

# Detailed Agenda

## Day1: Oct. 28th

Time	Content
08:30-12:00	<b>T1: GaN power devices: Technology, characterizations and reliability</b>  <b>Instructor Team:</b> <i>Prof. Shu Yang, Zhejiang University</i> <b>Room: Qiushi Hall</b>
	<b>T2: A comprehensive introduction of silicon carbide devices: packaging and driving</b>  <b>Instructor Team:</b> <i>Prof. Alan Mantoath, University of Arkansas</i> <i>Prof. Helong Li, Hefei University of Technology</i> <i>Prof. Shuang Zhao, Hefei University of Technology</i> <b>Room: Ziwei Hall</b>
	<b>T3: Use of FBG sensors for the fully automated condition monitoring of the health of tracks and running gear of trains based on a case study of the Train Track Condition Monitoring system currently operating in SMRT, Singapore</b>  <b>Instructor Team:</b> <i>Prof. Kang Kuen LEE, The Hong Kong Polytechnic University</i> <b>Room: Guiyu Hall</b>
12:00-13:30	Lunch Restaurant (1F)

Time	Content
14:00-17:30	<p><b>T4: Second Harmonic Current Reduction Techniques for Two-Stage Single-Phase Converters</b></p> <p><b>Instructor Team:</b>  <i>Prof. Xinbo Ruan, Nanjing University of Aeronautics and Astronautics</i>  <i>Prof. Fei Liu, Nanjing University of Aeronautics and Astronautics</i></p> <p><b>Room: Qiushi Hall</b></p>
14:00-17:30	<p><b>T5: Advanced control, stability and reliability of vehicular electric power systems</b></p> <p><b>Instructor Team:</b>  <i>Prof. Fei Gao, Shanghai Jiao Tong University</i>  <i>Prof. Qianwen Xu, KTH Royal Institute of Technology</i></p> <p><b>Room: Ziwei Hall</b></p>
	<p><b>T6: Electromagnetic Vibrations and Interference of Multiphase PM Motors: Mechanism, Analysis and Mitigation</b></p> <p><b>Instructor Team:</b>  <i>Prof. Siwei Cheng, Naval University of Engineering</i>  <i>Dong Jiang, Huazhong University of Science and Technology</i></p> <p><b>Room: Guiyu Hall</b></p>
18:00-19:00	<p>Dinner</p> <p>Haichao Hall(-1F)</p>

## Day2: Oct. 29th

Time	Content
08:00-08:30	<b>Opening ceremony</b> Juanhu Hall
08:30-10:00	<b>Plenary session 1 (3 talks)</b> Juanhu Hall <i>Chair: Prof. Dehong Xu, Zhejiang University</i>
08:30-09:00	<b>Technologies and Challenges for Electrification of Aircraft Propulsion Systems</b> <i>Prof. Pat Wheeler, University of Nottingham, UK and University of Nottingham-Ningbo</i>
09:00-09:30	<b>Electric Vehicle On-Board Solar Generation: Motivation, Benefits, and Challenges</b> <i>Dr. Jennifer Bauman, McMaster University, Canada</i>
09:30-10:00	<b>Industry Status and Frontier Technical Challenges of Vehicular e-Powertrains</b> <i>Prof. William Cai, Harbin University of Science and Technology</i>
10:00-10:30	Tea Break Juanhu Hall
10:30-12:00	<b>Plenary session 2 (3 talks)</b> Juanhu Hall <i>Chair: Prof. Jianxin Shen, Zhejiang University</i>
10:30-11:00	<b>The Levitation System and the Linear Traction System of the 160 km/h Maglev Train</b> <i>Dr. Laisheng Tong, CRRC</i>
11:00-11:30	<b>Innovation of New Urban Rail Transit System Based on Guided Bus</b> <i>Dr. Xing Xing, Beijing Urban Construction Design &amp; Development Group Co., Limited</i>

11:30-12:00 **Challenges in Solid State Transformer Design for Electric Vehicle Charging Infrastructures**

*Dr. Cheng Luo, Eaton Research Labs*

12:00-13:30 Lunch Haichao Hall(-1F)

