuhui Wen
14:50-15:10	Shu Yang
15:10-15:30	Lin Fu
15:30-15:40	Break
Mentor Roundtable Moderator: Han Cui	
Beijing Time	Roundtable Discussion Topics
15:40-16:30	让PELS助力职业生涯 Growing Your Career Through PELS Brad Lehman, Han Cui
	扩大科研影响力 Steering Research Toward Impact Jian Sun, Xuhui Wen
	培育包容性文化 Fostering a Culture of Inclusiveness Frede Blaabjerg, Hong Li
	IEEE会员晋升要求 IEEE Membership Elevation Process Dehong Xu, Kai Sun
	建立自信心与行动力 Building Confidence and Assertiveness Xiaoyun Feng, Yu Sun
	创新与领导力 Innovation and Leadership Jinjun Liu, Xiaoqiong He
	电力电子新兴技术 Emerging Technologies in Power Electronics Yunwei (Ryan) Li, Pinjia Zhang
电力电子全球教育 Global Education in Power Electronics Katherine Kim, Mingyao Ma	
Open Mic Session (Beijing Time: 16:30-17:00)	

SPECIAL GUESTS



Frede Blaabjerg

Professor at Aalborg University.
IEEE Fellow,
General Chair of ECCE Asia 2024.

Xiaoqiong He

Professor at Southwest Jiaotong University.
General Chair of ECCE Asia 2024.



INVITED SPEAKERS



Brad Lehman

Professor at Northeastern University.
IEEE Fellow.

Xuhui Wen

Professor at Chinese Academy of Sciences.
Chairman of Electric Vehicle Committee of CES.



Shu Yang

Professor at University of Science and Technology of China.

Lin Fu

Professor at Tongji University.
UK Chartered Scientist.



MENTORS



Frede Blaabjerg
Professor at Aalborg University, IEEE Fellow.



Brad Lehman
Professor at Northeastern University, IEEE Fellow.



Mark Dehong Xu
Professor at Zhejiang University, IEEE Fellow.



Jinjun Liu
Professor at Xi'an Jiaotong University, IEEE Fellow.



Xiaoyun Feng
Professor at Southwest Jiaotong University.



Xuhui Wen
Professor at Chinese Academy of Sciences.



Jian Sun
Professor at Rensselaer Polytechnic Institute.



Yunwei (Ryan) Li
Professor at University of Alberta, IEEE Fellow.



Hong Li
Professor at Beijing Jiaotong University.



Xiaoqiong He
Professor at Southwest Jiaotong University.



Kai Sun
Tenured Associate Professor at Tsinghua University, IEEE Fellow.



Katherine A. Kim
Associate Professor at National Taiwan University.



Pinjia Zhang
Professor at Tsinghua University.



Yu Sun
Director of Academic Department of China Electrotechnical Society.



Mingyao Ma
Professor at Hefei University of Technology.



Han Cui
Professor at Tianjin University.

Special Session on IEEE Standards and Roadmaps

Theme >>> **How to Develop IEEE Standards and Roadmaps?**

Chair >>> **Liuchen Chang**, University of New Brunswick, Canada

Date & Time >>> May 19, 13:30-17:00

Location >>> Meeting Room 1 琴台厅

Description of the Session

Standards are published documents that establish technical specifications and procedures designed to maximize the reliability of the materials, products, methods, and/or services people use every day. Standards form the fundamental building blocks for product development by establishing consistent protocols that can be universally understood and adopted. This helps fuel compatibility and interoperability and simplifies product development, and speeds time-to-market.

IEEE Standards Association (IEEE SA) is a leading consensus-building organization within the IEEE. This Session intends to provide an overview of the operation of the IEEE Standards Association and introduce the process of initiating and developing IEEE standards. The Session outlines the standard development process including key steps such as proposal, initiation, development, review, approval, and publication of standards.

The development of innovative technologies for power delivery systems and components is accelerating to meet the technical demands to support new market applications such as smart power everywhere, high-performance computing, and wearables as well as advancements in high-speed data, handheld devices, and edge computing. Standards, recommended practices, and guidelines are required to confirm and validate the technical performance and reliability of evolving power delivery systems and components. This Session will also provide a brief overview of the standards development activity within IEEE Power Electronics Society (PELS). It will cover the milestones and schedule of the standards development process and the methodology that drives open discussions to arrive at consensus to ensure that power delivery is sufficient and dependable to support evolving markets that meet consumer needs. The presentation will briefly cover a few key technical details of past and current projects as examples of the advancement of validation methodologies required for new applications to support the evolving markets.

Different from standards, technology roadmaps are documents that stimulate an industry-wide dialogue to address the many facets and challenges of the development and implementation of an emerging technology. Technology roadmaps provide direction for companies looking to expand their technological processes through advancements in their industries. This Session will present information about technology roadmaps currently ongoing at the Power Electronics Society, on technologies for wide bandgap power semiconductors and distributed energy resources. The presenters will talk about how the volunteers can lead and engage in the development of IEEE standards and roadmaps.

13:30-15:00	IEEE Standards Association and IEEE Standards Development Procedure Meng Zhao , Senior Standard Manager of IEEE China
15:00-15:30	Break

15:30-16:20	PELSC Sustaining Technology by Authenticating Technical Performance and Verifying Reliability of Current and Emerging Power Technologies Matt Wilkowski , Chair of Standards Committee of IEEE Power Electronics Society
	IEEE Roadmap Activities within the Power Electronics Society (PELS) - Process and Engagement Liuchen Chang , Immediate Past President of IEEE Power Electronics Society
16:20-17:00	Q&A, and discussions

Bios of Presenters



Meng Zhao, Senior Standard Manager, IEEE China office

Meng Zhao as the Senior Standard Manager, IEEE China who promotes emerging technology standardization in China, undertakes research and contributes insight/findings to IEEE-SA's strategy, identifies new areas and lines of business for IEEE-SA to explore, invites and coordinates the participation of local and international industry and individuals in standards-related activities, provides guidance/training for IEEE working groups and working group meetings, guides and oversees progress, development, and completion of standards projects in assigned region. Meng has a master's degree in

electronics engineering from Beijing University of Posts & Telecom. Before joining IEEE, Meng had more than 10 years of experience in standardization and served as the manager, standards marketing projects at Huawei Technologies and senior research engineer at ZTE.

Matt Wilkowski, Chair of Standards Committee of IEEE Power Electronics Society



Matt Wilkowski is the chairperson for the Power Electronics Society Standards Committee known as PELSC. He is also the current chairperson of IEC TC 51 Magnetic Components, Ferrite, and Magnetic Powder Materials. He is an IEEE Fellow recognized for his contributions to design and productize magnetic components integrated in power delivery systems over the past forty-five years. He has used improvements in standards and recommended practices to drive and validate new magnetic components and magnetic materials throughout his career. He is currently employed as a design consultant for Würth Elektronik.



Liuchen Chang, Immediate Past President of IEEE Power Electronics Society

Liuchen Chang is a Professor Emeritus at the University of New Brunswick. He was the NSERC Chair in Environmental Design Engineering in 2001-2007, and the Principal Investigator of the Canadian Wind Energy Strategic Network in 2008-2014. He has been an IEEE volunteer for over 30 years, including serving as VP of Conferences in 2017-2020 and President of the IEEE Power Electronics Society in 2021-2022. He is a fellow of the Canadian Academy of Engineering. He has published more than 400 refereed papers in journals and conference

proceedings. Dr. Chang has focused on research, development, demonstration, and deployment of renewable energy-based distributed energy systems.

Industry Forum

Industry Forum: Power Semiconductor Devices

Location: Meeting Room 11 石室厅 Time/Date: 08:30-12:10, May 19, Sunday

Chairs:

Guoyou Liu, Southwest Jiaotong University, China; **Xu Yang**, Xi'an Jiaotong University, China
Jianing Wang, Hefei University of Technology, China; **Zeliang Shu**, Southwest Jiaotong University, China

08:30-08:55	Infineon Leading Power Semiconductor Technology Enable High Efficiency and Reliable Power Electronics System Albert Chen , Senior Director, Infineon GC Industrial and Infrastructure
08:55-09:20	Reliability Enhancement of A Double-sided Bi-directional Power Module by Reducing Heat Concentration and Thermo-Mechanical Stress Yun-Hui Mei , Professor, Executive Dean of Electrical Engineering, Tiangong University
09:20-09:45	Mitsubishi Electric SiC technology and products Bo Hu , Project Manager, Mitsubishi Electric & Electronics (Shanghai) Co., Ltd.
09:45-10:10	A New Split-output Package Structure for Enhancing Short-circuit Stress Haoze Luo , Professor, Zhejiang University
10:10-10:30	Break
10:30-10:55	Lifetime Modeling of Power Semiconductor Modules Considering Physics-of-failure Dynamics Xin Yang , Professor, Hunan University
10:55-11:20	Research on Packaging and Integration Technologies of SiC Power Device Cai Chen , Professor, Huazhong University of Science & Technology
11:20-11:45	Multichip Power Module Design and Optimization Helong Li , Professor, Hefei University of Technology
11:45-12:10	Thermal Reliability Test Solutions of Power Devices George Qiu , General Manager, BasiCAE Software Technology Limited

CHAIRS



Guoyou Liu

Professor, Southwest Jiaotong University.



Xu Yang

Professor, Xi'an Jiaotong University.



Jianing Wang

Professor, Hefei University of Technology.



Zeliang Shu

Professor, Southwest Jiaotong University.

INVITED SPEAKERS



Albert Chen

Senior Director, Infineon GC Industrial and Infrastructure.



Yun-Hui Mei

Professor, Executive Dean of Electrical Engineering, Tiangong University.



Bo Hu

Project Manager, Mitsubishi Electric & Electronics (Shanghai) Co., Ltd.



Haoze Luo

Professor, Zhejiang University.



Xin Yang

Professor, Hunan University.



Cai Chen

Professor, Huazhong University of Science & Technology.



Helong Li

Professor, Hefei University of Technology.



George Qiu

General Manager, BasiCAE Software Technology Limited.

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886	P-B-126	888	P-B-127	889	P-B-128	891	P-B-129	892	P-B-130
895	Oral 35	896	P-B-131	897	Oral 30	900	P-B-132	901	Oral 5
902	Oral 4	903	Oral 46	904	P-B-133	907	P-B-134	908	Oral 15
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927	P-B-144	928	Oral 29	929	P-B-145	930	Oral 30	931	Oral 52
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952	Oral 31	953	Oral 28	954	Oral 1	955	P-B-157	956	Oral 37
957	Oral 51	958	P-B-158	960	P-B-159	961	P-B-160	962	P-B-161
963	Oral 12	964	Oral 46	968	P-B-162	969	Oral 44	971	P-B-163
972	P-B-164	974	Oral 28	975	P-B-165	976	Oral 39	977	Oral 10
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985	Oral 15	986	Oral 13	987	P-B-169	988	P-B-170	989	Oral 56
990	P-B-171	992	P-B-172	993	P-B-173	994	Oral 29	995	P-B-174
996	P-B-175	997	Oral 53	998	P-B-176	999	P-B-177	1001	Oral 34
1002	P-B-178	1004	P-B-179	1006	Oral 17	1007	P-B-180	1008	P-B-181
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1034	Oral 8	1035	P-B-190	1036	Oral 54	1037	P-B-191	1038	P-B-192
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Oral Presentations

Oral 1: Devices, Packaging and System Integration

Location: Meeting Room 1 (琴台厅) Time/Date: 08:30-10:00, May 19, Sunday

Chairs: Jun Wang, *Hunan University, China*
Han Cui, *Tianjin University, China*

Time	Paper Information	Submission ID
08:30-08:45	System Analysis of Integration Methods in Novel Electric Motor Drive Systems <i>Yury Mikhaylov; Giampaolo Buticchi</i>	85
08:45-09:00	A Face-to-Face Layout of Silicon Carbide Power Module Co-Designed Considering Electro-Thermal Properties <i>Jinpeng Cheng; Jinxiao Wei; Yongfeng Gao; Liyu Yao; Hao Feng; Li Ran</i>	520
09:00-09:15	A Study of Optimal Gate Pattern Derivation Method Based on Switching Waveforms of IGBTs by Automatic Pattern Sweep in Active Gate Control <i>Kento Honda; Kanta Suzuki; Daisuke Hioe; Masaki Furukawa; Hidemine Obara; Tomoki Yokoyama</i>	1016
09:15-09:30	Digital Active Gate Driving Automatically Minimizing Switching Loss While Keeping Surge Current Below User-Specified Target <i>Toshiaki Inuma; Dibo Zhang; Katsuhiko Hata; Kazuto Mikami; Kenji Hatori; Koji Tanaka; Wataru Saito; Makoto Takamiya</i>	590
09:30-09:45	Iron Loss Measurement in Winding Structure of Inductors for Low Permeability Magnetic Materials <i>Yedong Wang; Keiji Wada</i>	926
09:45-10:00	Bond Wire Lift-off Sensor Circuit for Power Devices Integrated in Gate Driver IC <i>Yaogan Liang; Hiroki Yano; Haoxi Zhou; Katsuhiko Hata; Makoto Takamiya</i>	954

Oral 2: Power Converters and Control (I)

Location: Meeting Room 2 (故里厅) Time/Date: 08:30-10:00, May 19, Sunday

Chairs: Min Chen, *Zhejiang University, China*
Quanming Luo, *Chongqing University, China*

Time	Paper Information	Submission ID
08:30-08:45	Multilevel Pulse Train Control for Three-Phase Voltage Source Inverter in dq Rotating Coordinate System <i>Yifan Wang; Jianping Xu; Xia Guo</i>	6
08:45-09:00	Virtual Oscillator Control Without Third Order Harmonics Using Average Filtering Method <i>Wenxuan Zhang; Weimin Wu; Kaixiang Yu; Xiaobin Mu; Henry Chung; Frede Blaabjerg; Mohamed Orabi</i>	102

09:00-09:15	Vertical LLC Converter for High-Current Datacenter Application <i>Pinhe Wang; Bima Nugraha Sanusi; Tiberiu Gabriel Zsurzsan; Michael A. E. Andersen; Ziwei Ouyang</i>	148
09:15-09:30	A Novel LLC Synchronous Rectifier Driving Scheme Based on Time Domain Analysis <i>Yuxin Zhang; Jie Chen; Jingke Cai; Yong Wang</i>	159
09:30-09:45	Grid-Side High-Order Harmonics Mitigation for Three-Phase Four-Wire Inverter Based on Repetitive Control and Virtual Filter <i>Lei Zhang; Ziheng Xiao; Fei Deng; Zhigang Yao; Haoxin Yang; Yi Tang</i>	266
09:45-10:00	A Symmetrical Control Scheme for a Resonant Switched-Capacitor Converter with Inverted Output Voltage <i>Kewei Shao; Deqiu Yang; Wenqi Du; Junming Zhang</i>	317
Oral 3: Motor Drives and Motion Control (I)		
Location: Meeting Room 3 (鼓楼厅) Time/Date: 08:30-10:00, May 19, Sunday Chairs: Chunhua Liu, <i>City University of Hong Kong, China</i> Xiaoqiang Li, <i>China University of Mining and Technology, China</i>		
Time	Paper Information	Submission ID
08:30-08:45	Anti-Disturbance Control Scheme Based on Cascade GPIO for Induction Motor <i>Huaibin Pang; Kun Gao; Hanbing Dan; Mengchao Qian; Mei Su</i>	70
08:45-09:00	Separation of On-load Thrust Ripple of Moving-magnet Linear Motor Based on Frozen Permeability <i>Qinwei Sun; Mingyi Wang; Minghong Liu; Liyi Li</i>	77
09:00-09:15	Analysis of Influence of Current Harmonic Optimization on Noise of a Built-in Permanent Magnet Synchronous Motor <i>Liang Dong; Jianqiao Yang; Mingao Qin; Zhongcai Qiu</i>	154
09:15-09:30	Full-Range Non-Linear Adaptive Flux-Weakening Control for IPM and SynRM Drives Including MTPV <i>Matteo Beligaj; Sandro Calligaro; Roberto Petrella</i>	1216
09:30-09:45	A Novel Pulse Modulation Strategy Used for Permanent Magnet Synchronous Motor Drives <i>Yuxiang Xue; Hui Li; Yingzhe Wu; Lisheng Wang; Hengbin Zhang</i>	236
09:45-10:00	Parameter Stabilization Adjustment Method for Stability Enhancement of Speed-Sensorless Induction Motors <i>Yujie Wang; Cheng Luo; Ruhan Li; Kai Yang</i>	459

Oral 4: Power Quality		
Location: Meeting Room 5 (南街厅) Time/Date: 08:30-10:00, May 19, Sunday Chairs: Hongliang Wang, <i>Hunan University, China</i> Meng Huang, <i>Wuhan University, China</i>		
Time	Paper Information	Submission ID
08:30-08:45	New Compensation Strategy of the Active Power Filter Integrating the Dynamic Optimization Compensation of Odd-Order Harmonics and the Algorithm of Operating Inverter Output Current Within the Limit Range for the Longest Time <i>Tsai-Fu Wu; Jui-Yang Chiu; Chien-Chih Hung; Yun-Hsiang Chang</i>	19
08:45-09:00	Passive Harmonic Reduction for 12-Pulse Rectifier Using Two Kinds of Unconventional Multi-Tap Inter-Phase Reactors <i>Jingfang Wang; Pengying Xiong; Chen Zhao; Teng Liu; Tianlong Yu</i>	34
09:00-09:15	A Novel 36-Pulse Rectifier with a Voltage-Quadrupling Interphase Reactor <i>Jingfang Wang; Chen Nie; Bin Wang</i>	128
09:15-09:30	An Improved Modulated Model Predictive Control for T-type Three-Level Converter <i>Jian Fang; Ruihua Li; Hanqing Wang; Bo Hu</i>	143
09:30-09:45	A Resistance-Emulating Control for AC/DC Matrix Converter Under Unbalanced Grids with Minimum Sensor Requirement <i>Weihaoyuan; Wenjing Xiong; Ting Liu; Jianheng Lin; Mei Su</i>	665
09:45-10:00	An Active Power Control Method for Enhancing Primary Frequency Control Dynamics in Grid-Forming Inverter Systems <i>Ki-Hyun Kim; Obi Stephen Arinze; Shenghui Cui; Jae-Jung Jung</i>	902
Oral 5: Electrified Transportation		
Location: Meeting Room 6 (宽巷厅) Time/Date: 08:30-10:00, May 19, Sunday Chairs: Hong Li, <i>Beijing Jiaotong University, China</i> Yongchang Zhang, <i>North China Electric Power University, China</i>		
Time	Paper Information	Submission ID
08:30-08:45	Novel Rail Transit System: AC 3kV System <i>Qunzhan Li; Kai Guo; Hui Wang; Jian Zhang</i>	184
08:45-09:00	Investigation of SISC on Electromechanical Characteristics of External Rotor Permanent Magnet Generator <i>Kai Sun; Yuling He; Xuwei Wu; Haoran Luo; Ling Tang; Jiawen Yang</i>	377

09:00-09:15	Optimization of Unpaired Timetable with Express/Local Mode for the Phenomenon of Tidal Passenger Flow <i>Pengfei Sun; Bailing Yao; Qingyuan Wang; Shikun Chen; Xinyu Lin; Zilu Huang</i>	739
09:15-09:30	Linear Active Disturbance Rejection Control for PWM Converters in Flexible DC Traction Power Supply System <i>Xiaoqiong He; Chenghao Qiu</i>	766
09:30-09:45	Train Trajectory Cooperative Optimization on Coupling Process at Junctions <i>Shikun Chen; Qingyuan Wang; Pengfei Sun; Bailing Yao</i>	793
09:45-10:00	Design of Flexible Traction Substation Based on Vv Traction Transformer <i>Xiaoqiong He; Yisong Pan</i>	901
Oral 6: Renewable Energy and Smart Grid (I)		
Location: Meeting Room 7 (窄客厅) Time/Date: 08:30-10:00, May 19, Sunday Chairs: Chuang Liu, <i>Northeast Electric Power University, China</i> Hailiang Xu, <i>China University of Petroleum (East China), China</i>		
Time	Paper Information	Submission ID
08:30-08:45	Decentralized Inertia Emulation in AC/DC Hybrid Microgrids <i>Haihua Meng; Han Deng; Haoxin Yang; Fei Deng; Zhigang Yao; Yi Tang</i>	142
08:45-09:00	Energy Management Method of PV-Battery System Based on Doubly Grounded Topology <i>Ziwei Zhang; Zhilei Yao</i>	162
09:00-09:15	An Adaptive Optimal Virtual Inertia Control Scheme for Stability Enhancement of Utility-Scale PV Power Plants <i>Diptak Pal; Mrutyunjaya Sahani; Sanjib Kumar Panda</i>	208
09:15-09:30	Decentralized Current Sharing in Islanded DC Microgrids Based on AC Frequency Droop <i>Fei Deng; Shilong Zhang; Lei Zhang; Zhigang Yao; Ziheng Xiao; Yi Tang</i>	328
09:30-09:45	Decoupled Power and Frequency Control of Offshore Wind Farms Connected With DR-HVDC Based on Consensus Algorithm <i>Yuanxiang Sun; Dehao Kong; Yongdu Wang; Zhenbin Zhang; Zhongchen Pei; Di Zhu; Jose Rodriguez; Wei Tian; Marcelo Heldwein</i>	400
09:45-10:00	Research on Decoupling of Units in Distribution Networks <i>Xuhua Liu; Weiguo Zhang; Xiaojie Shi; Lei Lin</i>	434

Oral 7: Wireless Power Transfer		
Location: Meeting Room 10 (文翁厅) Time/Date: 08:30-10:00, May 19, Sunday Chairs: Qianming Xu, <i>Hunan University, China</i> Wenxing Zhong, <i>Zhejiang University, China</i>		
Time	Paper Information	Submission ID
08:30-08:45	Analysis of Eddy Current Loss and Frequency Optimization in Seawater WPT Systems with High Distance-Diameter Ratio <i>Yilin Qiao; Zhicheng Fan; Siqi Li; Sizhao Lu; Zhe Liu; Shike Yu</i>	503
08:45-09:00	Achievement of 6.78-MHz and 3-kW Single Inverter in Continuous Operation <i>Masamichi Yamaguchi; Yasuo Uchida; Hiroki Watanabe; Keisuke Kusaka; Jun-ichi Itoh</i>	669
09:00-09:15	High Voltage, Wireless Power Transfer Based DC Power Supply <i>Suraj Jagannath Manur; Reza Mirzadarani; Mohamad Ghaffarian Niasar</i>	804
09:15-09:30	Design Method for the Coupled Pad of a Wireless Power Transfer Electric Vehicle Charger <i>Cedric Keibeck; Hans Wouters; Hassan Pervaiz; Wilmar Martinez</i>	348
09:30-09:45	Radial Rotation Angle Recognition of Wireless Power Transfer System for AUVs <i>Ben Zhang; Chaoqiang Jiang; Chen Chen; Yuanshuang Fan; Jiayu Zhou; Yong Lu</i>	769
09:45-10:00	EMI Suppression Scheme Based on Spread Spectrum Technology for High Power Wireless Electric Vehicle Charging <i>Zhecheng Zhang; Guoao Li; Ying Mei; Yizhen Lin; Jiande Wu; Xiangning He</i>	58
Oral 8: Energy Storage and Management (I)		
Location: Board Room (董事会议室) Time/Date: 08:30-10:00, May 19, Sunday Chairs: Jinwei He, <i>Tianjin University, China</i> Junming Zhang, <i>Zhejiang University, China</i>		
Time	Paper Information	Submission ID
08:30-08:45	An Isolated Hybrid Sigma Bi-directional BESS Interface with Extra-Wide Voltage Gain <i>Bima Nugraha Sanusi; Pinhe Wang; Ziwei Ouyang</i>	55
08:45-09:00	An SOC-based Adaptive Control Strategy for Pulsed Power Elimination in Hybrid Energy Storage System <i>Fangrui Kang; Xiao Zhang; Zhenxiong Wang; Yongju Luo; Hao Zhai; Hao Yi</i>	164