**Dialogue Sessions I (35 papers)**

13:30-15:15

Juanhu Hall

*Chair: Lijun Hang, Hangzhou Dianzi University  
Xiaoyan Huang, Zhejiang University*

15:15-15:45 Tea Break Juanhu Hall

**IS-29-1 Device and Gate Driver Design**

QIUSHI HALL

15:45-17:45

*Chair: Shuang Zhao,  
Hefei University of Technology  
Yuanbin He, Hangzhou Dianzi University*

**IS29-1-1**

15:45-16:15

**Benefits and Challenges of using SiC technology on electric vehicles**

*Xu Devin, Infineon Technologies (China) Co., Ltd.*

**IS29-1-2**

16:15-16:45

**Power Semiconductor Solutions for Rail Traction and xEV**

*Lu Siqing, Mitsubishi Electric & Electronics(Shanghai) Co., Ltd.*

**IS29-1-3**

16:45-17:15

**Technology trends of SiC power devices in 800 EV application**

*Yang Lei, PN Junction Semiconductor*

## **TS-29-1 Battery and Load Modeling**

ZIWEI HALL

15:45-17:25

*Chairs: Qiang Yang, Zhejiang University  
Yongheng Yang, Zhejiang University*

### **TS29-1-1**

15:45-16:05 **A Hybrid Data-Driven and Model-based Method for Modeling and Parameter Identification of Lithium-Ion Batteries**

*Bin Gou, Yan Xu, Xue Feng*

### **TS29-1-2**

16:05-16:25 **Thermally and electromagnetically driven flow in liquid metal battery and their effects on ionic /atomic transport**

*Chenglian Gao, Xianbo Zhou, Haomiao Li, Kangli Wang*

### **TS29-1-3**

16:25-16:45 **Numerical Analysis of Flow Type and Direction on Single Phase Immersion Cooling for Li-ion Battery Thermal Management**

*ZhiCheng Xin, Weiyu Tang, Wei Li, Kuang Sheng, Zan Wu*

### **TS29-1-4**

16:45-17:05 **SOC Estimation for a Li-ion battery based on the AEKF optimized by GA-BP Neural Network**

*Senlei Wang, Fangang Meng, Huaqiang Zhang*

### **TS29-1-5**

17:05-17:25 **Aggregated Load Uncertainty Analysis Through Unsupervised Learning**

*Yishen Wang, Bo Chai, Siyan Liu, Mingyue Wei, Fei Zhou*

## **TS-29-2 Charging Technologies I**

GUIYU HALL

15:45-17:25 *Chair: Zhijian Fang, China university of  
Geosciences  
Guangdi Li, Northeastern University*

### **TS29-2-1**

#### **Design and Analysis of Wireless**

15:45-16:05 **Electric Vehicle Energy Network**

*Wei Liu, K.T. Chau, Calvin C.T. Chow, Chaoqiang  
Jiang*

### **TS29-2-2**

#### **Power control study of dynamic wireless charging system based on resonant point switching**

16:05-16:25

*Chengliang Wang, Zhigang Chen, Haiyan Zheng,  
Qingsheng Yang*

### **TS29-2-3**

#### **Analysis and Design of Misalignment Tolerant PS/SP Compensation Topologies for IPT System**

16:25-16:45

*Kang Wu, Yijie Wang, Jianwei Mai, Dianguo Xu*

### **TS29-2-4**

#### **Short-Term Forecasting of EV Charging Load Using Prophet-BiLSTM**

16:45-17:05

*Chenghan Li, Yipu Liao, Linhong Zou, Ruisheng  
Diao, Rongjia Sun, Huan Xie*

### **TS29-2-5**

#### **A Novel AI-based Method for EV Charging Load Profile Clustering**

17:05-17:25

*Shilong Shen, Yihan Huang, Ruisheng Diao, Shuai  
Lu, Da Meng, Gang Zhang*

## **TS-29-3 Electrified Transportation**

Zhuyun Hall

15:45-17:25

*Chair: Lijun Hang, Hangzhou Dianzi University  
Tianfu Sun, Chinese Academy of Sciences*