09:00-09:15	Aging Analysis of an Electrical-Thermal-Aging Coupled Model for Parallel Battery Packs in an Air Cooling System <i>Yutong Zhu; Xin Qi; Shunfeng Yang</i>	538
09:15-09:30	Submodule Capacitor Voltage Stability Improvement with Virtual DC Machine Control for Delta Connected Cascaded H-Bridge Converter Based ESS <i>Dong-Hwan Lee; Ki-Hyun Kim; Jae-Jung Jung</i>	933
09:30-09:45	Comparison of Battery Degradation and Power Losses Under Different SOC Balancing Methods in Cascaded H-Bridge Converter-based BESS <i>Enrique Nunes Di Pierri; Gaowen Liang; Ezequiel Rodriguez Ramos; Glen Farivar; Josep Pou</i>	1034
09:45-10:00	Input Impedance Modeling of Dual Active Bridge Converter Based on Peak Current Control <i>Wang Tian; Zhanghai Shi; Qirui Yang</i>	1234
Oral 9: Reliability, Diagnosis, and Protection (I)		
Location: VIP Lounge (青羊厅) Time/Date: 08:30-10:00, May 19, Sunday Chairs: Weimin Wu, <i>Anhui University of Science and Technology, China</i> Huimin Wang, <i>Southwest Jiaotong University, China</i>		
Time	Paper Information	Submission ID
08:30-08:45	Analysis of Bearing Electro-Erosion under Different Speeds <i>Dezhi Chen; Zhixiang Zhang; Guozhen Zhang; Jiaming Hu</i>	234
08:45-09:00	Online Identification of Lithium-ion Battery Parameters Using Recursive Least Squares for an Enhanced Static Compensator <i>Ezequiel Rodriguez Ramos; Ramon Leyva; Gaowen Liang; Enrique Alejandro Nunes Di Pierri; Josep Pou</i>	375
09:00-09:15	Fault Detection Based on Multiple Features Clustering and Unsupervised Scoring for Lithium-ion Battery Packs <i>Wenhao Nie; Zhongwei Deng; Yvxin He; Chunlin Jiang</i>	444
09:15-09:30	Advanced Phase-leg Short Circuit Protection for 3rd Generation Semiconductors <i>Kai Wing Andy Yeung; Changqing Yin; Sui Pung Victor Cheung; Tin Ho River Li</i>	519
09:30-09:45	Redundancy Design of Solid-State Transformer for Medium Voltage DC-DC Applications Considering Cost and Availability <i>Antonis Stathatos; Samuel S. Queiroz; Chengmin Li; Levy F. Costa; George Papafotiou</i>	550
09:45-10:00	Fault Detection and Isolation Method for DC Voltage Measuring Device in MMC-HVDC Systems <i>Shuguang Song; Jiakuan Lei; Wenzhong Ma</i>	600

Oral 10: WBG Device Packaging, Modeling and Reliability		
Location: Meeting Room 1 (琴台厅) Time/Date: 10:30-12:00, May 19, Sunday Chairs: Laili Wang, <i>Xi'an Jiaotong University, China</i> Wei Lai, <i>Chongqing University, China</i>		
Time	Paper Information	Submission ID
10:30-10:45	Active Gate Driving With Full 6-Bit Resolution for Different SiC MOSFETs Using Variable Gate Current Range Digital Gate Driver IC <i>Haoxi Zhou; Toshiaki Inuma; Dibo Zhang; Katsuhiko Hata; Makoto Takamiya</i>	557
10:45-11:00	Modulation Strategy for 2-SiC Hybrid Devices ANPC-DAB Converter Through Dual-Path Zero-State <i>Mengyuan Zhao; Yu Zhang; Yangfan Chen; Zhuolan Li</i>	313
11:00-11:15	A Multiloop Layout SiC Power Module for Power Loop Inductance Reduction with Reverse Current Coupling <i>Nianlong Ma; Xi Jiang; Ying Wang; Song Yuan; Runze Ouyang; Daoyong Jia; Xiaowu Gong</i>	484
11:15-11:30	Maximum Output Power Design for an 85kHz Class-D ZVS Inverter with 650V/30A SiC-MOSFETs at Any Duty Ratio and DC Input Voltage <i>Yi Xiong; Thilak Senanayake; Jun Imaoka; Masayoshi Yamamoto</i>	441
11:30-11:45	Investigations of Off-line Calibration and Consistency of SiC MOSFETs with Different Gate Structures <i>Yinda Liao; Zhiliang Xu; Huimin Wang; Xinglai Ge; Yi Wang</i>	977
11:45-12:00	Impact of Circuit Mismatches and Parasitic Parameters on Paralleling 650-V E-Mode GaN HEMTs <i>Chen Song; Shan Yin; Jinshu Lin; Hui Li</i>	1026
Oral 11: Power Converters and Control (II)		
Location: Meeting Room 2 (故里厅) Time/Date: 10:30-12:00, May 19, Sunday Chairs: Lei Lin, <i>Huazhong University of Science and Technology, China</i> Bi Liu, <i>Anhui University, China</i>		
Time	Paper Information	Submission ID
10:30-10:45	Optimal Design of Hexagonal Matrix Transformer for 48V-1V Switched-Capacitor and Series-Resonant Converter <i>Zeyuan Liu; Jiawei Liang; Haoyu Wang</i>	324
10:45-11:00	A High-Efficiency LLC Resonant Converter Based on Partial Power Processing for PV Applications <i>Shaopeng Xue; Yan Zhang; Xianting Li; Yang Li; Chunlin Lv; Jinjun Liu</i>	404



11:00-11:15	Design of A Load-Independent Bi-directional Class-E2 DC-DC Charger without External Control <i>Ziheng Liu; Jinyan Wang; Ju Gao; Hongjie Peng; Jiayin He; Chengkang Ao; Yi Zhao; Jin Wei; Yong Xie</i>	414
11:15-11:30	Smooth AC Fault Ride-Through Control Technique for Offshore Wind VSC-HVDC System Based on AIED-SM <i>Zhaopei Liang; Min Chen; Song Tang; Guannan Zhu; Chenghao Zhang; Yaoyu Zhang</i>	1172
11:30-11:45	Single-Phase Enhanced Gain Converters with Boost DC and AC Outputs <i>Shri Prakash Sonkar</i>	439
11:45-12:00	Stability Analysis of Grid-forming and Grid-following VSCs in Parallel Connected to Weak Grid <i>Zheng Fang; Yunhui Huang; Wenbo Yan; Zhenyu He; Dong Wang; Bingyu Xiong; Qingqing He; Kelian Zhou</i>	1217
Oral 12: Motor Drives and Motion Control (II)		
Location: Meeting Room 3 (鼓楼厅) Time/Date: 10:30-12:00, May 19, Sunday Chairs: Ronggang Ni, <i>Qingdao University, China</i> Chaoqun Xiang, <i>Central South University, China</i>		
Time	Paper Information	Submission ID
10:30-10:45	Control Design for Unbalanced Operation for Modular High Frequency Converters in Electric-Drive Applications <i>Sotirios Katsourinis; Konstantinos Manos; Antonios Antonopoulos</i>	576
10:45-11:00	Time Delay Implementation in Sensorless Control for Ultra-High-Speed Air Compressor Motor of Fuel-Cell Systems <i>Sung-Ho Kang; Hyun-Jun Lee; Tae-Gyeom Woo; Chang-Seok You; Sang-Hak Lim; Young-Doo Yoon</i>	582
11:00-11:15	Active Disturbance Rejection Control Based Deadbeat Predictive Current Controller for CSI-Fed SPMSM Systems <i>Youtong Wu; Yuzhuo Lu; Siwen Li; Quntao An</i>	643
11:15-11:30	Comparison and Analysis of the DTVM-MPC Strategy and FOC strategy for the PMSM Considering the Inverter Dead Time <i>Depeng Zeng; Zunheng Wang; Yueru Ren; Pengyu Gao; Kai Guo</i>	1171
11:30-11:45	Modulation Strategy of Cascaded Three-PMSM System Fed by a Seven-Leg Inverter <i>Yong Chen; Chunhua Liu; Hao Wen; Yuxin Liu; Zhengge Chen</i>	941
11:45-12:00	Pulse Switching Shock Suppression Method of PWM Inverter for Pole-Changing Induction Motor <i>Hiroataka Kato; Hiroki Watanabe; Jun-ichi Itoh; Masashi Kobayashi</i>	963



Oral 13: Renewable Energy and Smart Grid (II)		
Location: Meeting Room 5 (南街厅) Time/Date: 10:30-12:00, May 19, Sunday Chairs: Yongheng Yang, <i>Zhejiang University, China</i> Wenli Yao, <i>Northwestern Polytechnical University, China</i>		
Time	Paper Information	Submission ID
10:30-10:45	Coordinated Power Control of PV Generation, Electric Mobility and Electric Heating in Different Grids <i>Nikolaos Damianakis; Gautham Ram Chandra Mouli; Yunhe Yu; Pavol Bauer</i>	515
10:45-11:00	Control Strategy of Microgrid Based on Single-Stage PV Microinverter without Energy Storage <i>Fangchao Ji; Jia Liu; Xuewen Li; Xueqian Cao; Yue Wang; Jinjun Liu</i>	639
11:00-11:15	Scheme Design of Photovoltaic Access to the Flexible Traction Power Substation <i>Xiaoqiong He; Jiancong Yang</i>	830
11:15-11:30	Regional Optimal Scheduling of Distribution Network Based on Soft Open Point <i>Jiamei Zhang; Kai Sun</i>	883
11:30-11:45	Operation Risk Assessment of Power System with High Proportion of New Energy Integration <i>Shaocong Xu; Shahid Mastoi Muhammad; Delin Wang</i>	986
11:45-12:00	Control Strategy of Grid-Tied Converter Considering Negative-Sequence Voltage of PCC Under Unbalanced Voltages <i>Jaehoon Choi; Yongsug Suh</i>	1069
Oral 14: Energy Storage and Management (II)		
Location: Meeting Room 6 (宽巷厅) Time/Date: 10:30-12:00, May 19, Sunday Chairs: Li Zhang, <i>Hohai University, China</i> Yigeng Huangpu, <i>Northwestern Polytechnical University, China</i>		
Time	Paper Information	Submission ID
10:30-10:45	Online Parameter Tuning Method of Multi-Resonant Controllers for Grid-Forming Inverters <i>Zhengyang Zhou; Zeng Liu; Pengcheng Han; Xinghai Geng; Jinjun Liu; Qingbin Wang</i>	1238
10:45-11:00	A Self-Tuning Method of PI Controllers for DC/AC Inverters Based on Energy Balance Algorithm <i>Qiang Zhang; Yiming Huo</i>	1242

11:00-11:15	AI for Smart Battery State Estimation: A Perspective <i>Xin Sui; Yunhong Che; Nicolai André Weinreich; Yusheng Zheng; Shan He; Remus Teodorescu</i>	1248
11:15-11:30	Light Load Efficiency Enhancement Strategy for Single-Stage On-board EV Charger by Using Adaptive Switching Frequency <i>Million Gerado Geda; Huigyeong Song; Ba Phu Do; Sewan Choi</i>	510
11:30-11:45	Enhancing EV Charging Efficiency: Conversion of Bidirectional Two-Stage On-board Chargers to Single-Stage Topologies <i>Wout Vanderwegen; Wilmar Martinez</i>	1025
11:45-12:00	Direct Leakage Current Control Method of Single-Phase Non-Isolated EV Charger <i>Juwon Lee; Dongsu Lee; Seongil Lee; Jung-Ik Ha</i>	1232
Oral 15: Reliability, Diagnosis, and Protection (II)		
Location: Meeting Room 7 (窄巷厅) Time/Date: 10:30-12:00, May 19, Sunday Chairs: Ke Ma, <i>Shanghai Jiao Tong University, China</i> Andrii Chub, <i>Tallinn University of Technology, Estonia</i>		
Time	Paper Information	Submission ID
10:30-10:45	Fault Diagnosis of Motor Bearings with Multiple Time-Frequency Extraction Method Under Variable Speed Conditions <i>Xu Huang; Jianzhong Zhang; Zheng Xu; Shuai Xu</i>	614
10:45-11:00	Fault Diagnosis Method for Metro Fully Controlled Rectifier Unit Based on Current Path <i>Xiaoqiong He; Xiang Jin</i>	786
11:00-11:15	Single-Switch Open-Circuit Fault Diagnosis Based on Error Current for Active Power Filter <i>Li Zeng; Xiaoqiong He</i>	908
11:15-11:30	Research on Discharge Characteristic of Metallized Film Capacitors Based on Electrical and Acoustic Signals <i>Xinyi Yan; Linzi Zheng; Qiming Sun; Qing Xiong; Lingyu Zhu; Shengchang Ji; Jiangang Xu; Yang Xu</i>	985
11:30-11:45	Quick Diagnosis of Open phase Fault for PMSM drive with Model Predictive Control <i>Zheng Xu; Xu Huang</i>	1164
11:45-12:00	Thermal Resistance Measurement and Failure Analysis of Multi-Discrete SiC MOSFET System Module <i>Yichao Ji; Jianing Wang; Shaolin Yu; Donglei Zhang; Zhaoyang Wei</i>	1224

Oral 16: DC Power Systems		
Location: Meeting Room 10 (文翁厅) Time/Date: 10:30-12:00, May 19, Sunday Chairs: Weilin Li, <i>Northwestern Polytechnical University, China</i> Zeng Liu, <i>Xi'an Jiaotong University, China</i>		
Time	Paper Information	Submission ID
10:30-10:45	Error Storage Based Online Linearization of the Nonlinear Transfer Function of a High Power Dual Active Bridge <i>Tobias Merz; Fabian Sommer; Rüdiger Schwendemann; Hongyi Sui; Marc Hiller</i>	64
10:45-11:00	Talkative Power Conversion Strategy Based on Direct Sequence Spread Spectrum with Gold Sequence <i>Kaihui Tang; Yue Hui; Ke Chen; Jiande Wu; Xiangning He</i>	155
11:00-11:15	Research on Stability Control Strategy of DC Microgrid Based on Consistency Algorithm <i>Jinghua Li; Muyin Zheng; Honghe Xie; Jia Chen</i>	277
11:15-11:30	Analysis and Control of Partial Power Processing Based on LLC Resonant Converter for Fuel Cells <i>Bixuan Yang; Zhigang Yao; Gang Luo; Linglong Jiang; Weirong Chen</i>	725
11:30-11:45	An Improved Droop Control Scheme for Enhancing Dynamic Current Sharing Performance in Autonomous DC Microgrids <i>Qingchao Song; Ka-Hong Loo; Gaoxiang Chen; Xingxing Chen; Di Mou; Junwei Liu</i>	845
11:45-12:00	Comparative Analysis on Soft-charging Solutions of Switched-Capacitor DC-DC Converters <i>Jianing Quan; Qingyuan Gao; Xu Yang</i>	853
Oral 17: Artificial Intelligence Applications in Power Electronics		
Location: Board Room(董事会议室) Time/Date: 10:30-12:00, May 19, Sunday Chairs: Cungang Hu, <i>Anhui University, China</i> Yanbo Wang, <i>Aalborg Univeristy, Denmark</i>		
Time	Paper Information	Submission ID
10:30-10:45	A Streamlined and Intuitive AI-Powered Analysis and Design Tool for Resonant Converters <i>Ziheng Xiao; Yu Jiang; Chang Wang; Yi Tang</i>	220
10:45-11:00	AI-Assisted Peak Efficiency Searching of CLLC Resonant Converters in Step-down Conditions <i>Ziheng Xiao; Yu Jiang; Zhigang Yao; Yi Tang</i>	222

11:00-11:15	Reinforcement Learning Based Method for Online Parameter Identification of the Permanent Magnet Synchronous Machines <i>Xuan Minh Bui; Faz Rahman; Rukmi Dutta; Nuwantha Fernando</i>	564
11:15-11:30	AI-Driven, Model-Free Current Control: A Deep Symbolic Approach for Optimal Induction Machine Performance <i>Muhammad Usama; Jaehong Kim; Yunkyung Hwang</i>	573
11:30-11:45	Capacitance and ESR Estimation of DC-link Capacitors in AC Machine Drives Based on Hybrid CNN-Attention Model <i>Dyan Puspita Apsari; Dong-Choon Lee</i>	1006
11:45-12:00	Cross Cut Heatsink Optimization Design by Applying Conditional Generative Adversarial Network <i>Jiaze Kong; Xiaobing Shen; Ruth Vazquez Sabariego; Wilmar Martinez</i>	1027
Oral 18: Emerging Power Electronics and Other Applications		
Location: VIP Lounge (青羊厅) Time/Date: 10:30-12:00, May 19, Sunday Chairs: Xin Xiang, Zhejiang University, China Hui Zhang, Wuhan University, China		
Time	Paper Information	Submission ID
10:30-10:45	Automated Triple Pulse Testbed (ATPT) 1.0 - Large-Signal Hardware-in-the-loop Characterization Platform for Power Magnetics <i>Binyu Cui; Jun Wang; Xibo Yuan; Juan Aguarón de Blas; Alfonso Martínez de la Torre; Francisco Cabaleiro</i>	396
10:45-11:00	Soft-Switching Control Method of Interleaved Three-Level Boost Converter in near-CRM for Fuel Cells <i>Zhigang Yao; Xinyu He; Muyang Liu; Kangjia Zhang; Yi Tang</i>	411
11:00-11:15	An Improved Integrated Grid Inductor-Transformer Magnetic Structure for Single-Stage EV Charger <i>Dinh Bao-Hung Nguyen; Huu-Phuc Kieu; Million Gerado Geda; Sewan Choi</i>	472
11:15-11:30	Investigation of Conducted EMI Emission and Mitigation Techniques in a USB-C Charger <i>Pinhe Wang; Jinshi Du; Zheng Miao; Tiberiu Gabriel Zsurzsan; Michael A. E. Andersen; Ziwei Ouyang</i>	634
11:30-11:45	Analysis and Comparative Evaluation of a Modularized Bridge Rectifier MVAC-LVDC Solid-State Transformer <i>Giacomo Andrioli; Sandro Calligaro; Roberto Petrella; Johann Walter Kolar; Jonas Huber</i>	690
11:45-12:00	Resonance Type Electrical Variable Capacitor with Reduced Active Devices Loss for 13.56 MHz RF Plasam System <i>Heewon Choi; Yongsug Suh; Cheonyong Lim; Hongmin Kim; Cheonghyeon Hwang</i>	811

Oral 19: Power Converters and Control (III)		
Location: Meeting Room 6 (宽巷厅) Time/Date: 13:30-15:00, May 19, Sunday Chairs: Xiaoqiang Guo, Yanshan University, China Dehong Zhou, University of Electronic Science and Technology of China, China		
Time	Paper Information	Submission ID
13:30-13:45	Switched Impedance Source Based Series-Parallel Hybrid Converters with Multiple AC and single DC Boost Output <i>Shri Prakash Sonkar</i>	452
13:45-14:00	Design and Control Method of T-Type Three-Level LLC Converter for Wide Input Voltage Application <i>Linglong Jiang; Zhigang Yao; Gang Luo; Bixuan Yang; Weirong Chen</i>	530
14:00-14:15	Experimental Verification of Flying Capacitor Converter Utilizing Singular Auxiliary Chopper Circuit <i>Nour Hamdan; Makoto Hagiwara</i>	542
14:15-14:30	A Simplified Design and MPPT Method for 1kW Single-Stage Flyback-Type Micro Inverter <i>Zhichong Shao; Jiahao Li; Lingfeng Jiang; Jie Chen; Yong Wang</i>	602
14:30-14:45	A DFIG Impedance Reshaping Method Based on Offsetting Rotor Current Dynamic to Solve the Instability Issue Caused by PLL <i>Bochen Luo; Xiaoling Xiong; Ziming Sun; Longcan Li</i>	616
14:45-15:00	A Complete Common-Mode Voltage Reduction Method for MMC with Output Current and Voltage Fluctuation Optimization <i>Tianxiang Yin; Lei Lin; Li Zhang; Xiaojie Shi; Jingjie Xu</i>	620
Oral 20: Motor Drives and Motion Control (III)		
Location: Meeting Room 2 (故里厅) Time/Date: 13:30-15:00, May 19, Sunday Chairs: Dong Jiang, Huazhong University of Science and Technology, China Yanping Zhang, Xi'an University of Technology, China		
Time	Paper Information	Submission ID
13:30-13:45	New Flux Principle Topology of Single-Phase Generator with Ring Winding <i>Xue Yu; Zhiwei Ma; Xuyang Liu; Weiwei Geng</i>	1033
13:45-14:00	Implementation of Real-Time Parameter Estimation for PMSM Using 10 MHz Multisampling Deadbeat Control with Composite Vector of PWM Pulses <i>Kakeru Innami; Daisuke Hiroe; Xiaohan Zhang; Kantaro Yoshimoto; Tomoki Yokoyama</i>	1042

14:00-14:15	MPTA Control for PMSM Drives Based on Virtual Signal Injection with Parameter Change Compensation <i>Maowen Tang; Junyu Zhao; Yong Yu; Dianguo Xu</i>	1145
14:15-14:30	An Improved Power Supply Switching Method of Segmented Long Primary Linear Motors for High-Speed Applications <i>Cong Zhao; Zixin Li; Fanqiang Gao; Fei Xu; Hang Zhang; Yanfei Li; Yaohua Li</i>	1246
14:30-14:45	Six-Step Voltage Extended on Torque Adaptation For PMSM Field-Weakening Control <i>Yanping Zhang; Yuhui Zhen; Zhonggang Yin; Dongjin Wang</i>	427
14:45-15:00	Research on Improved Direct Power Control Method of Urban Rail Flexible Traction Power Supply System <i>Xiaoqiong He; Yuyang Liu; Pengcheng Zhao; Yahui Pang; Feixiang Shan</i>	912
Oral 21: Applications of Power Electronics Enabled by Wide-Bandgap Devices (I)		
Location: Meeting Room 3 (鼓楼厅) Time/Date: 13:30-15:00, May 19, Sunday Chairs: Haoze Luo, <i>Zhejiang University, China</i> Hongbo Zhao, <i>Aalborg University, Denmark</i>		
Time	Paper Information	Submission ID
13:30-13:45	Realization of an Online Junction Temperature Monitoring Scheme of SiC MOSFET Based on On-state Voltage Drop <i>Gengle Liang; Huimin Wang; Xinglai Ge; Yi Wang</i>	1245
13:45-14:00	Comparison of Short-Term Over-current Capability of SiC Devices Using Microchannel Cooling Below and on Top of the Chip <i>Shubhangi Bhadoria; Soundhariya G S; Hans-Peter Nee</i>	98
14:00-14:15	GaN Advantage over MOSFET in Inverters for Drones. An Experimental Comparison <i>Marco Palma; Federico Unnia; Michael de Rooij</i>	113
14:15-14:30	Comparison of Two Third-Generation 10 kV SiC MOSFET Die's Switching Performance on a System Level <i>Morten Rahr Nielsen; Martin Kjær; Hongbo Zhao; Michael Møller Bech; Stig Munk-Nielsen</i>	300
14:30-14:45	Modeling SiC MOSFET and Switching Speed Limitation <i>Zhi Yang</i>	397
14:45-15:00	Closed-Loop Current Control of a Three-Phase, Two-Level Medium Voltage Power Converter Enabled by 10 kV SiC MOSFETs <i>Morten Rahr Nielsen; Martin Kjær; Hongbo Zhao; Michael Møller Bech; Stig Munk-Nielsen</i>	301