### **TS29-3-1**

#### **A High Precision Resolver-to-Digital Conversion Method With Pre-filtering**

15:45-16:05

#### **DDSRF Used in Electric Vehicle**

*Shuo Wang, He Zhang, Yuli Bao, Vasyl Varvolik,  
Dmytro prystupa, Giampaolo Buticchi, Jing Li,  
Xiaochen Zhang*

### **TS29-3-2**

#### **Design of A Doubly-Fed Linear Motor based on Three-Phase Stator and Five-Phase Mover for Maglev Applications**

16:05-16:25

*Minglei Yang, Zhongshu Shao, Yeqin Wang, Zaimin  
Zhong, Qinghao Xiao*

### **TS29-3-3**

#### **An Online Diagnosis Method for EMU Traction Transformer Winding Faults Based on Voltage and Current Signals**

16:25-16:45

*Xiao Tang, Jinsong Kang*

### **TS29-3-4**

#### **Multi-objective optimization of high-speed train running speed trajectory based on particle swarm and NSGA-II fusion algorithm**

16:45-17:05

*YuanLin Guo, Lin Qiu, JiEn Ma, Jian Zhang,  
YouTong Fang*

**TS29-3-5**  
**Real-time Vehicle Velocity Prediction**  
**Strategy under Highway**  
**Vehicle-to-vehicle Environment**  
17:05-17:25  
*Ziyan Zhang, Dongwei Yao, Feng Wu, Junhao Shen*

**TS-29-4 Energy Storage Systems**  
15:45-17:25  
Bihe Hall  
*Chair: Qian Xiao, Tianjin University*  
*Hengzhao Yang, ShanghaiTech University*

**TS29-4-1**  
**Joint Operation Strategy of**  
**Electrochemical Energy Storage**  
**Station Participating in Multi-type**  
**Electricity Market**  
15:45-16:05  
*Kan Yang, Qiuji Sun, Hengjian Fan, Junjie Li,*  
*Yizheng Wang, Weiwei Zhang*

**TS29-4-2**  
**Integrated Power/Signal Transmission**  
**in Triple Active Bridge Converters**  
**Based on Partial Power Processing for**  
**Energy Routers**  
16:05-16:25  
*Yu Nie, Yixuan Zhang, Yihua Hu*

**TS29-4-3**  
**Optimal Sizing of On-board and**  
**Wayside Energy Storage Systems for**  
**Braking Energy Recovery**  
16:25-16:45  
*Jiayu Mi, Zhongping Yang, Zhihong Zhong, Fei Lin,*  
*Chuanfei Diao, Ting You*



**TS29-4-4**

**Frequency Response and Fault Ride**

**16:45-17:05 Through of a Novel MMC Based Hybrid  
Energy Storage System**

*Minfu A, Yixuan Fang, Zaixin Yang, Baiqing Yin,  
Pengfei Hu*

18:00-19:00 Dinner

Haichao Hall(-1F)

## Day3: Oct. 30th

Time	Content
08:00-10:00	<b>IS-30-1 EV Controller Design</b> QIUSHI HALL <i>Chair: Huafeng Xiao, Southeast University</i> <i>He Zhang, University of Nottingham Ningbo China</i>
08:00-08:30	<b>IS30-1-1</b> <b>EV high voltage on board charging system discussion</b> <i>Yuwei Liu, Suzhou Inovance Automotive Co., Ltd.</i>
08:30-09:00	<b>IS30-1-2</b> <b>Design Challenges and Development Trends of Sic Controller for Fuel Cell High Speed Air Compressor</b> <i>Li Xiang, ZINSIGHT Technology (Shanghai) Co., Ltd</i>
09:00-09:30	<b>IS30-1-3</b> <b>Highly Integrated EV Traction Inverter family Using Paralleling Power Semi-conductors</b> <i>Wenjie Chen, Sungrow E-power</i>
08:00-09:40	<b>TS-30-1 Control of Permanent Magnet Synchronous Motors I</b> ZIWEI HALL <i>Chair: Huipin Lin, Hangzhou Dianzi University</i> <i>Chenwei Ma, Southwest Jiaotong University</i>
08:00-08:20	<b>TS30-1-1</b> <b>A Model-free Predictive Current Control for PMSM Driving System of EV with Adjustable Low Inertia</b> <i>Yao Wei, Shuaicheng Men, Yanjun Wei, Hanhong Qi, Fengxiang Wang</i>