Oral 22: Smart Control and Operation of Modern Energy Storage Systems		
Location: Meeting Room 5 (南街厅) Time/Date: 13:30-15:00, May 19, Sunday Chairs: Pengfeng Lin, <i>Shanghai Jiao Tong University, China</i> Caizhi Zhang, <i>Chongqing University, China</i>		
Time	Paper Information	Submission ID
13:30-13:45	Adaptive Droop Control Method for Bidirectional Modular Grid-Side Converter <i>Jungho Jeon; Paul Jang</i>	1166
13:45-14:00	Research on Three-phase LLC Resonant Converter Suitable for Electro-Propulsion Power Supply <i>Hongyuan Zhao; Xinbo Ruan; Chaochao Shen</i>	919
14:00-14:15	Modeling of Small-Signal Impedance for DC Microgrids with Distributed Hierarchical Control <i>Tao Hong; Sucheng Liu; Taohu Zhou; Long Li; Qianjin Zhang; Xiaodong Liu</i>	1125
14:15-14:30	Evolutionary Optimization Algorithm Based Optimal Tuning of Cascaded Control Scheme for Single-Stage AC-DC Solid-State-Transformers <i>Jaydeep Saha; Diptak Pal; Sanjib Kumar Panda</i>	51
14:30-14:45	Improved Control Algorithms for Battery Management Systems to Reduce Redistribution of Charge within Energy Storage Systems <i>Pit Mootz; Andreas Johann Hanschek; Aleksandra Stanojevic; Petar J. Grbovic</i>	513
14:45-15:00	Stability Analysis of Grid-Connected Wind Power Systems Based on SiC Devices <i>Ganyao Wang; Jing Lyu; Chuanwei Lin; Han Wang; Yu Yang</i>	794
Oral 23: Applications of Grid-Forming Inverter-Based Resources in Modern Power Systems		
Location: Meeting Room 8 (浣花厅) Time/Date: 13:30-15:00, May 19, Sunday Chairs: Heng Wu, <i>Aalborg University, Denmark</i> Teng Liu, <i>China Southern Power Grid, China</i>		
Time	Paper Information	Submission ID
13:30-13:45	Grid-Forming Capability Transfer and Active Power Flow Control in a VSC-HVDC System <i>Cheng Ai; Yitong Li; Chunpeng Li; Yuexi Yang; Minsung Kim; Jinjun Liu</i>	156
13:45-14:00	Optimized Design of the AC-Side Inductance for Grid-Forming Inverter <i>Lei Gao; Jing Lyu; Han Wang</i>	468

14:00-14:15	An Improved Virtual Impedance Method for Single-loop Controlled Grid-Forming Inverters to Suppress Low-frequency Oscillations <i>Xuetao Chen; Chao Wu; Yong Wang</i>	594
14:15-14:30	Maximum Current Contribution of Grid-Forming MMCs under Asymmetrical Grid Faults <i>Xiaonan Gao; Xiongfei Wang</i>	608
14:30-14:45	A Novel Grid-Forming Control Strategy for Two-Stage PV Systems with Improved Power Output Capability <i>Ziwen Zhao; Ronghui An; Jinjun Liu; Zhiheng Huang; Hongwei Zhou; Dapeng Lu</i>	1126
14:45-15:00	Impact of Submodule Energy Balancing on Grid Emulation Performance of Modular Multilevel Converters <i>Ming Jia; Amandus Bach; Jan Mathé; Zhan Ma; Daniel von den Hoff; Rik W. De Doncker</i>	1167

Oral 24: Innovation in Motor Drive Systems for Electric Vehicles (I)

Location: Meeting Room 7 (蓉巷厅) Time/Date: 13:30-15:00, May 19, Sunday

Chairs: Lefei Ge, *Northwestern Polytechnical University, China*

Dianxu Xiao, *The Hong Kong University of Science and Technology (Guangzhou), China*

Time	Paper Information	Submission ID
13:30-13:45	An ESO-Based Terminal Sliding Mode Control for PMSM Speed Regulation System With Improved Double Power Reaching Law <i>Mengxi Dang; Manfeng Dou; Changliang Dang; Dongdong Zhao; Zhiguang Hua</i>	280
13:45-14:00	Analysis and Optimization of LC Filter Components for TCM-based Zero Voltage Switching Two-Level Three-Phase Inverters for Electric Vehicle Drive Systems <i>Khizra Abbas; Hans-Peter Nee</i>	512
14:00-14:15	Disturbance Attenuation-Based Full Closed-Loop FCS Model Predictive Position Control for PMSM-based Actuators used in Robotics <i>Chao Gong; Yunshu Liu; Xing Zhao; Xiaotian Zhang; Jose Rodriguez</i>	531
14:15-14:30	A Novel Current Prediction Method for SRM Based on Reluctance Compensation <i>Nan Du; Jiale Huang; Jixuan Guo; Shoujun Song; Jose Rodriguez; Lefei Ge</i>	585
14:30-14:45	A Study of Multiple Inverter Integrated Motor with Laminating Coil End <i>Koki Takeuchi; Kan Akatsu</i>	772
14:45-15:00	Dual Series-End Unit-Based Eight-Leg VSI for Dual Three-Phase Motor Drives <i>Zhiping Dong; Senyi Liu; Rundong Huang; Bowen Zhang; Tianci Wang; Chunhua Liu</i>	778

Oral 25: Emerging Advances in Grid-Connected Renewable Systems

Location: Board Room (董事会议室) Time/Date: 13:30-15:00, May 19, Sunday

Chairs: Shan He, *Kiel University, Germany*

Zhiqing Yang, *Hefei University of Technology, China*

Time	Paper Information	Submission ID
13:30-13:45	Mechanism Analysis of Near Fundamental-Frequency Oscillation in an Actual DFIG-Based Wind Farm Connected with MMC-HVDC <i>Yu Yang; Jing Lyu; Xiao Wang; Ganyao Wang; Lei Gao</i>	137
13:45-14:00	Symmetrical Transformer for Medium-Voltage Medium-Frequency ISOP Three-Phase LLC SST <i>Reza Mirzadarani; Zhengzhao Li; Zian Qin; Peter Vaessen; Pavol Bauer; Lou Van Lieshout; Mahesh Itraj; Mohamad Ghaffarian Niasar</i>	814
14:00-14:15	Droop Control of Three-phase Microgrid Inverter Under Unbalanced Load with Particle Swarm Optimization Algorithm <i>Zerong Chen; Yitao Liu; Xudong Zhang</i>	561
14:15-14:30	An Intelligent and Precise Grid Impedance Identification Scheme <i>Yuan Qiu; Yanbo Wang; Yanjun Tian; Zhe Chen</i>	4
14:30-14:45	Soft-Start Procedure for Four-Switch Buck-Boost Converter with PCCM ZVS Modulation Scheme <i>Feiming Liu; Jianping Xu; Zhengge Chen</i>	90
14:45-15:00	Comparative Analysis of Grid-Forming Controls Impact on Stability of Energy Islands <i>Arash Joly; Mehdi Savaghebi; Gen Li; Nicolaos Antonio Cutululis</i>	296

Oral 26: Advanced Modeling, Analysis, and Control of Power-electronic-based Modern Power Systems (I)

Location: VIP Lounge (青羊厅) Time/Date: 13:30-15:00, May 19, Sunday

Chairs: Weihua Zhou, *Monash University, Australia*

Zhengge Chen, *Southwest Jiaotong University, China*

Time	Paper Information	Submission ID
13:30-13:45	Impedance Modeling for Modular Multilevel Matrix Converter Considering Differ-frequency Coupling Harmonics <i>Yuwei Sun; Cong Tao; Chao Fu; Jingtian Chang; Xiixin Zha; Guanghui Li</i>	257
13:45-14:00	A Novel DC-bias Current Suppression Strategy for DAB converter under Triple-Phase-Shift Modulation <i>Ning Wang; Yanbo Wang; Zhe Chen</i>	303

14:00-14:15	Frequency Characteristics Analysis of Modular Multilevel Converters with Integrated Battery Energy Storage System <i>Zeheng Sun; Yingzong Jiao; Binbin Li</i>	424
14:15-14:30	Python-Based Cross-Platform Impedance Benchmarking Tool (CroZBenMa) for IBR's EMT Models in Matlab/Simulink and PSCAD/EMTDC <i>Weihua Zhou; Nabil Mohammed; Behrooz Bahrani</i>	521
14:30-14:45	Current and Voltage Scaling for Maximum Transferable Active Power Improvement of Weak-Grid-Tied Grid-Following Inverters <i>Weihua Zhou; Behrooz Bahrani</i>	540
14:45-15:00	Self-Triggered Dynamic Consensus-based Distributed Secondary Control of DC Microgrid <i>Xuecheng Li; Changbin Hu; Shanna Luo; Heng Lu; Zhengguo Piao; Liuming Jing</i>	119

Oral 27: Power Converters and Control (IV)		
Location: Meeting Room 6 (宽巷厅) Time/Date: 15:30-17:00, May 19, Sunday Chairs: Binbin Li, Harbin Institute of Technology, China Guo Xu, Central South University, China		
Time	Paper Information	Submission ID
15:30-15:45	A Simple Seamless Switching Strategy for Four-Switch Buck-Boost Converter <i>Xiaoying Liu; Shuaicheng Hou; Mi Fang</i>	688
15:45-16:00	An Optimized Model Predictive Control Method for Hybrid ANPC With Fixed Switching Frequency <i>Zhaohui Wang; Shunfeng Yang; Yongjiang Yu</i>	702
16:00-16:15	Symmetrical Control Method for Grid-Connected Inverters in Weak Grid <i>Yichen Sun; Xinbo Ruan; Mingliang Li; Jiang Zhan</i>	747
16:15-16:30	An Improved Sigmoid Function Based Large Signal Modeling for LLC Converter <i>Yuxin Zhang; Jie Chen; Jingke Cai; Yong Wang</i>	763
16:30-16:45	Nonlinear Control Method of Multi-phase Interleaved Buck/Boost Converter Applied to Pulse Switching Power Amplifier <i>Bailong Xu; Qianming Xu; Peng Guo; Jiayu Hu; Yingzhe Jia; Weizun</i>	206
16:45-17:00	Partial Discharge Test of High-frequency Transformers with Plastic Mold for SST <i>Ritsuki Yonetomi; Keisuke Kusaka; Naoki Koike; Shinichiro Nagai</i>	761

Oral 28: Applications of Power Electronics Enabled by Wide-Bandgap Devices (II)		
Location: Meeting Room 2 (故里厅) Time/Date: 15:30-17:00, May 19, Sunday Chairs: Yingzhou Peng, Hunan University, China Zhan Shen, Southeast University, China		
Time	Paper Information	Submission ID
15:30-15:45	Light-Load Performance Comparison of Medium-Voltage Isolated DC-DC Converters Enabled by 10 kV SiC MOSFETs <i>Zhixing Yan; Gao Liu; Shaokang Luan; Morten Rahr Nielsen; Jannick Kjær Jørgensen; Benjamin Futtrup Kjærsgaard; Nianzun Qi; Bjørn Rannestad; Hongbo Zhao; Stig Munk-Nielsen</i>	415
15:45-16:00	A Dual-Channel Gate Driver Design with Active Voltage Balancing Circuit for Series Connection of SiC MOSFETs <i>Rui Wang; Drazen Dujic</i>	551
16:00-16:15	Analysis and Suppression of Commutation Overlap-Time for Bidirectional Switch-Based Current Source Converter <i>Yubin Xue; Lei Ming; Zihang Gu; Peng Wang; Jiansai Li; Zhen Xin</i>	827
16:15-16:30	A Three Phase Interleaved LLC Resonant Converter with Improved Integrated Planar Magnetics <i>Chaochao Shen; Xinbo Ruan; Hongyuan Zhao</i>	953
16:30-16:45	Design, Packaging and Evaluation of an All-SiC-Based Four-Level ANPC Power Module <i>Jupeng Pang; Wei Zhou; Kui Wang; Chao Wang; Zedong Zheng; Yongdong Li</i>	974
16:45-17:00	Design Consideration of an Isolated Gate Driver With Discrete Miller Clamp for Parallel Medium-Voltage SiC MOSFET Modules <i>Zhixing Yan; Gao Liu; Nianzun Qi; Morten Rahr Nielsen; Asger Bjørn Jørgensen; Stefan Meyer; Bjørn Rannestad; Michael Møller Bech; Hongbo Zhao; Stig Munk-Nielsen</i>	1138
Oral 29: Innovation in Motor Drive Systems for Electric Vehicles (II)		
Location: Meeting Room 3 (鼓楼厅) Time/Date: 15:30-17:00, May 19, Sunday Chairs: Chao Gong, Northwestern Polytechnical University, China Zhen Huang, Nanchang University, China		
Time	Paper Information	Submission ID
15:30-15:45	A Current Control Method with Two-step Prediction for Torque Ripple Minimization in Switched Reluctance Motor Drive System <i>Qingqing Yang; Peiyi Zhu; LeiLei Guo; Song Hu</i>	833
15:45-16:00	Highly Efficient and Power-dense GaN-Based Drive-train Inverter for Light Electric Vehicles <i>Jaydeep Saha; Rahul Sadanand Bhujade; Prasanth Sundararajan; Prasanth Sundararajan; Sai Srinivas Manohar</i>	928

16:00-16:15	Multi-Objective Optimization of Switched Reluctance Motor Based on Gaussian Process Regression Model <i>Jiaxin Zhang; Junhao Liu; Lefei Ge</i>	994
16:15-16:30	A Consideration of Power Distribution Controls for DC-Input Direct Electric-Power Converter D-EPC <i>Seiryu Yoshii; Kantaro Yoshimoto</i>	1028
16:30-16:45	A Consideration of a Mini Model Suitable for a Small Motor Evaluated on a Driving Cycle <i>Mikya Itagaki; Kantaro Yoshimoto</i>	1029
16:45-17:00	Fault Diagnosis of a Rotating Rectifier in a Three-Stage Starter-Generator Based on the Main Exciter Stator Currents <i>Shoucheng Li; Chenghao Sun; Wenjing Xu; Xinyu Li; Kele Qian; Shuye Ding; Yangwu Xu</i>	1103

Oral 30: Advanced Modeling, Analysis, and Control of Power-electronic-based Modern Power Systems (II)

Location: Meeting Room 5 (南街厅) Time/Date: 15:30-17:00, May 19, Sunday
Chairs: Liansong Xiong, *Xi'an Jiaotong University, China*
Chuanchuan Hou, *Shanghai Jiao Tong University, China*

Time	Paper Information	Submission ID
15:30-15:45	A Real-Time Implementation of Impedance-Based Stability Analysis for Inverter-Based Resources <i>Qiyang Lei; Felipe Arraño-Vargas; Shan Jiang; Georgios Konstantinou</i>	897
15:45-16:00	Impedance Modeling and Stability Analysis of Electric Springs in Weak Grid <i>Xi Zhang; Xing Zhang; Tieqiang Meng; Yongkang Chang</i>	930
16:00-16:15	Small-Signal State-Space Model for Analyzing Interaction of Voltage Source Converters in AC Networks <i>Arash Joly; Mehdi Savaghebi; Gen Li; Nicolaos Antonio Cutululis</i>	1152
16:15-16:30	Envelope Tracking Power Supply with Improved Digitally-Assisted Hysteresis Current Control <i>Ning Liu; Xinbo Ruan; Danhui Li; Qi Li</i>	502
16:30-16:45	Comparison of Coupled Direct Digital Control and Decoupled Direct Digital Control Based on D-Σ Processes for Three-Phase-Three-Wire Inverter <i>Po-Chang Lee; Tsai-Fu Wu; Jei-Yang Chiu; Chien-Chih Hung</i>	82
16:45-17:00	Inverse Polarity Half-Bridge Series Resonant Converter with Full-range Regulation <i>Jiayi Kong; Rui Sun; Xiaojing Liu; Mingjin Xu; Boyang Chen; Jiaze Song</i>	91

Oral 31: Reliability Oriented Electrical Machine Systems: Topology, Monitoring, and Control

Location: Meeting Room 8 (浣花厅) Time/Date: 15:30-17:00, May 19, Sunday
Chairs: Hui Zhang, *Xi'an University of Technology, China*
Dong Xie, *Chemnitz University of Technology, Germany*

Time	Paper Information	Submission ID
15:30-15:45	Sensorless Control of Permanent Magnet Synchronous Motor Based on Tracking Differentiator-Frequency-Locked Loop and Closed Loop Active Flux Observer <i>Sibo Wan; Huimin Wang; Yun Zuo; Yu Chang; Xinglai Ge; Yi Wang</i>	537
15:45-16:00	A Random Pulse Position Modulation Method Based on Markov Chain for Noise Suppression in PMSM Drive System <i>Zixuan Dai; Gaoli Guo; Yun Zuo; Shengdao Zhu; Xinglai Ge; Yi Wang</i>	621
16:00-16:15	Practical Fine Tuning of Cascaded Loop Control of AC Motors <i>Bo Wu; Junlei Zhu; Jiahao Chen</i>	1161
16:15-16:30	A Common-Mode Switching Transient Based Method for Monitoring Grounding Insulation Degradation of Induction Motors <i>Zhouyu Jiang; Zhen Jia; Chenwei Ma; Wensheng Song; Baojie Zhang</i>	680
16:30-16:45	A Stator Temperature Estimation Method Based on DC Voltage Injection for Sensorless Control of Permanent Magnet Synchronous Motor Drives <i>Gaoli Guo; Huimin Wang; Zixuan Dai; Yun Zuo; Yu Chang; Xinglai Ge; Yi Wang</i>	952
16:45-17:00	Frequency-Adaptive Repetitive Control Based Zero-Sequence Current Elimination in Leg Sharing Post-Fault Operation of OW Machine Drives <i>Abd Alrahman Dawara; Roland Seebacher; Annette Muetze</i>	740

Oral 32: Advanced Modulation, Control and Topology of DC-DC Converters (I)

Location: Meeting Room 7 (窄巷厅) Time/Date: 15:30-17:00, May 19, Sunday
Chairs: Nie Hou, *University of Alberta, Canada*
Jia Yao, *Nanjing University of Science and Technology, China*

Time	Paper Information	Submission ID
15:30-15:45	A Bidirectional Partial Power Processing DC-DC Converter with Voltage Step-Up/Down Capability <i>Kehuan Wang; Jianjun Ma; Dingkuan Feng; Ning Gao; Weimin Wu</i>	139
15:45-16:00	Over 98% Efficiency Floating Four-Phase Interleaved Charge-Pump Bidirectional DC-DC Converter with Wide Buck/Boost Voltage Ratio <i>Shiqiang Liu; Tomokazu Mishima; Chingming Lai</i>	161

16:00-16:15	Inner Power Control of Capacitively-Isolated Bidirectional DC-DC Converter with Auxiliary Converters <i>Nhan Trong Ngo; Yamada Tatsuya; Makoto Hagiwara</i>	175
16:15-16:30	Programmable Multi-Input Buck-Boost Converter for Photovoltaics Arrays <i>Zhongting Tang; Yi Zhang; Pooya Davari</i>	650
16:30-16:45	Model Predictive Control with Series Inductor Identification for Dual Active Bridge Converter to Improve Dynamic Response <i>Tianhao Mao; Zhiqiang Guo</i>	951
16:45-17:00	High-Frequency Link Multi-Port Converters: An Overview of Topologies, Challenges and Prospects <i>Di Mou; Ka Hong Loo; Liqiang Yuan; Quanming Luo; Chengwei Liu; Haoyu Wang; Xingxing Chen; Qingchao Song</i>	1022
Oral 33: Solid-State DC Transformers for DC Transmission and Distribution Grids (I)		
Location: Board Room (董事会议室) Time/Date: 15:30-17:00, May 19, Sunday Chairs: Jingxin Hu, <i>Nanjing University of Aeronautics and Astronautics, China</i> Shenghui Cui, <i>Seoul National University, South Korea</i>		
Time	Paper Information	Submission ID
15:30-15:45	Static and Dynamic Voltage Balancing for an IGCT-Based Resonant DC Transformer <i>Renan Pillon Barcelos; Nikolina Djekanovic; Drazen Dujic</i>	16
15:45-16:00	Soft Switching Modulation Strategy for Modular Multilevel Solid-State Transformer with Integrated Switching Pairs <i>Yinyu Yan; Yichao Sun; Carlos Teixeira; Xiong Yang</i>	93
16:00-16:15	Versatile Methodology for Optimized Design of Galvanically Isolated Modular DC-DC Converters <i>Tim Karsten; Katharina Hetzenecker; Amandus Bach; Rik W. De Doncker</i>	232
16:15-16:30	Analysis and Compensation of the ZVS based Nonlinear Transfer Characteristic of a Dual Active Bridge <i>Fabian Sommer; Tobias Merz; Hongyi Sui; Rüdiger Schwendemann; Marc Hiller</i>	284
16:30-16:45	A Novel Five-Level LLC Converter for Medium-Voltage Applications and Its DC Capacitor Voltage Balancing Control <i>Xin Wu; Yi Zhou; Haihong Long; Yipeng Ren; Yujie Jiang; Dehong Xu</i>	558
16:45-17:00	Frequency Division Decoupling of Triple Active Bridge Converters with Asymmetric Duty Modulation <i>Shuyu Liu; Zheng Gong; Peng Dai</i>	812

Oral 34: Modern Control of Multi-Level/Multi-Phase Motor Drives		
Location: VIP Lounge (青羊厅) Time/Date: 15:30-17:00, May 19, Sunday Chairs: Shuai Xu, <i>Southwest Jiaotong University, China</i> Xueqing Wang, <i>Sichuan University, China</i>		
Time	Paper Information	Submission ID
15:30-15:45	Open-Circuit Fault Diagnosis for Three-Level ANPC Inverter Drives Using Improved 1D Convolutional Neural Network <i>Sijia Wu; Shuai Xu; Chunxing Yao; Guohua Li; Guangtong Ma</i>	402
15:45-16:00	Radial Basis Neural Network Optimization of Weight Factor for Model Predictive Control of LSLSM <i>Musen Li; Shuai Xu; Guohua Li; Chunxing Yao; Zhenyao Sun; Guangtong Ma</i>	417
16:00-16:15	Adaptive Fault-Tolerant Operation of Three-Level ANPC Inverter Using Model Predictive Control <i>Guohua Li; Shuai Xu; Chunxing Yao; Guanzhou Ren; Guangtong Ma</i>	508
16:15-16:30	Position Sensorless Control for PMSM Drives Without DC-Link Voltage Sensor <i>Shaowei Ren; Yifan Wang; Jichao Ma; Haibin Xie; Xinyu Yan; Xueqing Wang</i>	581
16:30-16:45	Computationally Efficient and Weighting Factorless Predictive Current Control of Three-Level PMSM Drives by Cost Function Division <i>Rao Atif; Chenwei Ma; Wensheng Song; Mannan Hassan; Cristian Garcia; Jose Rodriguez</i>	942
16:45-17:00	Predictive Control of Three-Level NPC Inverter-Fed IPMSM Drive Using g-h Coordinates for Common Mode Voltage Reduction <i>Mohsin Ihsan; Rao Atif; Shunfeng Yang; Muhammad Zahid Rafique; Muhammad Shahid Mastoi</i>	1001

Oral 35: Power Converters and Control (V)		
Location: Meeting Room 1 (琴台厅) Time/Date: 08:30-10:00, May 20, Monday Chairs: Zhenyu Shan, <i>Beihang University, China</i> Guanguan Zhang, <i>Shandong University, China</i>		
Time	Paper Information	Submission ID

08:30-08:45	An Improved Two-Step Commutation Method for Bidirectional Switch-Based Current Source Converter <i>Zihang Gu; Lei Ming; Yufeng Cao; Yubin Xue; Wei Yin; Zhen Xin</i>	824
08:45-09:00	High Robustness Control Strategy for Single Phase PMW Rectifiers <i>Huizhen Gao; Chengrui Li; Dianxun Xiao; Gaolin Wang; Dianguo Xu</i>	861
09:00-09:15	Development of Linearized Direct Power Control for Three-Phase Rectifiers under Unbalanced Power Grid <i>Yi-Hung Liao; Wei-Lun Kuo; Cheng-Wei Yeh; Jia-Sheng Liu</i>	865
09:15-09:30	Evaluation of Closed-loop Control Techniques for Single-stage MVAC-LVDC Solid-State-Transformers in Compact EV Ultra-Fast Charging Stations <i>Jaydeep Saha; Prasanth Sundararajan; Sanjib Kumar Panda</i>	50
09:30-09:45	Design and Implementation of a Half-Bridge Resonant Converter with Light Load Efficiency Improvement <i>Jia-Jen Yang; Tsong-Juu Liang; Kai-Hui Chen; Xue-Yi Chen</i>	875
09:45-10:00	Frequency Control Method for the Wide Load Range Operation of Fly-Buck Converter <i>Younghoon Cho; Paul Jang</i>	895