08:20-08:40 **TS30-1-2**  
**Adaptive Periodic Disturbance Observer  
Based on Fuzzy-Logic Compensation  
for PMSM Control System**  
*Chenxin Jiang, Yunchong Wang, Tan Long,  
Xiaoyan Huang*

08:40-09:00 **TS30-1-3**  
**A New Composite Sensorless Control  
Strategy for PMSM Used in Electric  
Vehicle**  
*Jiwei Huang, Xinkai Zhu, Yonggang Li ,Guangyu  
Qi, Yucai Wu, Yuling He*

09:00-09:20 **TS30-1-4**  
**Three-stage Series Model Predictive  
Torque Control for PMSM Drives**  
*Xiaoguang Zhang, Guofu Zhang, Xu Gao*

09:20-09:40 **TS30-1-5**  
**Power Decoupling Control of  
Permanent Magnet Generating System**  
*Qingling Luo, Xuanlyu Wu, Bei Wang, Jingru Yang,  
Xiaohua Wu*

08:00-09:40 **TS-30-2 Charging Infrastructure,  
Vehicle-Grid Interaction GUIYU HALL**  
*Chair: Qiang Yang, Zhejiang University  
Qian Xiao, Tianjin University*

08:00-08:20 **TS30-2-1**  
**Solving the 90% Infrastructure Energy  
Challenge for Passenger Electric  
Vehicles**  
*Philip Krein*

08:20-08:40 **TS30-2-2**  
**Grid-connected Converter with Very Low Harmonic Content applied to Extreme Fast Charging Stations for Multiple Vehicles**  
*Dener de Lisboa Brandão, Thiago Morais Parreiras, Igor Amariz Pires, Braz Cardoso Filho*

08:40-09:00 **TS30-2-3**  
**Behavior Modeling of Lightning Overvoltage and MOA based Protection for Floating Ground SST**  
*Jiatong Zhang, Jianxiong YU, Yajie Tang, Jiajie Duan, Chushan Li, Wuhua Li*

09:00-09:20 **TS30-2-4**  
**An Inertia Adjustment Control Strategy of Grid- Forming Electric Vehicle for V2G Application**  
*Hang Li, Zhini Yin, Feng Jiang, Junfei Han, Yuqiang Wang, Yifan Zhang, Chaoyu Yu, Min Chen*

09:20-09:40 **TS30-2-5**  
**Research on master-slave game economic operation strategy of load aggregators participating in electric logistics vehicle**  
*Chenlei Cui, Rongjing Cui, Chunhai Dong, Jianxiang Wang, Deju Zhang, Su Su, Dong Xia*

08:00-09:40 **TS-30-3 SiC MOSFETs and GaN HEMTs**  
Zhuyun Hall  
*Chair: Helong Li, Hefei University of Technology  
Fei Liu, Nanjing University of Aeronautics and Astronautics*

08:00-08:20 **TS30-3-1**  
**A Novel Crosstalk Suppression Driving Circuit for SiC MOSFET based on Negative Voltage Level Shift**  
*Xiang Zheng, Lijun Hang, Qingwei Zeng, Dong Yan, Yuanbin He, Zhen He, Pingliang Zeng*

08:20-08:40 **TS30-3-2**  
**A method for SiC MOSFETs gate oxide degradation monitoring based on turn-on di/dt-delay time**  
*Jianlong Kang, Qiang Wu, Yu Chen, He Xu, Haoze Luo, Zhen Xin*

08:40-09:00 **TS30-3-3**  
**Influence of Gate Driver Loop Inductance on SiC MOSFET Module Turn-on Gate Voltage Oscillation in High Power Application**  
*NianZun Qi, Dongxin Jin, Xinglai Ge, Cheng Luo*