Oral 36: Reliability Improvement Techniques for Power Electronics System (I)

Location: Meeting Room 2 (故里厅) Time/Date: 08:30-10:00, May 20, Monday
Chairs: Chengmin Li, *Eindhoven University of Technology, Netherlands*
 Baohong Li, *Sichuan University, China*

Time	Paper Information	Submission ID
08:30-08:45	Comparative Study on Switching Oscillations of SiC MOSFETs Using Transfer Function and State-Space Model <i>Qianchen Yin; Helong Li; Zhiqing Yang; Shuang Zhao; Lijian Ding</i>	672
08:45-09:00	Research on Maximum Wave Energy Capture Strategy Based on Resembling Model Prediction <i>Shiquan Wu; Lei Huang; Jianlong Yang; Shixiang Wang; Zihao Mou</i>	869
09:00-09:15	Research on Novel Permanent Magnet Brushless Start/Generator System <i>Huang Qi; Luo Ling; Huang Liang</i>	554
09:15-09:30	Research on Efficiency Improvement Strategies for Energy Storage <i>Xiaoqiong He; Jie Meng</i>	867
09:30-09:45	Modeling, Analysis, and Reduction of In-chassis Radiated EMI in High-Power PV Inverter Based on 3D Electromagnetic Simulation <i>Yi Yu; Xuejun Pei; Zilu Zhang; Yaping Cai</i>	132
09:45-10:00	A Novel Identification Method for Dominant Radiated EMI Source in High-Power PV Inverter <i>Yi Yu; Xuejun Pei; Yaping Cai</i>	543

Oral 37: Solid-State DC Transformers for DC Transmission and Distribution Grids (II)

Location: Meeting Room 3 (鼓楼厅) Time/Date: 08:30-10:00, May 20, Monday
Chairs: Hao Tu, *Sichuan University, China*
 Reza Mirzadarani, *Delft University of Technology, Netherlands*

Time	Paper Information	Submission ID
08:30-08:45	Design Aspects of a Transformerless Solid-State Transformer Concept Considering Lightning Impulse Behavior <i>Daniel Neuner; Michael Hartmann</i>	836
08:45-09:00	Optimal Selection of High-Frequency Solid-State Transformer Topology for Dual Active Bridge Applications <i>Galina Demidova; Aleksandr Usolchev; Nikolai Poliakov; Dmitry Lukichev; Aleksandr Lukin; Alecksey Anuchin</i>	956
09:00-09:15	Soft Start-Up Scheme of Dual Active Half-Bridge Converter for Mitigating Dead Time Effects <i>Gun-su Kim; Hyeon-Sik Kim</i>	1066
09:15-09:30	Generic Method for Instantaneous Flux and Current Control of the Single-Phase and Multi-Phase Dual-Active Bridge <i>Daniel von den Hoff; Rik W. De Doncker</i>	1165
09:30-09:45	Short Time-scale Analysis of Dead-time Effect in Dual Active Half-Bridge Converter <i>Su-Bin Kang; Hyeon-Sik Kim</i>	1229
09:45-10:00	Model Predictive Control with Parameter Identification of DC-Transformer (DCX) in Class-D Audio Amplifier <i>Jiazheng Huang; Zheng Dong; Yulin Liu; Feng Jing; Jingdong Gao; Bing Zou; Hongzheng Liu; Tianqu Hao</i>	79

Oral 38: Advanced Modulation, Control and Topology of DC-DC Converters (II)

Location: Meeting Room 5 (南街厅) Time/Date: 08:30-10:00, May 20, Monday
Chairs: Petar J. Grbovic, *University of Innsbruck, Austria*
 Di Mou, *The Hong Kong Polytechnic University, China*

Time	Paper Information	Submission ID
08:30-08:45	A Study of Output Voltage Control without Current Sensor for DC-DC Converters with Rapid Load Variation <i>Taishi Nakajima; Kantaro Yoshimoto</i>	1032
08:45-09:00	Fixed Frequency Model Predictive Control of a Five-level Flying Capacitor Converters with Reduced Voltage Ripple <i>Yongxing Yang; Min Zhang; Ke Shen; Dan Zhao</i>	1072

09:00-09:15	A Review of Envelope Optimization Methods of the Soft-Switching Resonant Inverter <i>Yajing Zhang; Xinyu Ao; Xuecong Wei; Huanchen Zhang; Jianguo Li; Longyang Zhang; Hong Li</i>	1178
09:15-09:30	A Novel Trapezoidal Current Mode for Realizing Zero-Voltage Switching in Three-Level DC-DC Converters <i>Zhigang Yao; Xinyu He; Ziheng Xiao; Fei Deng; Weirong Chen; Yi Tang</i>	1194
09:30-09:45	New Phase Current Balancing Control for a Cryogenic Ultra-Low-Loss Bidirectional Multi-Phase Full-Bridge DC-DC Step-Down Converter <i>Mücahid Akbas; Daifei Zhang; Johann Kolar; Jonas Huber</i>	1200
09:45-10:00	3-Bridge LLC DC-DC Converter with Notch Filter for Wide Output Voltage Control <i>Kyung su Park; Taeran Kim; EunSoo Kim; Yong-Seog Jeon</i>	1207
Oral 39: EV Charging Technologies and Batteries		
Location: Meeting Room 6 (宽巷厅) Time/Date: 08:30-10:00, May 20, Monday Chairs: Zian Qin, <i>Delft University of Technology, Netherlands</i> Lei Zhang, <i>Beijing Institute of Technology, China</i>		
Time	Paper Information	Submission ID
08:30-08:45	A New Bidirectional Three Port DC-DC Converter for Dual Auxiliary Voltage in EV Application <i>Huu-Phuc Kieu; Ngoc-Quy Do; Sewan Choi</i>	456
08:45-09:00	Single-Phase and Three-Phase Compatible Single-Stage OBC with 6-Switches Secondary Side <i>Ba Phu Do; Million Gerado Geda; Jisoo Yun; Kunwoo Kang; Seungheon Lee; Choi Sewan</i>	465
09:00-09:15	Li-Ion Battery Fast Charging Methods: Review and Comparison <i>Reyyan Ahmad Khan; Grbović Petar; Giuseppe DeFalco; Roberto Petrella</i>	1249
09:15-09:30	Feature Extraction from Electrochemical Impedance Spectroscopy for State of Health Estimation of Lithium-Ion Batteries Under Different Temperatures <i>Ruijun Liu; Dayu Zhang; Zhengzhao Li; Pavol Bauer; Zian Qin</i>	847
09:30-09:45	Power Decoupling Integrated Single-Stage OBC for DC Charging <i>Sunju Kim; Million Gerado Geda; Kihoon Kim; Sewan Choi</i>	976
09:45-10:00	Lithium-ion Battery Application Time Series Data Augmentation Based on Generative Adversarial Network for Training Deep Learning Algorithm <i>Miyounng Lee; Jonghoon Kim</i>	1082

Oral 40: Advanced Modeling, Control Strategy, and Operations Management of AC/DC Microgrids		
Location: Meeting Room 7 (窄巷厅) Time/Date: 08:30-10:00, May 20, Monday Chairs: Yang Han, <i>University of Electronic Science and Technology of China, China</i> Yajuan Guan, <i>Aalborg University, Denmark</i>		
Time	Paper Information	Submission ID
08:30-08:45	Voltage Cooperative Control Technology for Flexible Interconnected Distribution Network <i>Tao Li; Jianqiao Zhou; Bing Han; Jianwen Zhang; Gang Shi; Dongmin Xi; Jiajie Zang; Linlin Chu; Xin Yu</i>	172
08:45-09:00	Hierarchical Control Strategy for Islanded Microgrids Based on Event-Triggered Mechanism <i>Chaofeng Yan; Yang Han; Ping Yang; Congling Wang</i>	326
09:00-09:15	Fixed-Time Observer Based Integral Sliding Mode Control Design for Microgrids Feeding Constant Power Loads <i>Nikhil Tyagi; Pragya Nand Singh; Srinivas Bhaskar Karanki</i>	383
09:15-09:30	Brain Amygdala Modelling for Microgrid Control and Protection <i>Jorge De La Cruz; Najmeh Bazmohammadi; Juan C. Vasquez; Josep M. Guerrero</i>	412
09:30-09:45	Power-Voltage Curves Calculation via Numerical Continuation for Droop-Based Islanded Microgrids Including Storage Systems <i>Gibran David Agundis Tinajero; Juan Carlos Vasquez Quintero</i>	549
09:45-10:00	Consensus Check in the Detection of Faulty and Hijacking Attacks for Multiple Converter-based Microgrids <i>Sen Tan; Peilin Xie; Juan Vasquez; Josep Guerrero</i>	588
Oral 41: Fractional-Order and Emerging Power Electronics Technology in New Energy Vehicles and Aircraft		
Location: Meeting Room 9 (金沙厅) Time/Date: 08:30-10:00, May 20, Monday Chairs: Liangzong He, <i>Xiamen University, China</i> Fengxiang Wang, <i>Chinese Academy of Sciences (Quanzhou Institute of IEquipment Manufacturing Haixi Institutes), China</i>		
Time	Paper Information	Submission ID
08:30-08:45	Low-Frequency Current Ripple Reduction Control Method Based on Fractional-Order Inductor and Fractional-Order Capacitor <i>Hongyan Zhou; Liangzong He</i>	356
08:45-09:00	High-Performance Model-Free Predictive Control for PMSM Drives with Current Sensor Faults <i>Yao Wei; Haotian Xie; Hector Young; Fengxiang Wang; S. Alireza Davari; Cristian Garcia; Jose Rodriguez</i>	445

09:00-09:15	Power Loss Analysis of Two-Level and Three-Level Converters under Active Short-Circuit Operating Conditions for Multi-Lane Electric Aviation Applications <i>Wei Wang; Jonas Kristiansen Nøland; Pål Keim Olsen</i>	482
09:15-09:30	Parameter Identification Method of DC-DC Converter Based on Neural Network <i>Liangzong He; Miaoling Yang; Jinagyu Zhang; Hongyan Zhou</i>	563
09:30-09:45	Fractional-order Disturbance Observer based Secondary Frequency Control for Power Systems with Battery Energy Storage <i>Sheng Yang; Leijun Xiang; Jiansheng Wu; Yu Chen</i>	642
09:45-10:00	Adaptive Fractional-Order Impedance for Current Balancing Control <i>Zihang Cheng; Liangzong He</i>	978
Oral 42: Intelligent Battery Management		
Location: Meeting Room 10 (文翁厅) Time/Date: 08:30-10:00, May 20, Monday Chairs: Yunhong Che, <i>Aalborg University, Denmark</i> Xiaosong Hu, <i>Chongqing University, China</i>		
Time	Paper Information	Submission ID
08:30-08:45	Communication and Equalization Strategy in Distributed Series-Connected Battery String Based on Talkative Power Converter <i>Ke Chen; Keming Liu; Kaihui Tang; Jiande Wu; Xiangning He</i>	181
08:45-09:00	Graph Convolutional Networks for Lithium-ion Battery Health Estimation <i>Yixin He; Zhongwei Deng; Wenhao Nie; Chunlin Jiang</i>	407
09:00-09:15	Early Prediction of Lithium Battery Knee Point before Capacity Degradation <i>Yongjiang Yu; Shunfeng Yang; Yi Luo; Xin Qi; Yujia Miao</i>	657
09:15-09:30	Connected Hybrid Electric Vehicles with Policy-Sharing: A Combination of Deep Reinforcement Learning and Federated Learning <i>Arash Khalatbarisoltani; Jie Han</i>	1019
09:30-09:45	Online Multi-fault Detection and Isolation for Battery Systems using Improved Model-based and Signal Processing Methods <i>Kai Zhang; Xiaosong Hu; Arash Khalatbarisoltani</i>	1124
09:45-10:00	Combing Physics-based Thermal Model and Machine Learning for Battery Temperature Estimation: The Impact of Model Accuracy <i>Yusheng Zheng; Yunhong Che; Xin Sui; Remus Teodorescu</i>	1205

Oral 43: Advanced Control of AC Motor Drives (I)		
Location: Meeting Room 11 (石室厅) Time/Date: 08:30-10:00, May 20, Monday Chairs: Yanqing Zhang, <i>Xi'an University of Technology, China</i> Lin Qiu, <i>Zhejiang University, China</i>		
Time	Paper Information	Submission ID
08:30-08:45	Analysis and Compensation of Position Estimation Errors in Zero-Sequence BEMF-Based Sensorless Method for OW-PMSM <i>Wenhao Han; Hanlin Zhan; Licheng Zheng; Sifan Qian; Dianguo Xu</i>	73
08:45-09:00	BLDC Motor Zero-Speed Startup Position Sensorless FOC Control <i>Nicholas Wei Jian Chiang; Shuyu Cao; King Jet Tseng; Liang Boon Wee; Shan Yin</i>	306
09:00-09:15	Identification of Rotor Position and Current Dependent Flux Linkage Maps for EESMs <i>Stephan Goehner; Johannes Stoss; Matthias Brodatzki; Benjamin Bachowsky; Andreas Liske; Johannes Kolb; Marc Hiller</i>	488
09:15-09:30	A Novel Five-Level Power Converter Structure with Reduced Device Utilization for SRM <i>Lefe Ge; Yuyang Shen; Nan Du; Shoujun Song; Jose Rodriguez</i>	586
09:30-09:45	An Enhanced Deadbeat Predictive Current Control for High-Speed PMSM Drives <i>Yilin Wang; Zhen Li; Shichang Zhou; Yimin Zhang; Jin Zhang; Haitao Li; Jose Rodriguez; Zhenbin Zhang</i>	693
09:45-10:00	Full Order Observer-based LQR Position Servo Controller <i>Chunqiang Liu; Ming Sun; Ziteng Li; Xinming Zhou; Xuechao Duan</i>	545
Oral 44: Reliability, Diagnosis, Prognosis and Testing of Power Electronics		
Location: Board Room (董事会议室) Time/Date: 08:30-10:00, May 20, Monday Chairs: Yi Zhang, <i>Aalborg University, Denmark</i> Keiji Wada, <i>Tokyo Metropolitan University, Japan</i>		
Time	Paper Information	Submission ID
08:30-08:45	Condition Monitoring the Inhomogeneous Thermal Fatigue of Multi-chip IGBT Module Based on the Natural Frequency of Thermal Network <i>Jun Zhang; Huixian Shen; Pengju Sun; Xing Ma</i>	668
08:45-09:00	Self-Stability Analysis of Dual-Frequency Band Grid Impedance Emulator <i>Weiyu Tang; Ke Ma; Jiashi Wang</i>	701

09:00-09:15	A Study of Thermal Impedance Matrix Characterization of IGBT Module Based on TSEP <i>Yichi Zhang; Yi Zhang; Zhiliang Xu; Huai Wang</i>	969
09:15-09:30	Impedance Modeling and Optimization Method for Inductor Based on Information Criterion <i>Runquan Jiang; Yi Yu; Xuejun Pei</i>	1060
09:30-09:45	Eigenvector of Gram-Matrix based Fault Diagnosis Method for Three Phase Inverter <i>Yang Zhou; Jin Zhao; Yang Liu; Lijun Sun</i>	1077
09:45-10:00	Online Monitoring System of Power Semiconductor Devices Based on Frequency Domain Thermal Impedance and On-State Voltage Drop <i>Shuangzhe Chen; Siyu Cao; Ke Ma</i>	1123

Oral 45: Power Electronic Equipment for Distribution System Reliability Enhancement (I)

Location: VIP Lounge (青羊厅) Time/Date: 08:30-10:00, May 20, Monday
Chairs: Wen Wang, Changsha University of Science & Technology, China
 Qingsong Wang, Southeast University, China

Time	Paper Information	Submission ID
08:30-08:45	Comprehensive Fault Current Limiting Control for Isolated Modular Multilevel DC Transformer <i>Xingyu Hou; Jinmu Lai; Lianghui Dong; Zhenlan Dou; Yaoqiang Wang</i>	199
08:45-09:00	Breaker-Less MVDC Grid with Single-Phase Dual-Active Bridge <i>Raphael Mencher; Jan Mathé; Rik W. De Doncker</i>	247
09:00-09:15	High-frequency isolated hybrid distribution transformer based on model predictive control <i>Ruifeng Li; Chuang Liu; Dongbo Guo; Shuo Gao; Qinghai Yu; Tingrui Mao</i>	252
09:15-09:30	Wide Frequency Range Control Strategy of Modular Multilevel Matrix Converter based on FCS-MPC <i>Zhen Yang; Zheng Gong; Chongwen Liu; Lianchang Zhang</i>	265
09:30-09:45	Development of Smart Operation and Maintenance Platform for Distributed Large-scale Battery Energy Storage Power Stations Based on Cloud Edge Collaboration <i>Guoqing Li; Jiahui Zhao; Mingyi Liu; Guohui Zhang; Dawei Liu; Yong Zhu; Sheng Yong; Jianxing Wang; Wei Zhang; Sheng Lin; Chenghao Liu; Yue Sun; Hao Jing; Chuazhao Cao; Xi Cao; Jie Pei; Yaoyu Li; Ye Qin; Jiangjiang Jin; Min Zhang</i>	27

Oral 46: Power Converters and Control (VI)

Location: Meeting Room 1 (琴台厅) Time/Date: 10:30-12:00, May 20, Monday
Chairs: Dong-Choon Lee, Yeungnam University, South Korea
 Lei Zhang, Nanyang Technological University, Singapore

Time	Paper Information	Submission ID
10:30-10:45	Design & Control of DC-DC Converter for Fuel-Cell Hybrid Power System of the UAV <i>Mingwan Gwon; Jongmin Cheon; Kichang Lee</i>	903
10:45-11:00	Design of High Power Density for High Step-Down Ratio Low Voltage High Current LLC-TLVR DC-DC Converter <i>Hongyu Zhang; Xiangjun Zhang; Xiaohan Zhang; Yueshi Guan; Yijie Wang; Dianguo Xu</i>	370
11:00-11:15	Resonant ZVZCS Buck Converter for Wireless Electric Vehicle Charging System <i>Jae Joon Kim; Sin Su kyong; Eun Soo Lee</i>	921
11:15-11:30	Dynamic Behavior of Isolated DC-DC Converter Based on Bidirectional Switches <i>Yamato Kamiyama; Makoto Hagiwara</i>	964
11:30-11:45	Power Decoupling Method for Droop Control Inverters Based on Voltage Compensation <i>Pengcheng Wang; Jianyu Bao; Cheng Yan; Jiahui Wang; Feng Jiang; Min Chen</i>	1117
11:45-12:00	Designing Series-capacitor Quadratic Buck Converter <i>Guanlin Li; Xiaoyang Guo; Fangyuan Xiong; Xiyu Chen; Mahshid Amirabadi; Brad Lehman</i>	1203

Oral 47: Topologies, Control and Applications of Multilevel Converters

Location: Meeting Room 2 (故里厅) Time/Date: 10:30-12:00, May 20, Monday
Chairs: Kui Wang, Tsinghua University, China
 Yong Yang, Soochow University, China

Time	Paper Information	Submission ID
10:30-10:45	Bilateral Common-mode Voltage Injection Method with Minimized Low-frequency Ripple Buffering of AC/AC Solid-State Transformer <i>Zhenchao Li; Yan Zhang; Ziyin Wang; Jinjun Liu; Ziyue Ji</i>	21
10:45-11:00	Optimized Design of Three-Level APF Voltage Loop Considering DC-Link Voltage Oscillations <i>Qingzeng Yan; Longzhen Guo; Zixu Zhang; Chengjian Xing; Jinkui He</i>	338

11:00-11:15	A Suppression Method For Inrush Current And Oscillation In Hybrid Three-Level ANPC With A Decoupling Capacitor <i>Hao Chen; Weimin Wu; Dong Xu; Henry Chung; Frede Blaabjerg; Mohamed Orabi; Liang Yuan</i>	185
11:15-11:30	Volume and Power Loss Optimization Tool for N-level Half-bridge Sub-module Modular Multilevel Converters with Filter Inclusion Assessment Capabilities <i>Kesheng Wang; Ian Laird; David Barton</i>	604
11:30-11:45	A New Two-level Hybrid Modular Multilevel Converter <i>Hao Liu; Shunfeng Yang; Haobo Sun</i>	687
11:45-12:00	A Dual-Phase-Shift Control Method for MMC-H Solid State Transformer with Current Stress Suppression Effect <i>Yihao Du; Weixing Tong; Kai Xiao; Yansheng Zou; Wenqi Lin; Jianyu Pan</i>	767

Oral 48: Safety and Reliability of Passive Components and Energy Storage Systems

Location: Meeting Room 3 (鼓楼厅) Time/Date: 10:30-12:00, May 20, Monday

Chairs: Huai Wang, *Aalborg University, Denmark*
Zhaoyang Zhao, *Southwest Jiaotong University, China*

Time	Paper Information	Submission ID
10:30-10:45	A Hardware-in-loop test platform for BMS in the energy storage system based on an Extended Single Particle model <i>Botao Hu; Xiangtian Deng; Jing V. Wang; Qian Wang; Jianqiang Kang; Guorong Zhu</i>	360
10:45-11:00	Reliability Improvement of MMC in Energy Storage System Using ANN-based Capacitor Voltage Estimation <i>Yantao Liao; Long jin; Jun You; Zhike Xu; Kaiyuan Liu; Shunshun Ma; Miaoyu Huang; Hongbin Zhang; Zhan Shen; Fujin Deng</i>	866
11:00-11:15	Synthetic Reliability Evaluation framework of Three-Port Hybrid AC/DC/DS Microgrids <i>Qingzuo Meng; Pengfeng Lin; Chen Yang; Xiaofeng Dong; Pengfei Tu; Miao Zhu; Peng Wang</i>	130
11:15-11:30	A Physics-Informed Neural Network Method for LC Parameter Estimation in Three-Phase Inverter <i>Jie Kong; Dao Zhou; Xing Wei; Huai Wang</i>	982
11:30-11:45	A Robust Data-driven Fault Diagnosis Framework for Traction Dual Rectifiers <i>Qingli Deng; Bin Gou; Shuai Zhao; Dong Xie; Xiaoyun Feng; Huai Wang</i>	1101
11:45-12:00	FEM-based aging modeling of Al-Caps with the consideration of electrolyte changes <i>Siyi Zhu; Zhaoyang Zhao</i>	1121

Oral 49: Artificial Intelligence and Advanced Technologies for Power Electronic Applications

Location: Meeting Room 5 (南街厅) Time/Date: 10:30-12:00, May 20, Monday

Chairs: Chenwei Ma, *Southwest Jiaotong University, China*
Huayu Li, *Naval University of Engineering, China*

Time	Paper Information	Submission ID
10:30-10:45	An Online Torque Sharing Function Method for Low Torque Ripple and Copper Losses in Switched Reluctance Motors <i>Xuliang Yao; Hai He; Jingfang Wang; Qi Guan</i>	485
10:45-11:00	Emulation-Aimed Design of Model Fitting Methods for Grid-connected Inverters <i>Yuqi Dai; Wanjun Lei; Haixu Wang; Hongyi Zhou</i>	703
11:00-11:15	A Robust Model Predictive Direct Speed Control with Improved Cost Function <i>Junchao Bai; Xuliang Yao; Jingfang Wang; Guowang Zhang</i>	704
11:15-11:30	Digital Twin Approach for Parameters Monitoring of a Three-Phase Three-Level ANPC Inverter <i>Zhiwei Zhang; Sihui Zhang; Yuchao Zou; Cunxin Ye; Chenwei Ma; Wensheng Song</i>	782
11:30-11:45	Multi-Output Physical-Informed Neural Networks Based Impedance Identification of Buck Converter in More Electric Aircraft Power Systems <i>Yujia Cao; Min Zhang; Ke Shen; Dan Zhao</i>	1092
11:45-12:00	Voltage Injection-Based Fault Diagnosis for Power Devices with Multi-Module Neural Networks <i>Minha Kim; Jeonghwan Kim; Jonghyun Shin; Jaehoon Shim; Jung-Ik Ha</i>	1140