09:00-09:20 **TS30-3-4**  
**Overcurrent Test for GaN HEMT with Cryogenic Cooling**  
*Yuqi Wei, Md Maksud Hossian, H. Alan Mantooth*

09:20-09:40 **TS30-3-5**  
**Characterization of Low-Temperature for SiC MOSFET Based On the Capacitance-Voltage**  
*Xiaofeng Ding, Yujia Zhao, Yanyong Yang*

08:00-09:40 **TS-30-4 Inductors, Transformers and Other Components** Bihe Hall  
*Chiar: Bo Yang, Xi'an University of Technology*  
*Shuang Zhao, Hefei University of Technology*

**TS30-4-1**  
**Experiment Research of the  
Electromagnetic Immunity  
Performance of the Electronic Current  
Transformer Card under Extreme  
Temperature**  
*Guanchen Liu*

**TS30-4-2**  
**A Loss Measurement Approach of  
Power Magnetic Components under  
Practical Power Electronics  
Conditions**  
*He Xu, Jiazhan Dong, Chushan Li, Yuanhong  
Wang, Ying Mei, Jingkui Shi, Menglian Zhao*

**TS30-4-3**  
**A Novel Hybrid DC Circuit Breaker  
with Current Limiting Capability**  
*Xiaoyi Xu, Zhujian Qu, Xinan Wu, Dongdong  
Huang, Guanlong Jia, Xiaoming Liu*

**TS30-4-4**  
**Calculation Method for Inductance  
Value of Multi-Material Powder Cores  
Inductor Considering Their DC  
Superimposition Characteristic**  
*Yun Zhang, Zedong Zheng, Chi Li*

**TS30-4-5**  
**Lumped-Parameter Equivalent Circuit  
Models of a Multi-Winding  
Transformer for DAB and MAB  
Applications**  
*Chunyang Gu, Yicong Cai, Jiajun Yang,  
Giampaolo Buticchi*

09:40-10:15	Tea Break	Juanhu Hall
10:15-12:00	<b>Dialogue Sessions II (35 papers)</b> <i>Chair: Yuanbin He, Hangzhou Dianzi University Tianfu Sun, Chinese Academy of Sciences</i>	Juanhu Hall
12:00-13:30	Lunch	Haichao Hall(-1F)
13:30-15:30	<b>IS-30-2 Modeling, Simulation and Testing</b> <i>Chair: Hengzhao Yang, ShanghaiTech University Yongheng Yang, Zhejiang University</i>	QIUSHI HALL
13:30-14:00	<b>IS30-2-1 Hardware-in-loop'based Power Electronics Converter Fast Design System</b> <i>Chi Zhang, Hangzhou Firstack Technology Co., Ltd.</i>	
14:00-14:30	<b>IS30-2-2 Application of HIL in motor drive control</b> <i>Qiming Zhang, ModelingTech Energy Technology Co., Ltd.</i>	
14:30-15:00	<b>IS30-2-3 Modular power electronics research platform based on model design</b> <i>Weigang Gu, Nanjing rtunit Technology Ltd. CO</i>	
15:00-15:30	<b>IS30-2-4 Opportunities and Challenges for Power Electronics Test Solutions</b> <i>Yucai Liu, ZHIYUAN Electronics</i>	

## **TS-30-5 Power Converters**

ZIWEI HALL

13:30-15:10

*Chair: Taiying Zheng, Zhejiang University  
Xiaoliang Jin, Nanjing Institute of Technology*