Oral 50: Reliability Improvement Techniques for Power Electronics System (II)

Location: Meeting Room 6 (宽巷厅) Time/Date: 10:30-12:00, May 20, Monday

Chairs: Sanjay Chaudhary, *Aalborg University, Denmark*
Jingfang Wang, *Harbin Engineering University, China*

Time	Paper Information	Submission ID
10:30-10:45	Compensated Power Sensor for Semiconductor Switching Loss Measurement <i>Zach Mike; Szymon Beczkowski; Asger Bjørn Jørgensen; Stig Munk-Nielsen</i>	104
10:45-11:00	Application and Benefit Analysis of Guard Ring Methods in Reducing the Maximum Electric Field of Half Bridge Power Module <i>Yuan Gao; Stig Munk-Nielsen; Hongbo Zhao; Stefan Meyer; Thore Stig Aunsborg</i>	1085

11:00-11:15	Series Voltage Compensation Circuit for Pulsed Power Suppression <i>Zuoqian Zhang; Xin Jin; Haitao Yu; Linwei Xie; Fengfu Yang; Yan Xing; Hongfei Wu</i>	713
11:15-11:30	A Purely Decentralized Control System Based on Cascaded Power Electronic Traction Transformer <i>Jiaxuan Niu; Xu Yang; Haonan Li; Keliang Chen; Kexin Zhao; Wenjie Chen</i>	918
11:30-11:45	Fixed-Switching Frequency Model Predictive Current Control: Closed-Form Solution in the Stationary Reference Frame <i>Erik Colavitto; Riccardo Breda; Sandro Calligaro; Daniele Casagrande; Roberto Petrella</i>	1215
11:45-12:00	Optimal Configuration of energy storage in weak grid based on intelligent optimization algorithm <i>Yurui Zhou; Pengfeng Lin; Caizhi Zhang; Shuli Wen; Miao Zhu</i>	174

Oral 51: Advanced Control of AC Motor Drives (II)

Location: Meeting Room 7 (窄巷厅) Time/Date: 10:30-12:00, May 20, Monday

Chairs: Li Zhang, *Jiangsu University, China*
Guoqiang Zhang, *Harbin Institute of Technology, China*

Time	Paper Information	Submission ID
10:30-10:45	Improved Modulated MPC Technique using the Virtual Vectors by Duty Cycle Reconstruction <i>Zhen Huang; Qiang Wei; Tingfeng Wu; Yonghong Xia</i>	742
10:45-11:00	Dead-beat Predictive Current Control for Permanent-Magnet Synchronous Motor Drives Considering Parameter Mismatch <i>Yuanhang Cao; Xiaoguang Zhang; Tianyu Yuan</i>	858
11:00-11:15	Performance and Analysis of Random Carrier Pattern SVPWM With Fixed Carrier Frequency <i>Peiran Zhang; Shanming Wang</i>	872
11:15-11:30	Random-Phase Signal Injection Combined With Random PWM for Low-Noise IPMSM Sensorless Drives <i>Peiran Zhang; Shanming Wang</i>	881
11:30-11:45	Sensorless Accuracy Improvement Strategy for Electrolytic Capacitorless Drivers Based on Frequency Adaptive Notch Filter <i>Yuehan Li; Zhonggang Yin; Yanqing Zhang; Dongsheng Yuan; Fengtao Gao</i>	915
11:45-12:00	The operation stability of induction motor is improved under low speed power generation condition <i>Yanping Zhang; Ke Feng; Zhonggang Yin; Yanqing Zhang; Cong Bai</i>	957

Oral 52: Power Electronic Equipment for Distribution System Reliability Enhancement (II)

Location: Meeting Room 9 (金沙厅) Time/Date: 10:30-12:00, May 20, Monday

Chairs: Chuan Xie, *University of Electronic Science and Technology of China, China*
Zheng Gong, *China University of Mining and Technology, China*

Time	Paper Information	Submission ID
10:30-10:45	Analysis and Suppression of Voltage Overshoot in Symmetrical Hybrid Five-level Converter <i>Nianzhou Liu; Mingqi Zhang; Jupeng Pang; Pengfei Xie; Changqing Qiu; Kui Wang; Yongdong Li</i>	1010
10:45-11:00	Fault Diagnosis Method with Improved Space-Channel Attention Mechanism Based on BiGRU <i>Jianye Li; Lin Zhang; Pengcheng Song; Ming Yang</i>	566
11:00-11:15	Arc Suppression Method Based on Modular Multilevel Converter in Distribution Network <i>Junjie Li; Wen Wang; Chaofeng Zhang; Yuxuan Tong; Muye Chen; Da Wang</i>	346
11:15-11:30	Deep reinforcement learning based power flow control for triple active bridge converter <i>Hang Ren; Yanbo Wang; Haoyuan Yu; Bin Zhang; Zhe Chen</i>	524
11:30-11:45	Grid Impedance Detection Based on Resonance Characteristics of LCL Filter for Energy Storage System <i>Hanxin Zhang; Wenli Yao; Da Kang; Yuheng Bu; Xikui Yu</i>	931
11:45-12:00	Grid Impedance Estimation and Decoupling through a Series-Parallel Direct-Injection Soft Open Point <i>Mowei Lu; Wei Mu; Mengjie Qin; Jingyang Fang; Stefan Goetz</i>	1214

Oral 53: Transient Support Technique For Grid-forming Converters

Location: Meeting Room 10 (文翁厅) Time/Date: 10:30-12:00, May 20, Monday

Chairs: Zhen Tian, *Wuhan University, China*
Yang Wang, *Sichuan University, China*

Time	Paper Information	Submission ID
10:30-10:45	Reactive Power Sharing and Stability of Islanded Microgrid Using Centralized Secondary Control <i>Jingxi Yang; Chao Charles Liu; Chi K. Tse</i>	635
10:45-11:00	Comparison of the Performance of Grid-Forming Converters with Different Combinations of Control Methods and Current Limiters <i>Tianyi Xu; Shan Jiang; Georgios Konstantinou</i>	823

11:00-11:15	Third-order Energy Function Modelling Approach for Grid-Forming Converters <i>Shilong Tang; Xikun Fu; Zhen Tian; Meng Huang; Wei Wang; Shaoze Zhou</i>	997
11:15-11:30	Inertial-Response Preserved Active Damping of Grid-Forming Voltage-Source Converters Using Fractional-Order Regulators <i>Yun Yu; Jingxuan Wu; Wenfa Kang; Juan C. Vasquez; Josep M. Guerrero; Yajuan Guan</i>	292
11:30-11:45	Grid Impedance Shaping for Grid-Forming Inverters: A Soft Actor-Critic Deep Reinforcement Learning Algorithm <i>Arman Oshnoei; Hoda Sorouri; Soroush Oshnoei; Remus Teodorescu; Frede Blaabjerg</i>	1202
11:45-12:00	Control Strategy of Grid Forming MMC system for Grid Voltage Sag Ride Through <i>Zeming Wang; Jianzhong Zhang; Xu Huang; Fujin Deng</i>	276
Oral 54: Emerging Techniques in Multilevel Converters		
Location: Meeting Room 11 (石室厅) Time/Date: 10:30-12:00, May 20, Monday Chairs: Jianyu Pan, <i>Chongqing University, China</i> Mingzhe Wu, <i>China University of Mining and Technology (Beijing), China</i>		
Time	Paper Information	Submission ID
10:30-10:45	Hybrid Phase-Shift Modulation Strategy for Dual Active Bridge Converters to Improve Full Power Range Efficiency <i>Shusong Liu; Mixin Wang; Yalong Li; Bo Qu; Fan Liu; Sijie Li; Ping Yang</i>	750
10:45-11:00	Fault-Tolerant Control of Dual-Three-Phase PMSM under Open-Phase Fault Based on Two-Individual Current Control <i>Lei Chen; Bodong Li; Xinnan Sun; Feng Jiang; Min Chen</i>	1036
11:00-11:15	Asymmetric Modulated Predictive Current Control for Dual Three-Phase PMSM With Improved Performance <i>Ze Li; Xingyu Zheng; Jinhui Xia; Hangan Liu; Xiaonan Gao; Jose Rodriguez; Liling Wang; Zhaoyan Zhang; Zhiheng Liu</i>	1169
11:15-11:30	Fixed-frequency Dual PWM Interleaved Boost LLC Resonant Converter for A Wide Input Voltage for Photovoltaic Applications <i>Yu Zuo; Xiaobing Shen; Bangli Du; Diego Bernal Cobaleda; Hans Wouters; Wilmar Martinez</i>	1031
11:30-11:45	Direct AC/AC voltage regulator using a 2-level modulated cascaded H-bridges converter <i>Rui Wang; Henk Huisman; Maurice Roes</i>	1201
11:45-12:00	A simple 24-pulse rectifier combing isolated Y-type transformer and current injection circuit <i>Jianhua Wang; Wenyi Zhang; Jingfang Wang</i>	371

Oral 55: Advanced Power Converters for Power Electronics System		
Location: Board Room (董事会议室) Time/Date: 10:30-12:00, May 20, Monday Chairs: Tiesheng Yan, <i>Xihua University, China</i> Yajing Zhang, <i>Beijing Information Science and Technology University, China</i>		
Time	Paper Information	Submission ID
10:30-10:45	Online Expansion Strategy for Islanded AC Microgrid Based on Short-term Harmonic Injection Without Communication Lines <i>Ya Wen; Xiao Zhang; Zhenxiong Wang; Qiru Li; Hao Yi; Fang Zhuo</i>	298
10:45-11:00	A Dead-Time-Effect Elimination DPWM with High Efficiencies and Low Harmonics <i>Qingzeng Yan; Zixu Zhang; Longzhen Guo; Yanyan Qin; Longlong Zhang</i>	309
11:00-11:15	Novel Single-Stage Isolated Natural Ohmic Mains Behaviour Fixed Voltage Transfer Ratio Three-Phase Rectifier using Monolithic Bidirectional 600 V GaN Transistors <i>Sven Weihe; David Menzi; Jonas Huber; Johann Walter Kolar</i>	1136
11:15-11:30	Research on Phase-Shifted Full-Bridge ZVS DC-DC Converter with Multi-pulsed Load <i>Samson Legesse Mekonnen; Gongrui Yang; Bo Qu; Yusheng Peng; Mohammad Hamed Patmal; Ping Yang</i>	1079
11:30-11:45	800V/48V/12V 6kW resonant dc-dc converter with dual transformers for Electric Vehicles <i>Ngoc-Quy Do; Changseop Lee; Jinhak Kim; Huu-Phuc Kieu; Sewan Choi</i>	480
11:45-12:00	Digital Control Implementation for Coupling Independent IPT Systems without Communication <i>Linhua Lai; Jiasheng Huang; Junfei Tang; Ziwei Ouyang; Yujing Liu; Michael A. E. Andersen</i>	838
Oral 56: Emerging Technologies for Power System		
Location: VIP Lounge (青羊厅) Time/Date: 10:30-12:00, May 20, Monday Chairs: Yonghui Liu, <i>Xi'an Jiaotong University, China</i> Gibrán David Agundis Tinajero, <i>Aalborg University, Denmark</i>		
Time	Paper Information	Submission ID
10:30-10:45	Lithium-ion Battery Health Estimation Using DCNN Paralleled LSTM-Self Attention Networks <i>Longhan Zhang; Xinrong Huang; Yuanyuan Li; Jinhao Meng; Wenjie Liu; Yipu Zhang</i>	764
10:45-11:00	An Overview of Early Warning and Prediction Methods for Lithium-ion Battery Thermal Runaway <i>Yijing Li; Kun Zheng; Zhengxiang Song; Kun Yang; Jinhao Meng</i>	832

11:00-11:15	Intelligent Cell Balancing Control For Lithium-Ion Battery Packs <i>Hoda Sorouri; Arman Oshnoei; Remus Teodorescu</i>	989
11:15-11:30	A Study on Communication Impact in the Excitation Signal Chain of a 3-phase Synchronous Generator <i>In Kwon Park; Dinesh Gurusinghe; Seongil Kim; Yi Zhang</i>	609
11:30-11:45	Hierarchical Operation Management System for Mobile Ad-hoc Microgrids in Emergency Events <i>Yajuan Guan; Wenfa Kang; Juan C. Vasquez; Francisco Danang Wijaya; Niken Arumdati; Adam Priyo Perdana; Zheng Grace Ma; Josep M. Guerrero</i>	695
11:45-12:00	Dynamic and Coordinated Control of a DC Microgrid Integrated with High-Temperature PEM Fuel Cell and High-Percentage of Renewable Energy <i>Peilin Xie; Sen Tan; Vincenzo Liso; Simon Lennart Sahlin</i>	1210

Poster Presentation A

Poster Presentation A		
Time/Date: 17:10-18:10, May 18, Saturday Location: Poster Presentation Area (Ballroom Foyer 宴会序厅)		
Chairs		Yanbo Wang Aalborg University, Denmark
		Xinglai Ge Southwest Jiaotong University, China
Poster No.	Submission ID	Paper Information
P-A-1	5	Design of a Rapid Control Prototype System for Permanent Magnet Synchronous Motor Based on SimulLab <i>Jie Jing; Jianfeng Zhang</i>
P-A-2	7	Smooth Structure Transfiguration Methodology for Half- and Full-Bridge LLC Resonant Converter via State Plane Approach <i>Jiahao Li; Jie Chen; Jingke Cai; Yong Wang</i>
P-A-3	9	Advanced Asymmetrical Switching Sequences Based Model Predictive Control with Minimum Current THD for Single-Phase NPC Rectifiers <i>Zhikang Guo; Weifeng Zhang; Zang Ling; Zhaoxun Li; Jingwei Zhang; Guojun Tan</i>
P-A-4	13	Modeling and Optimization of Film Capacitor for Motor Controllers Considering the Distribution of Internal Loss <i>Kaining Kuang; Xinhua Guo; Xiuwan Li; Chunzhen Li</i>
P-A-5	14	Optimized Design the Shell of Film Capacitor Used in Controller Considering Surface Roughness <i>Kaining Kuang; Xinhua Guo; Xiuwan Li; Chunzhen Li</i>
P-A-6	17	Circulating Current Mitigation in IGBT-based Master-Slave centralized Inverters <i>Liangjie Liu; Prashant Jain; Bin Liu; Qingwei Zhu; Zechun Dou; Yu Qi; Chengxi Li</i>
P-A-7	18	Review of research status of efficient gas cooling technology for motors <i>Shanshan Yang; Chuang Liu; Zhou Zhou; Xuezhong Zhu</i>
P-A-8	22	Online Data-driven Fault Detection for the HTPM Fuel Cells based on EIS: Equivalent Electrical Circuit Model Analysis <i>Dan Yu; Xingjun Li; Samuel Simon Araya; Simon Lennart Sahlin; Vincenzo Liso</i>
P-A-9	25	Research on the identification method of travelling wave reflection signal aliasing for IGBT fault feature extraction <i>Weiyu Yuan; Shu Cheng; Chang Liu; Chaoqun Xiang; Wangyu Xie; Weijie Wang</i>
P-A-10	28	Wide Output Range PWM Controlled Dual Resonant Capacitor LLC Resonant Convert <i>Sihong Li; Caixue Chen; Zongyuan Liu; Yikun Liu; Ziyi Luo; Fanming Liu</i>
P-A-11	32	A Fast Calculation Method Of IGBT Junction Temperature <i>Haitao Liu; Jie Liu; Shunmeng Xie; Yu Qi</i>
P-A-12	33	Study of Voltage Feedforward Damping Control Strategy for Grid-Connected Inverters Operating in Weak Grid Conditions <i>Chaoran Zhuo; Weizhang Song; Hao Yi</i>
P-A-13	35	The Impedance Reconstruction Strategy Based on Machine-Side Converter for SSO Suppression in PMSG Wind Generator <i>Ruixun Ma; Meng Li; Xueguang Zhang</i>
P-A-14	37	Switching Effects from External Anti-Parallel 10kV SiC JBS Diode <i>Benjamin Futtrup Kjærsgaard; Zhixing Yan; Dipen Narandra Dalal; Jannick Kjær Jørgensen; Szymon Beczkowski; Michael Møller Bech; Christian Uhrenfeldt; Hongbo Zhao; Stig Munk-Nielsen</i>



P-A-15	39	A Model Predictive Control Strategy with Virtual Vectors Visualization Analysis for Grid-Connected Converter <i>Nan Jin; Zhengwei Wang; Zifan Xu; Leilei Guo</i>
P-A-16	40	A Rapid Multi-Area Load Frequency Control Method Involving Thermostatically Controlled Loads <i>Li Li; Mi Dong</i>
P-A-17	41	A 40kW, 100-1000V Output DC/DC Unit Power Module for EV Fast Chargers <i>Se-Young Bae; Dal-Hyeon Jo; Min-Ki Choi; Jeong-Won Yeom; Gwang-Sik Yun; Jue-Un Kim; Il-Oun Lee</i>
P-A-18	42	Selective Inertia Response Control of Self-synchronous Voltage Source Doubly-fed Wind Turbines in the Whole Wind Speed Range <i>Siyang Xu; Han Wang; Yunfeng Cao; Seiki Igarashi; Jun Li; Xu Cai</i>
P-A-19	43	Model Predictive Current Control of Four-Level Inverter and Modulation With Two Capacitors <i>Yiyuan Zhang; Bihua Hu; Xiaoxue Luo; Xiangyun Qin; Zhenwen Xiao</i>
P-A-20	44	Fault Diagnosis Method with Feature Fusion Module Based on BiLSTM <i>Jianye Li; Lin Zhang; Pengcheng Song; Ming Yang</i>
P-A-21	45	Comparative study of fractional PI control permanent magnet synchronous motor speed control system based on orthopedic dynamic system <i>Xuesong Fu</i>
P-A-22	47	A Parallel-Connection Voltage Equalizer With A Shadow Fault Detection Method <i>Xue Wang; Huiqing Wen; Peichao Xu</i>
P-A-23	48	A Full-ANN Control Scheme of Single-Phase Grid-Connected Inverter <i>Kaizhe Nie; Feng Gao; Tao Xu; Yayue Cao</i>
P-A-24	49	Sensorless control of Synchronous Reluctance Motor based on High Frequency Square Wave Injection <i>Jie Liu; Changjiang Wang; Dayang Yu</i>
P-A-25	57	High-Stability, Long-Duration Flat-Top Magnetic Field Generation using a Novel Two-Stage Magnetic Compensation Circuit <i>Junyu Chen; Yun Xu</i>
P-A-26	59	Output Voltage Ripple Suppression Strategy for Light DC-link Capacitor DC-Type EV Charger <i>Jingke Cai; Junzhong Xu; Kaihong Cao; Yuxuan Bi; Yuxin Zhang; Yong Wang</i>
P-A-27	60	Model Predictive Control Strategy for High-Power Wind Turbine based on Paralleled Active Neutral Point Clamped Converter <i>Pedro Catalán; Yanbo Wang; Joseba Arza; Zhe Chen</i>
P-A-28	61	Comparisons of Decentralized Model Predictive Control without Weighting Factors for Electrical Drive Systems <i>Haotian Xie; Yao Wei; Dongliang Ke; Xinhong Yu; Dongxiao Huang; Fengxiang Wang; Jose Rodriguez; Ralph Kennel; Marcelo Heldwein</i>
P-A-29	62	Adaptive Fuzzy Sliding Mode Based Current Control for PMSM Servo Drive Systems <i>Bing Zhang; Qianwen Duan; Nanfang Lv; Xinglong Chen; Yao Mao</i>
P-A-30	65	Fault-Tolerant Control of Open-phase Fault in Sensorless PMSM Drives <i>Yun Zhang; Yao Mao; Xueqing Wang; Lei Kong; Ting Zhang; Qianwen Duan; Jiuqiang Deng</i>
P-A-31	66	Estimated Load Feedforward instead of Voltage Integrator for Phase-Shifted Full Bridge Converter to Enhance Dynamic <i>Mingyu Xue; Bin Cao; Kaiwei Cao; Haicong Zhang; Jifeng Chen; Xu Chu; Xiaohua Jiang</i>



P-A-32	67	A Low-Frequency Ripple Suppression Strategy for Multi-Module DAB Fed Single-Phase VSI <i>Jia Shu; Zhenchao Li; Ziyin Wang; Junhua Wang; Yan Zhang; Jinjun Liu</i>
P-A-33	69	Performance Instability of 650 V p-GaN Gate HEMTs under Temperature-Induced Negative Gate Bias Stresses <i>Renze Yu; Saeed Jahdi; Phil Mellor</i>
P-A-34	72	Research on Coupling Error Compensation Method of Macro-micro Composite Platform <i>Tianrun Kang; Mingyi Wang; Yiyi Li</i>
P-A-35	74	Deadbeat Control Method for T-type Three-Phase Four-leg Three-Level Inverters <i>Junlong Ding; Yi Zhu; Yang Yang; Xiaoping Chen; Jose Rodriguez</i>
P-A-36	75	Sensorless Control of Synchronous Reluctance Motors Based on MRAS <i>Xingmei Zhao; Wenxiang Song; Yukun Liu</i>
P-A-37	81	Quantitative Impacts Analysis of the Inner Current Loop on Grid-Tied Converters' Transient Synchronous Stability <i>Xilin Li; Ruiqi Zhang; Zhen Tian; Meng Huang; Xiaoming Zha</i>
P-A-38	87	A novel TS/S-SP variable structure wireless power transfer converter <i>Yiming Zhang; Zhilei Yao</i>
P-A-39	88	Reinforcement Learning based Weight-Tuning Model Predictive Control of Permanent Magnet Synchronous Motor <i>Aole Deng; Weilin Yang; Guanyang Hu; Wentao Huang; Dezhi Xu</i>
P-A-40	89	Low-frequency Oscillation Analysis of Railway Train-Network System Considering the Two Feeding Sections of the Traction Substation Based on Harmonic State-space Modeling <i>Qiqi Yang; Xiaoqin Lyu; Wenwen Zhu</i>
P-A-41	94	Stability Analysis and Current-loop Reshaping for Voltage-Source Converters with Power Control <i>Bao Xie; Weike Zheng; Pingyu Li</i>
P-A-42	95	A Switching Frequency Selection Method for Single-phase PWM Rectifier Considering Lifespan and THD <i>Zhen Wang; Bi Liu; Xu Chen; Meichen Lin; Lin Peng; Wenjie Zhu; Haoran Li; Kun Tan; Cungang Hu; Zhenyu Wu</i>
P-A-43	99	High Gain DC/DC Converter Topology With Switching Capacitor <i>Zongyuan Liu; Caixue Chen; Sihong Li</i>
P-A-44	101	Piezoelectric Based Class-E Resonant Inverter for Driving Surface Dielectric Barrier Discharge Plasma <i>Mingyu Yang; Eric Stolt; Zhechi Ye; Juan Rivas-Davila</i>
P-A-45	105	Research on Bidirectional Wireless Charging System for Electric Vehicles Based on H _∞ Robust Control <i>Xinheng Li; Chenyang Xia; Haipan Li</i>
P-A-46	106	Four-quadrant operation for self-synchronous voltage source PWM converter <i>Ziteng Guo; Han Wang; Yunfeng Cao; Xu Cai</i>
P-A-47	108	Research on Redundant Control Technology of ±10kV/10MW ACDC converter <i>Anmin Tian; Jiayuan Ma; Jiayu Wang; Guangmiao Sun; Wenbing Lu</i>
P-A-48	109	Analysis of a Novel Motor Drive System with Zero Common mode Voltage <i>Haoyan Zhuang; Xiaobin Mu; Wenbin Liu; Hao Yi; Yanhui Qiu; Zhiyuan Cai</i>