### **TS30-5-1**

13:30-13:50

#### **Design and Modeling of CLLC Converter for Bidirectional On-Board Charger**

*Zheng Bai, Jingwei Shao, Jingyun Gu, Hao Liu, Xiangjun Zhang, Dianguo Xu*

### **TS30-5-2**

13:50-14:10

#### **Design of Onboard 270V/28V DAB Converter for Optimized Parasitic Parameters**

*Hao Wang, Liangjie Jiang, Xuanlyu Wu, Mingrui Shao, Xiliang Chen, Xiaohua Wu*

### **TS30-5-3**

14:10-14:30

#### **Open-Circuit Fault Diagnosis for Three-Level ANPC Inverter Fed PMSM Drives with Model Predictive Control**

*Guohua Li, Shuai Xu, Chunxing Yao, Guanzhou Ren, Guangtong Ma*

### **TS30-5-4**

14:30-14:50

#### **Investigation of Hybrid Three-Level Hybrid Device (Hybrid2) Active Neutral-Point-Clamped Converter**

*Tianlun Xia, Qinsong Wang, Huan Yang, Chushan Li, Wuhua Li, Xiangning He*



14:50-15:10 **TS30-5-5**  
**Active RC Auxiliary Circuit With  
Parameter Switching Scheme for  
Stabilization and Transient Mitigation  
of Cascaded DC/DC Systems**  
*Yufei Si, Zhenyu Shan*

13:30-15:10 **TS-30-6 Resonant Converters**  
GUIYU HALL  
*Chair: Zhijian Fang, China university of  
Geosciences*  
*Fei Liu, Nanjing University of Aeronautics and  
Astronautics*

13:30-13:50 **TS30-6-1**  
**Limitations and Solutions of LLC  
Topology in High Power High Step-up  
Applications on Aircraft**  
*Shuangyi Zhong, Xuanlyu Wu, Bei Wang, Xin  
Zhao, Xiliang Chen, Xiaohua Wu*

13:50-14:10 **TS30-6-2**  
**Minimum current optimization of  
DBSRC considering dead time effect**  
*Jiawen Yang, Yu Zhang, Xinmi Wu*

14:10-14:30 **TS30-6-3**  
**High-Frequency Integrated Magnetics  
Design for Onboard LLC Converter  
Utilizing 4-Layer PCB**  
*Mingrui Shao, Xuanlyu Wu, Bei Wang, Xiliang  
Chen, Xin Zhao, Xiaohua Wu*

14:30-14:50 **TS30-6-4**  
**LLC Resonant Converter Based on High-speed Train Charger**  
*Hongjin Zhang, Li Zeng, Xiaoqiong He*

14:50-15:10 **TS30-6-5**  
**High Power High Step-Up LLC Resonant Converter With Multimode For Aircraft Applications**  
*Xuanlyu Wu, Shuangyi Zhong, Bei Wang, Xin Zhao, Xiliang Chen, Xiaohua Wu*

13:30-15:10 **TS-30-7 Fault-Tolerant Control of Motor Drives** Zhuyun Hall  
*Chair: Huipin Lin, Hangzhou Dianzi University*  
*Zhixun Ma, Tongji University*

13:30-13:50 **TS30-7-1**  
**An optimal short-circuit current control method for self-synchronization controlled wind turbines**  
*Zhenyan Deng, Han Wan, Yao Qin, Seiki Igarashi, Jun Li, Xu Cai*

13:50-14:10 **TS30-7-2**  
**Integrated Four-leg Inverter Structure For PMSM Drives with Open-phase Fault-tolerance and Internal Boost Operation**  
*Xiaokang Zhang, Junjie Zhao, Jean-yves Gauthier, Xuefang Lin-Shi, Fei Wang*

14:10-14:30 **TS30-7-3**  
**An Online Global Fault-Tolerant Control Strategy for Asymmetrical Multiphase Machines With Minimum losses in Full Torque Operation Range**  
*Shusen Ni, Zedong Zheng, Jiawei Sun*

14:30-14:50 **TS30-7-4**  
**Open-Circuit Fault-Tolerant Control of Five-Phase PMSM Drives**  
*Wentao Huang, Minjie Huang, Liyan Luo, Jiachen Du, Xiaofeng Zhu*

14:50-15:10 **TS30-7-5**  
**Fault-Tolerant Control of Standard Three-Phase PMSM Drives Considering Copper Loss**  
*Xueqing Wang, Shaowei Ren, Jianwei Shen, Zifan Zhang, Yao Mao, Zheng Wang*