P-A-49	111	Extended Kalman Filter based Sensorless Control of PMSM using Flux-immune MPC <i>Junqiang Luo; Kai Yang; Jincheng Yu; Yixiao Luo</i>
P-A-50	112	Communication Method of SOC Based on Power and Signal Dual Modulation in the DC Microgrid <i>Hong Chen; Zhilei Yao</i>
P-A-51	114	Fault Diagnosis of PMSM Drives Based on Digital Twin Modeling <i>Luhan Jin; Yao Mao; Xueqing Wang; Linlin Lu; Jincong Zhu</i>
P-A-52	115	Stability Analysis for Energy Storage Converter with VSG Control <i>Ruixun Ma; Ao Zhang; Chuanzhuo Yi; Xueguang Zhang</i>
P-A-53	116	Analysis of Ferrite Core Loss Under Multi-level Stair Voltage Excitation Considering the Voltage Sequence <i>Zhanlei Liu; Lingyu Zhu; Yongliang Dang; Shengchang Ji</i>
P-A-54	117	A new Quasi-Z source inverter with high voltage boost ability <i>Chongyang Song; Shihong Gan</i>
P-A-55	118	Linear Active Disturbance Rejection Control of Virtual DC Mahince for Pulsed-power Load Compensation <i>Jinli Zhang; Wei Chen; Yang Qi; Weilin Li; Boning Li</i>
P-A-56	120	Constant Voltage Charging of Inductive Power Transfer System under Various Coupling Coefficients and Load Conditions Based on Switched-Controlled Capacitor <i>Huang Li; Fei Gao; Xin Liu; Huanjun Niu; Kai He; Yuxin Liu; Zhenghao Wang</i>
P-A-57	121	Adaptive Torque Ripple Suppression Strategy for Switched Reluctance Machine Based on Fuzzy Iterative Learning Control <i>Qingkun Yang; Shoujun Song; Chenyi Yang; Yu Sui; Qiyuan Cheng; Chong Bao</i>
P-A-58	122	Research on An Asymmetric Modulation Scheme With Minimum Rms Inductor Current Stress <i>Pengyu Gao; Jiachen Tian; Haotian Deng; Jiayu Tang; Feng Wang; Fang Zhuo</i>
P-A-59	123	Reactive Power Compensation Strategy for Open Winding Synchronous Reluctance Motor <i>Yu Sui; Chong Bao; Chenyi Yang; Qingkun Yang; Haina Sun; Shoujun Song</i>
P-A-60	125	A Dynamic Thermal Model of the Forced Air Cooling Heatsinks and the Optimal Design Closed to the Limit <i>Zixuan Geng; Hongyi Lin; Dongdong Chen</i>
P-A-61	129	Analysis and Design of Three Phase Y-Y LLC Converters for Battery Chargers Based on Time-Domain Model <i>Ning Guo; Jinjun Liu; Sixing Du</i>
P-A-62	131	Ripple Voltage and Loss Reduction of Single-Phase ISOP SST by Eliminating the Second Harmonic Current in LLC Converters <i>Wei Tianyu; Cervone Andrea; Dujic Drazen</i>
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P-A-251	507	A Multi-terminal Silicon Carbide Power Module With Low Parasitic Inductance <i>Daoyong Jia; Xi Jiang; Ying Wang; Song Yuan; Xiaowu Gong</i>
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P-A-256	532	Torque Ripple Extraction and Reduction for Finite Control Set Model Predictive Current Control used in Permanent Magnet Motors <i>Yunshu Liu; Chao Gong; Shuangxia Niu; Xing Zhao; Jose Rodriguez</i>
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P-A-258	536	High-speed DTP-PMSM flying start based on nonlinear flux observer <i>Fengyang Liu; Guijie Yang; Jianyong Su</i>
P-A-259	539	Fault diagnosis of pumped storage unit based on multi-physical parameter detection <i>Zhiwei Wen</i>
P-A-260	541	Classification and Analysis of Nanosecond Pulsed Laser Driver with Circuit Theory <i>Zhibao Yuan; Zengquan Yuan; Rui Li; Chen Gong; Haiping Xu</i>
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P-A-264	553	A Complex Coefficient Low Pass Filter Based Sliding Mode Observer for SPMSM Position Sensorless Control <i>Jiacheng Jiang; Xuemei Sun; Lizhi Sun; Quntao An</i>
P-A-265	555	Low Coupling Capacitance Gate Driver Power Supply for Series-Connected Silicon Carbide Intelligent Power Module <i>Yongjie Zheng; Lijian Ding; Xiangdong Yu; Shuang Zhao; Yunchao Luo; Pinpin Chai; Helong Li</i>
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P-A-272	577	Research on Servo Control System Based on Linear Active Disturbance Rejection Control Technology <i>Xinyu Li; Liang Xia; Wei Feng; Yidong Chen; Shijun Huang; Liming Gong; Tianfu Sun</i>
P-A-273	578	Research on Frequency Regulation Characteristics of Energy Storage Coordinating High Proportional Wind Power in Power Systems <i>Cui Liu; Dongyang Luan; Muhammad Shahid Mastoi; Jiaojiao Zheng; Mannan Hassan</i>
P-A-274	579	Fault Diagnosis of Five-Phase Inverter-Fed Motor Drives Based on One-Dimensional Convolutional Neural Network <i>Bowen Cui; Huamin Cui</i>
P-A-275	580	A Two-stage Non-isolated Pulsed Power Supply with Low Fluctuation of the Input Current for Low-Frequency Pulsed Loads <i>Tao Sun; Jing Yang; Yunhao Zhang</i>
P-A-276	584	Two-Layer Distributed Control for Optimal Power Allocation in Islanded Networked Microgrids <i>Weitao Yao; Yan Xu; Yu Wang; Xu Xu</i>
P-A-277	587	TPS-MPC Method with Backflow Power Optimization for Series Resonant DAB Converter <i>Shuzhen Huang; Jianping Xing; Ning Wang; Fawei Song</i>
P-A-278	589	Robust IGBT Open-Circuit Fault Diagnosis Method based on Deep Learning Network Considering Varied Operation Conditions <i>Yongjie Liu; Ariya Sangwongwanich; Yi Zhang; Rong Kui; Yingzhou Peng; Khalifa Al Hosani; Huai Wang</i>
P-A-279	591	Fault diagnosis of the lithium-ion power battery current/voltage sensor based on a fusion diagnosis factor <i>Muyao Wu; Changpeng Tan; Yuzhao Qian; Li Wang</i>
P-A-280	592	A Novel State Restriction and Disturbance Suppression Strategy Based on Variable Gain Dynamic Manifold Super-Twisting Sliding Mode Control <i>He Wang; Yongting Deng; Meng Shao; Haiyang Cao; Xiufeng Liu; Xiaomeng Zhou</i>
P-A-281	593	Fault Location and Tolerant Control Strategy for Power Electronic Transformers with a Single IGBT Open-Circuit Fault <i>Wei Zeng; Yuanhui Chen; Min Sun; Haoran Lin; Zongjie Liu; Xuan Zhang; Yinlei Liu; Kun Qin; Ruiqi Wang</i>
P-A-282	595	Transient Stability Analysis and Enhancement of Grid-Following Converters Considering DC Voltage Dynamics Under Power Step <i>Zhanqi Huang; Chao Wu; Yong Wang; Shiyang Li</i>
P-A-283	596	A Novel Fault Ride Through Strategy based on Multi-dimensional Information for MMC-VSC HVDC System <i>Lin Liu</i>
P-A-284	597	Hierarchical Control of Three-Phase Series-Connected Power Modules Based Islanded Microgrid <i>Min Sun; Yuanhui Chen; Wei Zeng; Zongjie Liu; Wenxiu Dong; Zhaohui He; Yan Wang; Ruiqi Wang</i>



P-A-285	598	Fault Detection and Ride-Through Operation Method for CHB Converter Based STATCOM Integrating Controller Information and Measurement Data <i>Kaicen Li; Ke Zhou; Weina Kong; Yuanhui Chen; Ruiqi Wang; Zongjie Liu; Wei Zeng; Min Sun</i>
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P-A-287	611	Shore Power System Load Forecasting Model Based on QPSO-LSTM Network <i>Jijian Tong; Yayu Yang; Xiaoyan Xu; Gengwu Zhang; Feng Yuan; Guang Xiang; Kangan</i>
P-A-288	612	Wiring Harness Cable Input Impedance Verification For Electromagnetic Compatibility Pre-Compliance Testing <i>Shih-Fan Liu; Bo-Shiang Lee; Katherine A. Kim; Tsai-Sheng Lin; Sheng-Han Hsieh</i>
P-A-289	613	Modeling and EMC Analysis of Capacitive Coupling to Low-Voltage Cables in an Electric Vehicle <i>Bo-Shiang Lee; Shih-Fan Liu; Katherine A. Kim; Tsai-Sheng Lin; Sheng-Han Hsieh</i>
P-A-290	615	A Fast dynamic droop control strategy based on output impedance for DC microgrids <i>Zhangyong Chen; Yunyan Liu; Tieqi Wang</i>
P-A-291	619	Suppressing Inter-module Oscillations for Paralleled 10 kV SiC MOSFET Modules <i>Nianzun Qi; Zhixing Yan; Gao Liu; Morten Rahr Nielsen; Jannick Kjær Jørgensen; Asger Bjørn Jørgensen; Szymon Michal Beczkowski; Bjørn Rannestad; Hongbo Zhao; Stig Munk-Nielsen</i>
P-A-292	622	Comparison Between PLL-Based and PLL-Less Grid-Forming Converters <i>Shan Jiang; Ye Zhu; Georgios Konstantinou</i>

Poster Presentation B

Poster Presentation B		
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		Zhonggang Yin Xi'an University of Technology, China
		Stig Munk-Nielsen Aalborg University, Denmark
Poster No.	Submission ID	Paper Information
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P-B-2	629	A Novel Sensorless Control Scheme based on Disturbance Observer for Drive Motor <i>Chunfeng Yu; Hao Huang; Yuanfeng Zhang</i>
P-B-3	633	Wide-Input-Range High-Frequency-Link Split-Phase Microinverter with Active-Power-Decoupling Ability <i>Xuwen Li; Jia Liu; Fangchao Ji; Xueqian Cao; Yue Wang; Jinjun Liu</i>
P-B-4	636	Improved Disturbance Observer for Grid Current Harmonic Suppression <i>Yibo Xuan; Kelian Zhou; Chao Tang</i>
P-B-5	644	An Advanced Voltage Support Strategy for VSCs in AC/DC Hybrid Distribution Networks under Fault <i>Yuze Li; Qianming Xu; Peng Guo</i>
P-B-6	645	Enhanced Short-Circuit Capacity of Grid-Forming Modular Multilevel Converters with Oval-Shaped Current Limiters <i>Ye Zhu; Shan Jiang; Georgios Konstantinou</i>
P-B-7	646	Current Sensorless Model Predictive Current Control based on Luenberger Observer for PMSM Drive <i>Sicong Wen; ManFeng Dou; Dongdong Zhao; Zhiguang Hua</i>
P-B-8	647	Temporal Data-driven Predictive Control for Coastal Island Distribution Power System Stability Enhancement <i>Zhijie Zeng; Guojun Bao; Ronghe Zhang; Chaoping Deng; Ting Huang; Qinyun Huang; Yingling Zhang</i>
P-B-9	648	Analysis and Design of a Bidirectional Step-Up/Down Partial Power Converter for Battery Energy Storage System <i>Xingao Tao; Lizheng Sun; Feng Wang; Yihan Xie; Fang Zhuo</i>
P-B-10	651	An Asymmetrical Duty Cycle Control of Three Phase LCL Dual Active Bridge Converter to Reduce RMS Phase Current <i>Hui Chen; Jinjun Liu; Sixing Du; Ning Guo</i>
P-B-11	653	Research on Voltage Control Strategy of PV-VSG DC-side Based on ADRC <i>Jian Luo; Xingshuo Li; Shuye Ding; Yizhi Chen</i>
P-B-12	654	A LCL-type DAB Converter with Hybrid Modulation Strategy <i>Rui Wang; Xiaodong Li; Shi-Yuan Liu; Song Hu; Hao Chen</i>
P-B-13	655	A Dual-transformer Series Resonant Converter for Wide Output Voltage Range Applications <i>Yinan Li; Xiaodong Li; Song Hu; Peiwen Li; Wanlin Nie</i>
P-B-14	656	Indirect-modulated MMC Current Control with a Voltage Disturbance Estimation and Compensation <i>Dongjoon Kim; Seungki Sul; Shenghui Cui</i>



P-B-15	658	Effect of Distributed Decoupling Capacitors in Multi-chip SiC Power Modules on Current Sharing Mechanism <i>Hongzhou Gong; Laili Wang; Junhui Yang; Wenbo Fan; Yi Liu; Shijie Wu; Kai Gao</i>
P-B-16	659	Research and Design on the Control Rod Drive Mechanism Power Supply and Control Strategy for the Nuclear Power Plants Based on Silicon-Controlled Rectifier <i>Mingzhou Xu; Gao Zheng; Zerun Zhao; Ping Yang; Yusheng Peng</i>
P-B-17	660	Stability Analysis of Adaptive Virtual Impedance-Based Current Limitation of Grid-Forming Inverters <i>Cheng Luo; Dapeng Lu; Hongwei Zhou</i>
P-B-18	667	A Power Ripple Suppression Method for Grid-Forming Converter under Imbalanced Grids <i>Ke Zhou; Bingtao Zhang; Zongjie Liu; Yang Li; Qiliang Zhang; Lei Xu; Wei Zeng; Min Sun</i>
P-B-19	671	An Improved Virtual Space Vector Method for Three-level NPC Inverters <i>Haoyu Zhang; Wentao Zhang; Yongxiang Xu; Jibin Zou</i>
P-B-20	674	An Unweighted Factorized Multi-objective Model Predictive Control Strategy Applied to a Three-level DC-DC FC Converter <i>Zhangyong Chen; Tieqi Wang; Yunyan Liu</i>
P-B-21	676	An Improved Discretization Method for IM Full-order Flux Observer under Low Sampling Frequency <i>Jiacheng Xu; Haitao Yang; Yongchang Zhang</i>
P-B-22	679	Application of DAB Converter with Partial Power Transfer in Battery Energy Storage Systems <i>Dong Lin; Tiesheng Yan; Wenyuan Chen</i>
P-B-23	683	A Real-Time Estimation Method of Switching Delay for Power Devices in the High-Power IGCT Converter <i>Pei Yang; Bo Zhang; Qiongxuan Ge; Xiaoxin Wang</i>
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P-B-28	694	Design of Flat Two-stage Hybrid Resonant Isolated Micro-inverter <i>Qingzheng Li; Xu Yang; Wei Zhou; Yuhang Xu; Tianqi Weng; Rui Cheng</i>
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P-B-32	699	Impedance Modeling and Stability Analysis of the Grid-forming Converter in Current Saturation Mode <i>Kaijie Gao; Yonghui Liu; Runtian Li; Yue Wang</i>

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P-B-36	707	ZVS Boundaries for NPC-Type Series Resonant Dual Active Bridge Converter Using Frequency Domain Analysis <i>Yufan Li; Fei Xiao; Jilong Liu; Peng Chen; Rui Zhou</i>
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P-B-173	993	A dq-Domain Impedance Measurement Methodology for Three-Stage Generator Cascade System in More-Electric Aircraft <i>Zixiao Xu; Yang Qi; Hongwei Zhao; Yufeng Wang; Weilin Li</i>
P-B-174	995	Design Adjustment Strategy of Switched Reluctance Machines for Resonance Avoidance <i>Jiaxin Zhang; Junhao Liu; Lefei Ge</i>
P-B-175	996	Electro-Thermal Digital Twin for GaN eHEMT Power Modules Temperature Characterization during Power Cycling Tests <i>Zhongchao Sun; Masaki Takahashi; Wendi Guo; Stig Munk-Nielsen; Asger Bjørn Jørgensen</i>
P-B-176	998	DC-link Voltage Optimization of the Resonant-Type Repetitive Pulsed Power Supply for the Charging Loss Reduction <i>Zhou He; Yingzhe Liu; Hongfa Ding; Ziqi Zhang; Dandi Zhang; Jiannan Shao; Yi Tang</i>
P-B-177	999	Cooperative Interharmonics Control Scheme for Parallel Photovoltaic Inverters With Particle Swarm Optimization and Phase-Shifting <i>Wenbo Wu; Guangqian Ding; Xinmeng Zhang; Bin Qiao; Jing Wang; Zhiyuan Pan</i>
P-B-178	1002	Enhancing Fault Tolerant Ability of Motor Drive System Using Novel Open-end Topology <i>Junnan You; Zicheng Liu; Dong Jiang; Jiahua Zhang; Bin Li; Yougen Huang</i>
P-B-179	1004	A LCL-Network Based Single Stage Multi-port Hybrid AC/DC Converter <i>Wangpengcheng Xiang; Lingling Cao</i>
P-B-180	1007	Machine Learning Based Sensor Fusion for Junction Temperature Estimation <i>Kevin Muñoz Barón; Diego Kuderna Melgar; Valentyna Afanasenko; Ruben Schnitzler; Ingmar Kallfass</i>
P-B-181	1008	A Simple Open-loop Soft-startup Method Based on Operation Mode Analysis for LCC Converters Used in High-voltage DC Power Supply <i>Kai Zhang; Kai Sun; Hanyu Liu</i>
P-B-182	1009	A Cell-to-cell Voltage Balancing Strategy with Bidirectional Flyback Converter <i>Jun Hyeong Kwon; Seong Cheol Choi; Guangxu Zhou; Seong Mi Park; Sung Jun Park; Yipei Wang</i>



P-B-183	1012	Transient Analysis of Proportional-Resonant-Controlled Inverters for Dynamic Load <i>Zhihe Zhang; Xin Yang; Yuanhong Zhang</i>
P-B-184	1013	Noval Grid-forming Control for PV Connected to Weak AC Grid <i>Qiuyu Lu; Yuqi Shen; Yue Chen; Xiaotian Yuan; Pingping Xie; Yujun Li; Zhengchun Du</i>
P-B-185	1015	The Application of Artificial Intelligence Technology in Offshore Wind Power Generation Systems <i>Yanan Li; Jianhui Cui; Hongna Li; Bin Zhao</i>
P-B-186	1017	Grid-supporting Characterization of MMC-HVDC System for Offshore Wind Farm Under Different Control Modes: A Comparative Study <i>Lin Xu; Chang Liu; Jingyi Zhang; Zhen Tian; Pan Feng; Sijie Liu; Fei Liu</i>
P-B-187	1021	Small-signal Model of Inductive Power Transfer System Considering the Dynamic Coupling Variation <i>Tianqi Li; Guangce Zheng; Minfan Fu</i>
P-B-188	1023	Online MTPA Control of PMaSynRM Considering Magnetic Saturation Effects <i>Kaiwen Tan; Jiayong Su; Guijie Yang; Bencheng Zhong; Shiyun Li</i>
P-B-189	1024	Development of Dual Rotor Propulsion System for Contra-Rotating Propeller Drive <i>Jun-Shin Park; Min-Gwan Gwon; Byoung-Gun Park; Ki-Chang Lee; Yeon-Ho Jeong; Ji-Won Kim</i>
P-B-190	1035	Regenerative Halbach-motor Traction Drive Powered by An Active-damping Controlled Interleaved Y-inverter <i>Yonghwa Lee; Alberto Castellazzi; Domae Shinichi; Taketsune Nakamura</i>
P-B-191	1037	An Interharmonics Mitigation Control Scheme for Discontinuous Conduction Mode Flyback Microinverters <i>Celiang Deng; Jianyu Bao; Cheng Yan; Fan Zhang; Feng Jiang; Min Chen</i>
P-B-192	1038	Power-Hardware-in-the-Loop Emulation of Synchronous Motor with Inter-Turn Short-Circuit Fault <i>Jiahua Zhang; Yuanhao Xie; Dong Jiang</i>
P-B-193	1039	SOC Equalization Control Strategy of Energy Storage in DC Microgrid Based on Improved Consensus Algorithm <i>Na Zhi; Yuhang Yang; Shuai Chigan</i>
P-B-194	1040	Research on Active DC Islanding Detection Method Based on Lock-In Amplifier <i>Na Zhi; Jilin Qiu; Yiding Ding</i>
P-B-195	1041	Harmonics Influence Analysis on Current-Oversampling-based Position Estimation under Multi-mode PWM for IPMSM Sensorless Drives in Rail Transit Applications <i>Hang Zhang; Yukun Lei; Yanqing Zhang</i>
P-B-196	1043	Time-Domain-Based Phase-Shift Control Strategy for LLC Converters in EV Charger with Small DC-Link Capacitance <i>Kaihong Cao; Xiyuan Shi; Jingke Cai; Junzhong Xu; Yong Wang</i>
P-B-197	1046	3-Phase 1kW Sinusoidally-modulated 1MHz-switching GaN Power Converter for Non-Resonant WPT Applications <i>Yutaro Sakuraba; Yonghwa Lee; Onishi Soichi; Alberto Castellazzi</i>
P-B-198	1048	Impedance Modeling and Small Signal Stability Analysis of the Cascaded AC/DC Converter <i>Sicong Jin; Xin Zhang; Dehong Xu</i>
P-B-199	1049	Online Inductance Identification Based on Cross Back Electromotive Force Compensation of PMSM <i>Shaobo Liu; Qiwei Wang; Gaolin Wang; Dawei Ding; Binxing Li; Guoqiang Zhang; Dianguo</i>

P-B-200	1051	Phase Delay Analysis of SP-SECE for Piezoelectric Vibration Energy Harvesting and Optimization <i>Xinyue Lv; Han Peng; Junhao Lei; Yidong Zhao; Yuyao Yan</i>
P-B-201	1052	Dynamic Inertia Modeling and Evaluation of MMC-HVDC with Virtual Inertia Control <i>Zheyu Li; Xiaoyu Li; Yingying Zhao; Kun Li; Donghai Zhu; Xudong Zou</i>
P-B-202	1055	SiC MOSFET Degradation Monitoring based on Source Inductance Voltage <i>Jiahong Liu; Bo Yao; Xing Wei; Yichi Zhang; Zhihao Lin; Huai Wang</i>
P-B-203	1057	Establishment of Degradation Model and Transfer Model for P-channel Power MOSFET under Negative Bias Temperature stress <i>Cen Chen; Haodong Wang; Haonan Yin; Wei Zheng; Guofu Zhai</i>
P-B-204	1058	Distributed Energy Coordination Control for Battery Storage Systems in a DC Microgrid <i>Zhiwu Huang; Jiajian Hu; Ren Zhu; Yang Gao; Heng Li; Bin Chen</i>
P-B-205	1059	The Packaging Design of the 3.6kV Integrated SiC MOSFET Power Module <i>Jianing Wang; Donglei Zhang; Shaolin Yu; Shuang Zhao; Nan Zhu; Pinpin Chai; Abel Luo</i>
P-B-206	1061	An Asymmetric Modulation Strategy for a Single-Phase Single-Stage AC-DC Converter <i>Xingxing Chen; Di Mou; Junwei Liu; Qingchao Song; Chi Shing Wong; Ka-Hong Loo</i>
P-B-207	1062	Design and Experimental Verification of an Oil-Cooled Medium-Frequency Transformer for a 250kW Half-Bridge Series Resonant Converter <i>Siqi Lin; Daniel Haake; Anton Gorodnichev; Jens Friebe</i>
P-B-208	1063	Induction Motor Transient Torque Output Predicting Method Based on LSTM and Self-Attention Mechanism <i>Haiwei Cai; Rui Qian</i>
P-B-209	1064	A Symmetrical Hybrid Five-Level Inverter for High-Speed PMSM Drive <i>Pengfei Xie; Zunmin Ma; Nianzhou Liu; Jupeng Pang; Kui Wang; Yongdong Li</i>
P-B-210	1065	Proactive Learning Renewable Energy Management Strategy for Isolated DC Microgrid <i>Fei Li; Jiangpeng Wu; Ren Zhu; Jieqi Rong; Zini Wang; Heng Li; Rui Zhang</i>
P-B-211	1068	2D Loop Coils based Magnetic-field Focusing (MFC) by Machine Learning <i>JinHyuk Jang; Eunsoo Lee</i>
P-B-212	1070	Curriculum Learning Receding Horizon Energy Management for Quadruped Robot <i>Zhiwu Huang; Zixuan Wang; Ren Zhu; Yunsheng Fan; Zi Yu; Fu Jiang; Weirong Liu</i>
P-B-213	1073	An On-State Resistance Monitoring Method of T-type Three-Level Inverters <i>Qi Zhao; Min Zhang; Ke Shen; Dan Zhao</i>
P-B-214	1074	A Common-mode Voltage Fluctuation Reduction Method and Topology for Triple Active Bridge DC-DC Converter <i>Kaixuan Gao; Ke Shen; Guangzhao Luo; Dan Zhao</i>
P-B-215	1075	Instantaneous Optimal Zero-Sequence Voltage Injection of Modular Multilevel Converter for Maximum Output Voltage Synthesis <i>Sanggi Ko; Seung-Ki Sul; Shenghui Cui</i>
P-B-216	1078	AI-Enabled Cooperative Control for DC Microgrids of Battery Storage System <i>Fei Li; Weifei Tu; Ren Zhu; Hongjiang He; Yingze Yang; Feng Zhou; Heng Li</i>