13:30-15:10 **TS-30-8 Energy Conversion Systems**  
Bihe Hall  
*Chair: Huafeng Xiao, Southeast University*  
*Zan Wu, Zhejiang University*

13:30-13:50 **TS30-8-1**  
**Analysis and Design of Passive Damping for LCEquipped Permanent-Magnet Synchronous Machine Drive System**  
*Zekai Lyu, Lijian Wu, Youtong Fang*

13:50-14:10 **TS30-8-2**  
**Investigation of An Integrated Battery  
Charger for EVs based on A  
Dual-Motor Traction System**  
*Minghao Tong, Xiaoqiang Liu, Le Sun, Zhiyuan  
Xu, Ming Cheng, Quan Zou*

14:10-14:30 **TS30-8-3**  
**Voltage Distribution Analysis of High  
dv/dt Fed Machines Using High  
Frequency Winding Model**  
*Chenyue Zhang, Yunchong Wang, Tan Long,  
Xiaoyan Huang*

14:30-14:50 **TS30-8-4**  
**A New Vernier Machine With  
Compensatory Permanent Magnet Array**  
*Xin Wang, Shuye Ding, Haitao Wang, Heng  
Zhu, Tengchao Qu, Guangzhi Li*

14:50-15:10 **TS30-8-5**  
**Loss Minimization Based Energy  
Management for A Dual-Motor Electric  
Vehicle**  
*Chao Xu, Xiaorui Guo, Qian Xun*

15:10-15:45 **Tea Break** Juanhu Hall

15:45-17:45 **IS-30-3 EV Motor Design**  
QIUSHI HALL  
*Chair: Taiying Zheng, Zhejiang University  
Xiaoyan Huang, Zhejiang University*

**IS30-3-1**  
**From system to the system, A cloud based multi physics motor design solution**  
15:45-16:15  
*Weizhong Fang, Hangzhou Easitech Technology Co., Ltd.*

**IS30-3-2**  
**A Survey of Nd-Fe-B permanent magnet material industry**  
16:15-16:45  
*Bo XIN, Baotou research Institute of Rare Earths*

**IS30-3-3**  
**The application of advanced manufacturing in the traction motor for electric vehicles**  
16:45-17:15  
*Chengwei Gan, Wolong Electric Global Research Centre*

**TS-30-9 Thermal Analysis of Electrical Devices** ZIWEI HALL  
15:45-17:25  
*Chair: Helong Li, Hefei University of Technology  
Guangdi Li, Northeastern University*

**TS30-9-1**  
**Online Junction Temperature Measurement Of SiC MOSFET In Practical Converters**  
15:45-16:05  
*Minmin He, Hengyu Yu, Yuzhou Ding, Bo Hu, Zipeng Ke, Jun Wang*

16:05-16:25 **TS30-9-2**  
**Transient thermal management of SiC power modules by an in-built thermal buffer layer**  
*Weiyu Tang, Junye Li, Junliang Lu, Zan Wu, Kuang Sheng*

16:25-16:45 **TS30-9-3**  
**Online Junction Temperature Monitoring for Discrete SiC MOSFET Based on On-state Voltage at High Temperature**  
*Haoran Hu, Zhiqiang Wang, Yimin Zhou, Da Zhou, Guoqing Xin, Xiaojie Shi*

16:45-17:05 **TS30-9-4**  
**Impact of Vibrations Exposure Cycles on Wire Insulation Lifetime During Thermal Qualification**  
*Yatai Ji, Paolo Giangrande, Weiduo Zhao, Vincenzo Madonna, He Zhang, Michael Galea*

17:05-17:25 **TS30-9-5**  
**Thermal Design of Air-Cooled YASA AFPM Motor with Heat Pipes**  
*Yuqing Zhang, Weiwei Geng, Qiang Li*

15:45-17:25 **TS-30-10 Fault Tolerance and Diagnosis of Electric Devices** GUIYU HALL  
*Chair: Zhixun Ma, Tongji University*  
*Bo Yang, Xi'an University of Technology*