P-B-217	1080	A Multi-relay Simultaneous Wireless Power and Data Transfer System With 100-kbps Communication Link <i>Shimin Zhou; Yueshi Guan; Jiachao Zong; Yijie Wang; Dianguo Xu</i>
P-B-218	1081	Analysis and Design of a Novel Isolated SEPIC Converter <i>Jingbo Cui; Yueshi Guan; Yi Cheng; Yijie Wang; Dianguo Xu</i>
P-B-219	1083	Dynamic Evolution Control Method for Isolated Half-Bridge Three-Level DC/DC Converter <i>We Zhou; Bin Fu; Jiang You</i>
P-B-220	1084	Research on the Control Method of Space Motor Considering Compensation of Parameter Perturbation <i>Xiaofeng Ding; Yufei Dong</i>
P-B-221	1088	Preconditioning for Accurate Threshold Voltage Extraction of SiC MOSFETs after AC Bias Temperature Instability in Reliability Tests <i>Cen Chen; Zicheng Wang; Ruyue Zhang; Yifan Hu; Xiaosheng Zhang; Yanchen Pan; Yaokang Lai; Jiangyuan Du</i>
P-B-222	1089	Tertiary Coil Design of Wireless Electric Vehicle for Large Misalignment Tolerance <i>Ki Hyun Pyo; Jae Joon Kim; Eun Soo Lee</i>
P-B-223	1093	Design of High-speed Permanent Magnet Generator with Litz Wire Winding Structure <i>Minchen Zhu; Chengwei Gan; Yue Gao; Yanwen Zheng; Dongliang Liu</i>
P-B-224	1094	A Current Limiting Method with Sequence-Separated Control Strategy for Modular Inverter System under Asymmetrical Short Circuit Faults <i>Chang Xu; Jiuqing Cai; Fang Wu; Dewang Hu; Zihao Lu; Jingyi Liao; Jinwu Gong; Shangzhi Pan</i>
P-B-225	1095	A Novel Exponential Anti-Windup of Fuzzy PID for Marine Electric Propulsion System <i>Guoling Wang; Rongxuan Li; Zhenyu Li; Ruifang Zhang; Huiran Sui</i>
P-B-226	1096	A Push-Pull DAB DCX Converter with Dual Coupled Inductors Achieving Full Load Range ZVS <i>Mingjin Zhang; Guo Xu; Liting Li; Yaohui Qu; Zhengmei Lu</i>
P-B-227	1097	Variable DC-link Voltage Control Strategy for Starter Motor <i>Mingkuang Huang; Hongwei Ma; Congzhe Gao; Junliang Chen</i>
P-B-228	1098	High Performance Dynamic Voltage Restorer with Harmonic Compensation Capability <i>Ancheng Liu; Junjae An; Hyeonuk Go; Min-Seong Kim; Sung-Jun Park</i>
P-B-229	1099	Power-Hardware-in-the-Loop Motor Emulator under Four-Quadrant Operation Condition <i>Gengchen Zhang; Hong Guo; Jinqian Xu; Wenbo Jin; Jianqiao Dong</i>
P-B-230	1100	Research on Harmonic Weakening Modulation of Railway Power Conditioner under High Double-Frequency Ripple of DC Side Voltage <i>Pei Luo; Ming Luo; Zhenxi Li; Hongyan Peng; Yi Wu; Xing Gao</i>
P-B-231	1102	Quasi-Square-Wave Modulation Considering Dead Zone Compensation for Modular Multilevel DC-DC Converters <i>Long Xu; Jing Sheng; Xin Xiang; Heya Yang</i>
P-B-232	1104	A Study of Pulse Density Modulation to GaN Y-Inverter <i>Prakash Gautam; Yonghwa Lee; Ryo Takahashi; Alberto Castellazzi</i>
P-B-233	1105	An Accurate and Universal Time Domain Model for Different Resonant Converters by Considering Non-ideal Effects <i>Ziang Li; Yuqi Wei; Shuo Zhang; Jinjun Liu; Alan Mantoath; Marco Liserre</i>

P-B-234	1107	A 3D-SVM Algorithm for Three-Phase Four-Leg Four-Wire Three-Level Inverter <i>Heng Chu; Yan Zhang; Chaomin Xiao; Jinjun Liu; Fan Zhang; Shenghui Gu</i>
P-B-235	1108	Characterization and Failure Mechanism Study of Ohmic Gate GaN HEMT under Overcurrent Stress <i>Xi Jiang; Jing Chen; Song Yuan; Zhaoheng Yan; Xiaowu Gong; Zhenjiang Pang; Lei Wen; Xiaosong Bu; Haimin Hong</i>
P-B-236	1109	Fixed-Frequency Full-Domain Soft-Switching Control Strategy for Non-Inverting Four-Switch Buck-Boost Converter <i>Zhuyong Fu; Fang Li; Fengxiang Zhang; Yajing Zhang; Jun Xu; Mingkong Qiu</i>
P-B-237	1110	A Data-Driven Condition Monitoring Method for Capacitor in Modular Multilevel Converter (MMC) <i>Shuyu Ou; Mahyar Hassanifar; Martin Votava; Marius Langwasser; Marco Liserre; Subham Sahoo; Ariya Sangwongwanich; Frede Blaabjerg</i>
P-B-238	1111	A Multi-Objective Orderly Charging Strategy for Electric Vehicles Considering Continuous State <i>Qiqi Ren; Tong Liu; Alian Chen</i>
P-B-239	1112	LS-SVM based Capacitor Anomaly Identification Method <i>Chunlin Lv; Yuxi Deng; Jinjun Liu; Xiaotong Zhang; Yan Zhang; Fei Chang</i>
P-B-240	1113	Electric Submersible Pump Equivalent Circuit System Analysis <i>Xuanxi Liu; Byungju Bae; Younghoon Cho; Hanyoung Bu; Choiseung Cheol; Hongchan Oak</i>
P-B-241	1114	Study on Speed Loop Improvement Strategy based on the Fusion of Repetitive Controller and Negative Feedback <i>Xiao Wang; Xusheng Wu; Xi Xiao</i>
P-B-242	1115	Modified Dynamic Time Domain Model for LLC Resonant Converter by Considering Parasitics and Various Modulation Strategies <i>Shuo Zhang; Yuqi Wei; Ziang Li; Jinjun Liu; Alan Mantoath; Marco Liserre</i>
P-B-243	1116	A Lightweight Self-Powered Module Based on Magnetic Energy Harvesting for Transmission Line Remotely Sensing <i>Yidong Zhao; Han Peng; Hongfei Xiao; Liwen Hou; Yuyao Yan; Weiming Chen; Chao Li</i>
P-B-244	1127	Comparisons of Dynamic Characteristics between Grid-Forming and Grid-Following Converters <i>Yunzhuo Wei; Jia Liu; Liangli Xiong; Zhi Chen; Jinjun Liu; Li You; Gang Han</i>
P-B-245	1130	Investigating the Impact of Sensor Placement on the Stability of Power Hardware-in-the-Loop with a Grid-Following Inverter as Hardware-under-Test <i>Fargah Ashrafidehkordi; Giovanni De Carne</i>
P-B-246	1131	A Novel LC-N Resonant Topology for Strongly-coupled Wireless Power Transfer System <i>Shuai Ren; Beibei Song; Shumei Cui; Shuai Dong; Shiwei Shi</i>
P-B-247	1132	A Frequency Feedforward Strategy for the Grid-Forming Inverter <i>Hongwei Zhou; Xu Yang; Jiansong Zhang; Dapeng Lu</i>
P-B-248	1133	Parameter Identification of Underwater Wireless Power Transfer System Based on Adam Optimization Algorithm <i>Huan Wu; Jianwei Zhao; Fangrui Wang; Longlei Bai; Jiang You; Bo Luo</i>
P-B-249	1137	The model of Bidirectional CLLC Resonant Converter with Variable Frequency and Single Phase Shifted Control <i>YiHeng Zhang; Kai Qiu; JiaRong Xie; PengYu Jia</i>
P-B-250	1139	Thermal Characterization of a Ceramic Baseplate-less 10 kV SiC MOSFET Power Module <i>Asger Bjørn Jørgensen; Thore Stig Aunsborg; Szymon Beczkowski; Hongbo Zhao</i>



P-B-251	1143	Transient Stability Analysis of Inverters Considering Synchronization and DC Voltage Control Interaction <i>Qi Hu; Qianjin Zhang; Siwei Sun; Dikui Mei; Sucheng Liu; Xiaodong Liu; Wei Fang; Shijing Wang</i>
P-B-252	1146	Integrated Inductor Modeling and Current Balance Control for Multi-phase Interleaved Converter <i>Yu Han; Shanshan Wang; Younghoon Cho</i>
P-B-253	1147	Investigation on Reproduction of IGBT Die-attach Solder Degradation with Finite Element Thermal-mechanical Simulation <i>Yilei Wei; Xin Yang; Xinlong Wu; Shihan Zhao; Guoyou Liu</i>
P-B-254	1148	Offline Parameter Identification of SPMSM Based on Open Loop Voltage Injection <i>Yuting Wu; Junyu Zhao; Shanshan Gao; Dianguo Xu</i>
P-B-255	1149	Simulation and Experimental Research on the Temperature Rise of Charging Pantograph of Battery-electric Locomotive <i>Yurun Wang; Dafa Jiang; Zhiyuan Liao; Yuan Long; Wei Wang</i>
P-B-256	1150	A Fast Power Loss Calculation Method for Performance Evaluation in DC/AC Converter Design <i>Qinsong Wang; Chushan Li; Abhishek Kumar; Ramesh Bansal; Wuhua Li; Hao Ma</i>
P-B-257	1151	An Improved Calculation for Ohmic Resistance of Round-wire Self-Resonant Coils in High-Frequency Wireless Power Transfer System <i>Lei Zhu; Laili Wang; Chenxu Zhao; Jiaming Shen; Min Wu; Long Pei</i>
P-B-258	1153	Paralleled Multi-Chip Current Sensing PCB Coils for SiC Power Module <i>Zelong Qu; Peng Sun; Jianshen Qiao; Yumeng Cai; Haoran Zhang; Zhibin Zhao</i>
P-B-259	1154	PM Flux Linkage and Offset Voltage Adaptive Flux Estimation in AC Motor Drives <i>Zhengzhang Yan; Junlei Zhu; Jiahao Chen</i>
P-B-260	1155	An Improved SOC Balancing Control Strategy for Cascaded H-bridge-based Battery Energy Storage System Under Unbalanced Grid Conditions <i>Jiaxuan Lu; Shunquan Hu; Yuqi Shen; Alian Chen</i>
P-B-261	1156	A Comprehensive Analysis of Inductor Current Ripple and Filter Design for Three-phase Three-Level Grid-tie Inverter <i>Jie Jin; Zhe Zhang</i>
P-B-262	1157	Identification of Capacitor Degradation in LCL Filter for Energy Storage Systems Converter <i>Yuheng Bu; Da Kang; Xikui Yu; Hanxin Zhang; Wenli Yao</i>
P-B-263	1159	Distributed Control for Energy Management of Generators and BESS with Reduced Communication in DC Microgrids <i>Jiaming Shen; Laili Wang; Lei Zhu</i>
P-B-264	1160	Research on Carrier-Based Virtual Space Vector Modulation and DC Voltage Offset Compensation Method for Three-Level NPC Inverter <i>Zhan Gao; LiXin Wang; Wen Shen; Jingteng Wang; Maolin Song; Xuanqin Wu</i>
P-B-265	1162	Investigation into Temperature Dependency on Thermal Characterization of IGBT Modules Based on Structure Function <i>Peixin Wu; Xin Yang; Guoyou Liu; Xinlong Wu; Yuesong Wang</i>
P-B-266	1170	Cooperative Energy Management Method for Plug-In Hybrid Electric Vehicles Considering Interaction with Speed Planning Optimization <i>Zhiwu Huang; Xiaokang Dai; Ren Zhu; Boyu Shu; Xiaoyong Zhang; Hui Peng</i>
P-B-267	1173	A Study on a Thyristor Three-Phase-Single-Phase AC Converter Applied to AC Traction Power Supply System <i>Han Wang; Yankun Xia</i>

P-B-268	1174	A New Solution for Frequency Response Measurement in Power Electronics Systems: A Compressed Sensing Approach <i>Zipeng Liu; Zeng Liu; Jinjun Liu</i>
P-B-269	1175	SiC MOSFET Full Junction Temperature Estimation Modeling Method Based on Data Driving <i>Wenjun Wu; Xi Chen</i>
P-B-270	1176	Design Considerations for Magnetic Coupling in Multi-phase Interleaved Boost Converter for Fuel Cell Application <i>Xiao Yu; Mahmoud Saeidi; Jens Friebe; Peter Zacharias</i>
P-B-271	1177	A General Current Limiting Strategy of Grid-Forming Converters Based on Adaptive Virtual Impedance Regulated by Fuzzy PI Control <i>Qi Jia; Jia Liu; Jinjun Liu; Jin Xu</i>
P-B-272	1179	Radiation Electromagnetic Investigation of Gate Driver in IGBT MMC Converter Valve <i>Yuyao Yan; Han Peng; QiaoZhi Yue; Shijie Song; Manbo Wang; Xinyue Lv; Yidong Zhao</i>
P-B-273	1180	An Improved Genetic Algorithm for Hybrid Magnetic Core Design in Electric Vehicle Wireless Charging Applications <i>Sicheng Wang; Yaohua Li; Yue Wu; Yongbin Jiang; Delin Zhao; Yi Tang</i>
P-B-274	1181	A Startup Strategy for the Parallel-type All-DC Offshore Wind Power System <i>Bobo Zhang; Jinyu Wang; Xiaoyan Tian; Min Ai; Qijian Liu; Changyue Zou</i>
P-B-275	1183	Transient Stability Enhancement of Grid-Forming Converter in an Islanded AC Microgrid <i>Yawen Ding; Fei Gao; Kai Hou; Yingwei Jiang; Qiang Gao</i>
P-B-276	1186	Topological Comparison of Three-Level Inverters for Medium-Voltage Contactless Power Transfer <i>Isaac Wong; Subhashish Bhattacharya</i>
P-B-277	1188	A Proactive Operating Strategy for Microgrid Resilience Enhanced for Weather-induced Outage Events <i>Yichao Zhang; Amjad Anvari-Moghaddam; Saeed Peyghami; Yuan Li; Tomislav Dragičević; Frede Blaabjerg</i>
P-B-278	1189	Simulation Analysis of Electrical Vehicle's Remaining Discharge Energy Based on Driving Profile Prediction <i>Lishuai Miao; Weiji Han</i>
P-B-279	1191	A Multi-Objective Optimized Control Method for Dual Three-Phase Synchronous Motor with Open-Circuit Fault <i>Jie Zhang; Fei Yao; Enze Chen; Jie Xing</i>
P-B-280	1195	Considering the Global Optimization Design of a Permanent Magnet Synchronous Motor with Stator Iron Core Saturation <i>Heming Yang; Manfeng Dou; Zhiguang Hua; Dongdong Zhao; Mengxi Dang</i>
P-B-281	1197	A 3-D Thermal Network Model for IGBT Modules Considering Temperature Dependence of Heat Dissipation and Thermal Coupling <i>Xiaotong Zhang; Xiangqian Tong; Chunlin Lv; Shengwei Du; Kai Chen; Kangning Wu; Jianying Li</i>
P-B-282	1198	A Combined Deadbeat Predictive and Repetitive Control Method for the Single- / Three-Phase AC-DC Converter in Charging System for Evs <i>Yuxuan Bi; Chao Wu; Junzhong Xu; Junyu Luo; Guohua Shu; Yong Wang</i>
P-B-283	1199	A Phase Change Material Based Silicon Carbide Power Module Packaging <i>Mohammad Dehan Rahman; Xiaoqing Song</i>
P-B-284	1206	A Review of Power Electronics Converter in Hydrogen Fuel Cell Applications <i>Mohammad Dehan Rahman; Xiaoqing Song</i>



P-B-285	1212	EMI Noise Source Modeling Method Considering the Accurate Model of the Voltage Probe Based on CISPR25 Conducted EMI Testing <i>Wenzhe Su; Hong Li; Xueyang Liu; Changlin Ji</i>
P-B-286	1218	Suppression of Zero-Sequence Circulating Current for Paralleled T-Type Inverters based on Modified Double-Reference PWM <i>Zihao Lu; Jinwu Gong; Chang Xu; Kemin Dai; Zisen Lin; Heng Lin; Bing Yang; Xiaoming Zha</i>
P-B-287	1219	Stability Analysis of Grid-Forming VSC Connected to Low Impedance Grid <i>Wenbo Yan; Yunhui Huang; Zheng Fang; Dong Wang; Zhenyu He; Jinrui Tang; Xin Yin; Kelian Zhou</i>
P-B-288	1222	Wireless Power Transmission Excitation Systems for Electrically Excited Motors: Comparison of Magnetic Coupler Topologies <i>Beibei Song; Shiwei Shi; Shumei Cui; Shuai Dong; Qianfan Zhang; Shuai Ren</i>
P-B-289	1223	Gate Driver Layout Design for DAB Converter with Two Parallel SiC MOSFETs <i>Wei Zhao; Ning Xie; Wenzhi Lin; Chengzhi Li; Yu Wang; Jianfei Chen</i>
P-B-290	1226	An Improved Superimposed Frequency Method for Power Sharing and Voltage Regulation in DC Microgrids <i>Pu Zhao; Jinjun Liu; Yu Shao</i>
P-B-291	1227	Adaptive Power Control Strategy of Grid-Forming Converters For Transient Stability Enhancement <i>Chenhang Xu; Zhixiang Zou; Shuai Yuan; Jiajun Xie; Zheng Wang</i>
P-B-292	1228	Electro-Thermal Coupling Characteristics and Modeling of SiC MOSFET Modules under High Pulse Current Conditions <i>Zaojun Ma; Yunqing Pei; Laili Wang; Qingshou Yang; Tongyu Zhang; Haihua Wang</i>
P-B-293	1230	Velocity Disturbance Rejection Control of High-Speed Linear Induction Motor Based on Rolling Prediction Matrix <i>Xinyu Jiang; Fei Xu; Zixin Li; Yaohua Li; Liming Shi; Fanqiang Gao; Cong Zhao</i>
P-B-294	1236	An Optimal Sequence Small-AC-Signal Injection Based Reactive Power Sharing Method for Parallel Grid-Forming Inverters in Islanded Microgrids with Harmonic Loads <i>Jiayu Shang; Zeng Liu; Xiaochen Wu; Yidong Shi; Wenchen Wang; Jinjun Liu; Qingbin Wang</i>
P-B-295	1237	A Novel Multilevel Current Source Actively Commuted Converter For High Voltage DC Transmission <i>Hang Zhang; Zixin Li; Cong Zhao; Fanqiang Gao; Fei Xu; Zhen Li; Yaohua Li</i>
P-B-296	1239	Towards Automated Design and Manufacturing of Power Electronics and Electric Machines through Virtual Prototyping and Advanced Manufacturing <i>Xibo Yuan; Chang Jiang</i>
P-B-297	1240	Research on Model Predictive Control Method for Dual Active Bridge Based on Data-driven Predictive Model <i>Yuzong Wang; Guohui Zeng; Xiyu Luan; Jiangbin Tian; Jinbin Zhao; Xiangchen Zhu; Zhenhua Zhang</i>
P-B-298	1241	An Energy Predictive Control Strategy for Permanent Magnet Synchronous Motors <i>Qiang Zhang; Hang Su</i>
P-B-299	1243	Calibration and Thermal Characterization of Multi-Chip SiC Power Modules: Challenges and Approaches <i>Mahmoud Saeidi; Jens Friebe; Peter Zacharias</i>
P-B-300	1247	Research on Current Stress Optimization for Dual Active Bridge Converters <i>Minxin Lin; Daniel Legrand Mon-Nzongo; Paul Gistain Ipoum-Ngome</i>

Appendix

A: Conference Information

Venue

Tivoli Chengdu at Cultural Heritage Park, Chengdu, China

Dates

May 17 (Fri) - 20 (Mon), 2024

★ Organized by

China Electrotechnical Society (CES)

★ Co-Sponsored by

IEEE Power Electronics Society (IEEE PELS)

★ ECCE Asia Cooperation

IEEE Industry Application Society (IEEE IAS)
Korean Institute of Power Electronics (KIPE)

★ Hosted by

Southwest Jiaotong University (SWJTU)

● Official Language

The Official Language of the conference is English ,
which will be used for all presentations and printed materials .

● Conference Website

<https://www.ipemc-conf.com/>

● Conference Secretariat Email

ipemc@vip.163.com

B: Venue and Transportation



Tivoli Chengdu at Cultural Heritage Park

No . 601-1 Guanghua Avenue , International Intangible Cultural Heritage Expo Park , Qingyang District , Chengdu

Tivoli Chengdu at Cultural Heritage Park , Tivoli's first 5-star hotel in China . Located in the International Intangible Cultural Heritage Park , this new 201-room luxury hotel in the city's west opens the door to thrilling urban experiences twinned with authentic cultural discoveries . Experience the magic of Tivoli , just 19 kilometers (25 minutes) from Chengdu Shuangliu Airport .

Transportation

Chengdu Shuangliu International Airport: 25 minutes - by car

Chengdu Tianfu International Airport: 59 minutes - by car

Chengdu South Railway Station: 35 minutes - by car

Chengdudong Railway Station: 40 minutes - by car

Subway line 4 Intangible Cultural Heritage Station: 2 minutes - on foot

Crowne Plaza Chengdu Wenjiang:16 minutes - by car



C: Oral and Poster Presentations

Oral Presentation

Oral 1-18 May 19 Morning

Oral 19-34 May 19 Afternoon

Oral 35-56 May 20 Morning

- 1 . There are a total of 56 Oral Sessions . Please confirm the oral time according to the **Paper Presentation Index Table** and **Agenda** .
- 2 . Please arrive in the session room at least 15 minutes before the session .
- 3 . Submit your PPT to the staff of each presentation room before session starts .
- 4 . Present at the assigned time .
- 5 . To keep the sessions running to the set schedule and to allow possible questions from the audience , it is very important to keep presentation within the allocated time .
- 6 . Please check your presentation file in advance of your presentation to ensure your file works properly .
- 7 . If your presentation file contains animations or movies , you are advised to check over technical matters 3 hours prior to your session .

We have volunteers at each oral session room , and if you need help , please feel free to contact us .

Poster Presentation

Poster Presentation A: 17:10-18:10, May 18

Poster Presentation B: 17:00-18:00, May 19

- 1 . Please confirm the poster NO . according to the **Paper Presentation Index Table** .
- 2 . Please ensure that the poster is properly posted 1 .5 hours before the presentation begins .
Poster posting time of presentation A: 12:00~15:30 , May 18 .
Deadline for removing poster A: 11:30 , May 19 .
Poster posting time of presentation B: 12:00~15:30 , May 19 .
Deadline for removing poster B: 21:00 , May 19 .
 Note: If you fail to remove the poster before the deadline , the poster will be disposed of and thrown away by the staff .
- 3 . Please borrow adhesive tape from volunteers for posting . The quantity of adhesive tape is limited , and please return it to volunteers promptly after use .

D: Airport Shuttle Bus

May 17, 2024 Pick-up

The shuttle runs hourly
Departure at a fixed time/Departure at full capacity

Chengdu Tianfu International Airport 成都天府国际机场

11:00-12:00 ↓ **13:30-20:30**



Tivoli & Oaks Chengdu at Cultural Heritage Park 成都非遗博览园缙沃丽酒店



Crowne Plaza Chengdu Wenjiang 成都温江皇冠假日酒店

Bus stop

Chengdu Tianfu International Airport 1F Group bus stop

May 20, 2024 Drop-off

Departure at a fixed time/Departure at full capacity

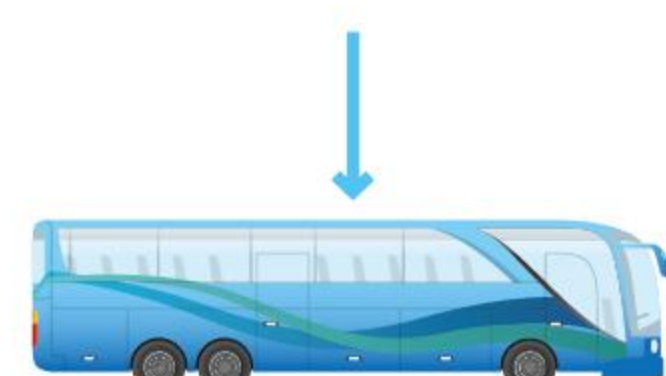
Crowne Plaza Chengdu Wenjiang 成都温江皇冠假日酒店

11:00 12:00 13:00 14:00 15:00



Tivoli & Oaks Chengdu at Cultural Heritage Park 成都非遗博览园缙沃丽酒店

11:30 12:30 13:30 14:30 15:30



Chengdu Tianfu International Airport 成都天府国际机场

Bus stop

Crowne Plaza Chengdu Wenjiang Bus Stop

Tivoli & Oaks Chengdu at Cultural Heritage Park Bus Stop

E: Hotel Shuttle Bus

Please refer to the signage at your hotel for the shuttle bus schedule from the peripheral hotels to the venue.

Peripheral hotels : Crowne Plaza Chengdu Wenjiang , Holiday Inn Express Chengdu Wenjiang Hotspring

F: Contact Information

<u>Accommodation</u>	Emily	199 3803 4731
<u>Venue Agenda</u>	Bin Gou	135 4072 6210
<u>Registration and Others</u>	Jixiang Wang	157 5187 1715



中国电工技术学会
China Electrotechnical Society

China Electrotechnical Society

Founded in 1981, China Electrotechnical Society (CES) is the leading academic, non profitable national society of Electrical Engineering.

With over 50,000 individual members including 6,000 senior members, more than 1500 group members, 11 working committees, 64 technical divisions and 18 provinces and municipality's sections, CES has set up a high-end academic exchange platform for Scientific researchers, experts, technicians, enterprise managers who are engaged in the field of Electrical Engineering. The Main Activities of CES are:

- Host academic Conference
- International Cooperation
- Publication
- Education and Accreditation
- Science Popularization
- CES Science & Technology Reward and Other Rewards Works
- Release Standards
- Exhibition
- Consulting

The headquarter of CES is located in Beijing and executed the resolutions carry by the council of CES. The National Members Congress (NMC) is the highest leadership organizations of CES and the Council and the standing council is as the governing body of CES. There are 195 elected directors and 59 elected executive directors including 12 academicians in the newest Council (the 9th) of CES.

To foster technological innovation, to advocate open, equal and mutually beneficial cooperation and to provide a full range of services to our members is the core purpose of CES.



西南交通大学
Southwest Jiaotong University

Southwest Jiaotong University

Founded in 1896 as the "Imperial Chinese Railway College", Southwest Jiaotong University (SWJTU) is the first institution of higher engineering education in China. It has become known as "the cradle of railway engineers in China".

SWJTU was founded to train China's own railway engineers. Since our early days, we have been cultivating talents for the rejuvenation of Chinese nation and persevering in self-improvement with the motto "Diligence, Ambition, Tenacity and Loyalty". By training our graduates to master cutting-edge technologies and to strive for excellence, we have been shaping the development of China's rail transit industry from the beginning. We have more than 300,000 graduates whose ideas, innovations and actions have generated a positive impact in China and the world.

As an outstanding academic community, it has always been our mission to serve the country and the world through scientific education, research, and innovation, to solve fundamental scientific problems and to meet the challenges of today and tomorrow.

SWJTU is situated in Chengdu, Sichuan's capital, and is known as the home of the beloved Panda Bear. Our hometown, a "garden city" is regarded as one of the metropolitan cities with the highest quality of life in China. Furthermore, since it is a key node city along the "Belt and Road", SWJTU is well positioned to adopt a global vision, with partners, cooperation projects, and alumni spanning the globe. Our growing scientific community attracts talents from all over the world and our students have opportunities to study, research, and work with outstanding and multidisciplinary teachers, alumni, and partners. Both rigorous and dynamic, the academic environment provides outstanding opportunities for the integration of theory and practice. As a member of the innovative, cooperative, and multidisciplinary community at SWJTU, you will have the chance to work in a community that serves as a key node of the Belt and Road Initiative, address the greatest global engineering challenges of today, and make a positive impact on the field of higher education with us. In addition, you can experience and enjoy our welcoming culture, highly praised by our international guests and visitors.



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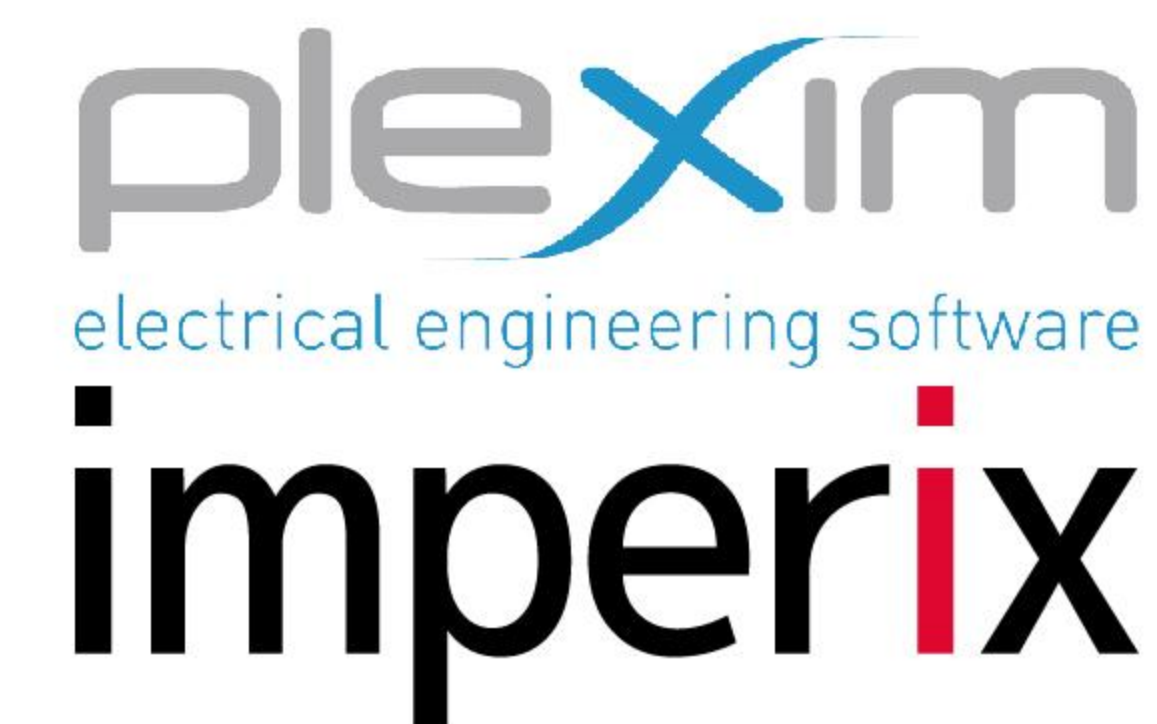


Exhibitor



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 Exhibitor



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 Exhibitor



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上海汉象智能科技有限公司
<http://hanxiang-tech.com/>

“零代码”开发平台引领者

ZERO CODE DEVELOPMENT PLATFORM LEADER



南京瑞途优特信息科技有限公司 (RTUNIT®) 成立于2016年，是一家专注于图形化可编程序控制器及电机驱动控制、电力电子、工业自动化等相关技术领域的国家高新技术企业。

瑞途优特于2018年推出了国内第一款自主研发的实时数字控制器RTU-BOX，支持SIMULINK模型和C语言两种开发模式。其丰富的硬件资源、迭代改进的系统性能、符合国人使用习惯的软件以及完善的本土化服务得到了越来越多用户的肯定与支持。公司还拥有RTM系列积木式电力电子功率模块，RTI系列集成式驱动器、RTP系列高功率密度电源等多个产品系列，并可提供基于这些产品的一整套解决方案和相关配套服务。

瑞途优特是一个技术专业、拥有梦想、充满活力、团结奋进的团队，始终坚持自主研发、持续创新、严控质量、用心服务的理念，不断追求“让控制简单高效！”。

产品目录

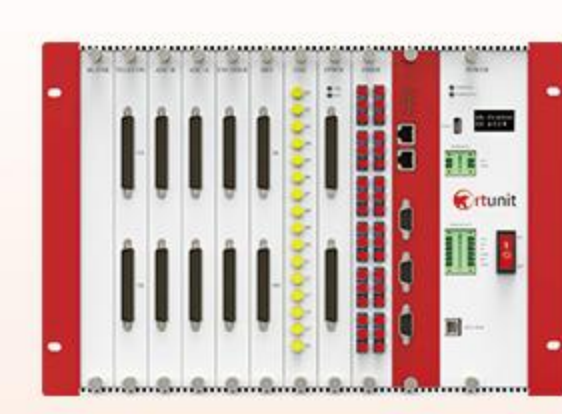
实时数字控制器



RTU-BOX201



RTU-BOX205



RTU-BOX206

积木式功率模块



RTM-PEF4025IF-2.0
IGBT
400V-25A/全桥



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



RTM-PEH8025IF-2.0
IGBT
800V-25A/半桥



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



RTM-PEN8025IF-2.0
IGBT
800V-25A/I型



RTM-PET8025IF-2.0
IGBT
800V-25A/T型

电源及其它



DC: 电流30A~2040A
单机电压80V~2250V
功率5KW~144KW



AC: 电源3A~30A
单机电压300~600V
频率45~10000HZ



三相逆变器 RTI-INV8040IR
IGBT/三相全桥



并网滤波器 RTF
L, F可定制

项目案例

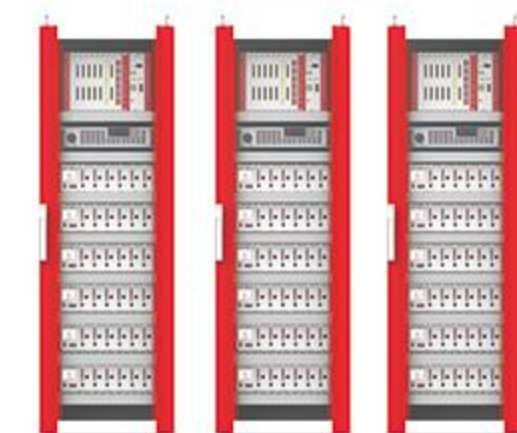
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新能源-风力发电开发平台



模块化多电平变流器



桌面式新能源微网系统



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- 电网模拟器
- 高精度源表SMU

测试系统

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

解决方案与应用

- 电源/电池测试解决方案
- 半导体/工业电子/LED 测试解决方案
- 光伏/智能电网测试解决方案
- 新能源/汽车电子测试解决方案
- 5G通讯/IOT/医疗电子测试解决方案
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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，受到行业内外广泛关注。

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- ◆ 微电网
- ◆ 多电平电力电子装置
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广州德肯电子股份有限公司(Pintech品致)总部位于广州市联东U谷黄埔科技总部港，公司成立于2006年，是一家专注于电子测量测试仪器仪表产品研发、制造及销售的高新技术企业。公司已在广东股权交易中心挂牌（股权代码：880555），荣获“高新技术企业”、“省级专精特新企业”、“科技型中小企业”等多个荣誉称号，并与华南理工大学合作成立研究生实习基地。



Pintech品致为广州德肯电子股份有限公司旗下品牌。Pintech品致，仪器仪表著名品牌，示波器探头技术标准倡导者，国内自主研发第一家，“两点浮动”电压测试创始人，与华为、比亚迪、西门子等企业以及国内各大知名高校建立供应合作关系。“Pintech品致”商标，“品致”两字取之《易经》坤卦第二章“品物咸亨”“至哉坤元”中的“品至”二字，至谐音致，蕴含精雕细琢出精品，视产品的品质为生命之含义。



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更低的本底噪声
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存储深度 通道
360Mpts 4CH

14 英寸触摸屏
1920*1200 分辨率

型号	MHO 3 系列	MDO 系列
垂直分辨率	12 位	8 位
可选带宽	250MHz, 350MHz, 500MHz	

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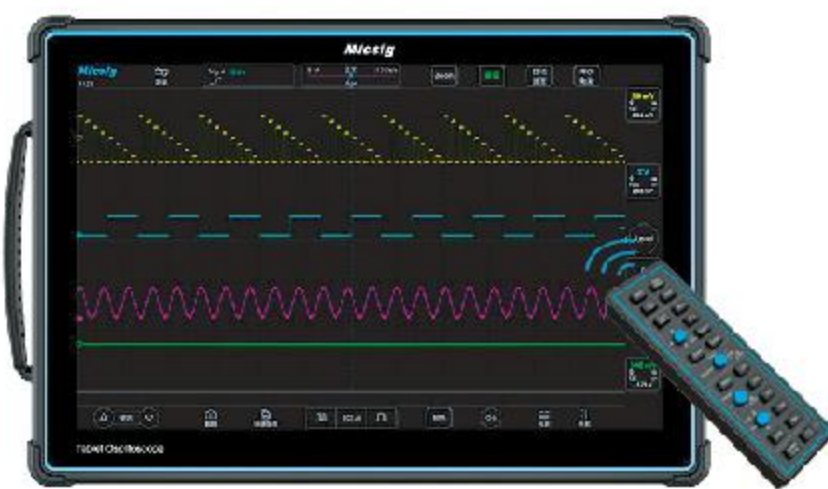
共模抑制比高达 180dB

带宽 共模电压 供电方式
DC~1GHz 85kVpk 激光供电
DC 精度 差模电压 接口
1% 高达 ±6250V 通用 BNC

型号	MOIP100P	MOIP200P	MOIP350P	MOIP500P	MOIP800P	MOIP1000P
带宽	100MHz	200MHz	350MHz	500MHz	800MHz	1GHz
上升时间	≤ 3.5ns	≤ 1.75ns	≤ 1ns	≤ 700ps	≤ 438ps	≤ 350ps
共模抑制比	DC: 180dB 100MHz: 128dB	DC: 180dB 200MHz: 122dB	DC: 180dB 350MHz: 118dB	DC: 180dB 500MHz: 114dB	DC: 180dB 800MHz: 110dB	DC: 180dB 1GHz: 108dB
差模电压	±6250V			±5000V		
底噪	< 0.45mVrms					
直流增益精度	1%					
共模电压	85kVpk					

平板示波器

ETO/TO/STO系列



便携 专业 易用
10.1 英寸和 14 英寸全触控屏
支持无线手柄操作
8 英寸触控屏 + 旋钮设计
全系列内置电池、方便拆卸

型号	ETO 系列	TO 系列	STO 系列
带宽	350~500MHz	100~300MHz	100~200MHz
实时采样率	3GSa/s	1~2GSa/s	1GSa/s
存储深度	360Mpts	110~220Mpts	70Mpts

高压差分探头 MDP 系列



超低底噪, 小巧外观
用于高压电源、电机驱动等浮地测试
带宽: 高达 500MHz 差分电压: 高达 7000Vpk
衰减系数: 20X/200X, 50X/500X, 100X/1000X

带宽 / 型号	最大差分输入电压 (DC+AC PK)				共模抑制比
	70V (20X) 700V (200X)	150V (50X) 1500V (500X)	300V (100X) 3000V (1000X)	700V (100X) 7000V (1000X)	
100MHz	MDP700	MDP1500	MDP3000	DP7000	DC: > -80dB 100kHz: > -60dB 10MHz: > -30dB 100MHz: > -26dB
150MHz	MDP701	MDP1501	MDP3001	/	
200MHz	MDP702	MDP1502	MDP3002	/	
300MHz	MDP703	MDP1503	MDP3003	/	DC: > -80dB 100kHz: > -70dB 20MHz: > -40dB 120MHz: > -26dB
400MHz	MDP704	MDP1504	MDP3004	/	
500MHz	MDP705	MDP1505	MDP3005	/	

柔性电流探头 RCP 系列



线圈截面直径仅 1.6mm (可定制)
MOSFET, IGBT 管脚轻松测量
带宽: 高达 30MHz 测量电流: 高达 6000Apk
典型精度: 1%

高频交直流电流探头 CP 系列



双量程设计 满足各种测试需求
带宽: 高达 100MHz 直流精度: 1%
量程: 6A/30A

低频交直流电流探头 CP2100 系列



耐用可靠, 测试方便
BNC 接口, 适配所有品牌示波器
带宽: DC~2.5MHz 供电: 5V DC
可测最大电流: 100Apk (70Arms)

交流电流探头 ACP1000



夹钳设计 不必断开被测电路
测试电流范围: 0.1A~1000A
最大一次电流: 2000A (2秒) 最高精度: 1%

汽车诊断示波器 ATO/SATO 系列



预设汽车诊断功能 支持所有车型
内置电池更加方便车身检测
体积小重量轻、外出测试更加便捷

型号	ATO 系列	SATO 系列
带宽	100~300MHz	100~200MHz
实时采样率	1~2GSa/s	1GSa/s
存储深度	110~220Mpts	70Mpts

分体式示波器 VTO/VATO 系列



极致便携 测量随时随地
支持 CAN、LIN 总线解码
VATO 系列内置多种汽车诊断专业功能

型号	VTO2004	VATO2004
带宽	200MHz	200MHz
实时采样率	1GSa/s	1GSa/s
存储深度	50Mpts	50Mpts

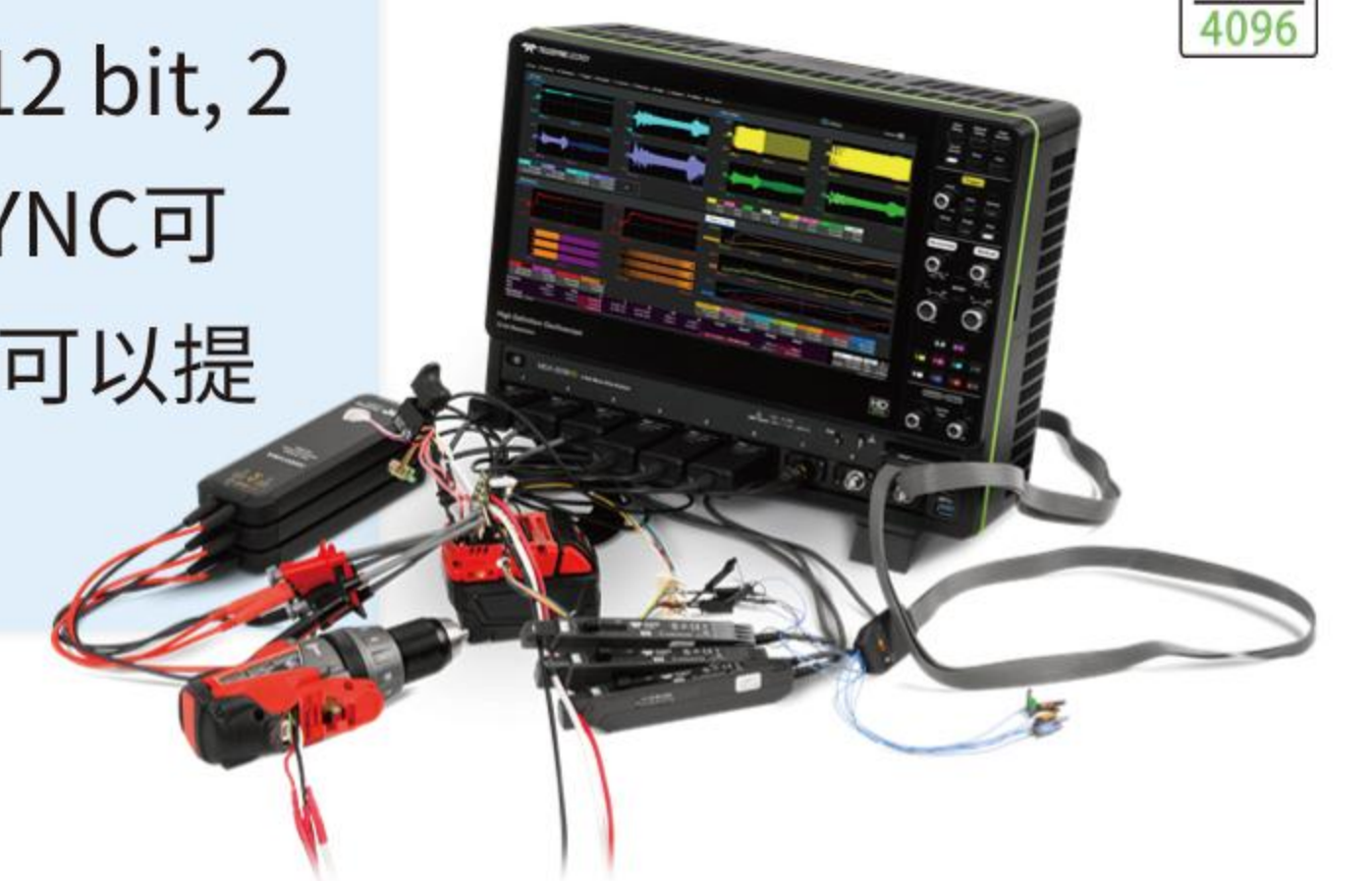
宽禁带功率半导体测试方案

特励达力科HD系列高精度示波器可始终保持12-bit 性能, 不会降低带宽或采样率, 噪声更低, 精度更高, 带宽范围覆盖200 MHz 至 65 GHz, 具有 4 至 8 个通道, 适合多种不同的应用。



HDO 6000B WaveRunner 8000HD WaveMaster 8000HD WavePro HD WaveSurfer 4000HD

WaveRunner8000 HD高精度示波器是业内唯一的8通道, 12 bit, 2 GHz 示波器。提供更多通道、更多灵活性, 利用OscilloSYNC可组成16通道系统, 且无模拟通道和数字通道的折中。而且可以提供最长5 Gbps的存储深度, 捕获长时间发生的事件。



DL-ISO 高压光隔离探头

- GaN和SiC测试的理想探头
- 最好的信号保真度
- 最高测量精度
- 丰富的连接方式

ABOUT US

特励达力科 (Teledyne LeCroy) 是高端示波器、协议分析仪和其他测试仪器的领先制造商, 可快速全面地验证电子系统的性能和合规性, 并进行复杂的调试分析。

1964 年成立以来, 公司一直专注于将强大的工具整合到创新产品中, 以提高“洞察时间”。更快的洞察时间使用户能够快速查找和修复复杂电子系统中的缺陷, 从而显著缩短产品的上市时间。