- TS30-10-1**  
**The Fault-Tolerant Control Strategy of DC-side for Three-phase to Single-phase Cascaded Converter**  
*Zhouran Wang, Li Zeng, Xiaoqiong He*
- TS30-10-2**  
**A Novel Diagnosis Method for IGBT Open-Circuit of Modular Railway Power Conditioner**  
*Hongqi Ding, Fujun Ma, Rong Han, Mingxiang Xi, Cheng Zhang, Xing Xiong*
- TS30-10-3**  
**Motor Bearing Fault Diagnosis based on Hilbert-Huang transform and Convolutional Neural Networks**  
*Danfeng Du, Jian Zhang, Youtong Fang, Jie Tian*
- TS30-10-4**  
**A Study on Multi-Fault Diagnosis Methods for a Series-Parallel Battery Pack**  
*Jianming Li, Yuwei Nie, Can Wang, Quanqing Yu*
- TS30-10-5**  
**Inter-Turn Short Circuit Fault Diagnosis for PMSM Predictive Control System Based on Duration-Space-Vector Technique**  
*Lisong He, Jinsong Kang, Dongliang Ke, Fengxiang Wang*

## **TS-30-11 Permanent Magnet Machines I**

Zhuyun Hall

15:45-17:25

*Chair: He Zhang, University of Nottingham*

*Ningbo China*

*Chenwei Ma, Southwest Jiaotong University*

### **TS30-11-1**

#### **Investigation of Dual Three-Phase 48-Slot/8-Pole Permanent Magnet Machines with Different Winding Arrangements**

15:45-16:05

*Haoyu Chen, Hao Hua, Wei Hua*

### **TS30-11-2**

#### **Reduction of Magnet Usage in Flux-Reversal Permanent Magnet Machine for Electric Vehicle**

16:05-16:25

*Xiaofeng Zhu, Guishu Zhao, Shuye Ding, Wei Hua*

### **TS30-11-3**

#### **Study of the MMF and rotor losses in the PMSM with the same number of poles and slots**

16:25-16:45

*Jiutong Yang, Jinhua Chen, Guilin Yang, Chi*

*Zhang, Jijun Qiao, Chin-Yin Chen*

### **TS30-11-4**

#### **Comparison of Dual 3-phase Modular Permanent Magnet Machines with Overlapping/Non-overlapping Windings and Redundancy**

16:45-17:05

*Yanxin Li, Z. Q. Zhu, A. Thomas, Qinfen Lu*



17:05-17:25  
**TS30-11-5**  
**Electromagnetic Performance Comparison of Stator Partitioned Doubly Salient Permanent Magnet Machines with Different Number of Permanent Magnets**  
*Guangqiang Ming, Jianping Yuan, Shihao Ma, Junjie Yang, Linjun Si, Weifeng Shen*

15:45-17:25  
**TS-30-12 Thermal Analysis of Electric Machines** Bihe Hall  
*Chair: Zan Wu, Zhejiang University*  
*Nan Zhao, Nanjing Institute of Technology*

15:45-16:05  
**TS30-12-1**  
**Research on the Effect of Heat Pipe Inclination Angle on Temperature Distribution in Electrical Machines**  
*Han Zhao, Xiaochen Zhang, Xiaorui Zhu, Yue Zhang, Hongyu Yan, Zhihao Niu*

16:05-16:25  
**TS30-12-2**  
**CFD-based temperature field analysis and lifetime prediction of brushless DC motor**  
*Jiajin Wang, Lin Xu, Lingfeng Cai, Jian Zhang, Jie Tian*

16:25-16:45  
**TS30-12-3**  
**Research on Heat Dissipation Characteristics of PM in-wheel Motor Using Electrical-Thermal Bi-Directional Coupling Method**  
*Pai Fan, Xiaoyong Zhu, Xue Zhou, Deyang Fan, Zixuan Xiang*

#### **TS30-12-4**

16:45-17:05

**Thermal analysis of deep-sea oil-filled motor using lumped-parameter thermal model and CFD**

*Kangwen Wu, Lingfeng Cai, Jian Zhang, Youtong Fang, Yongmao Wang*

#### **TS30-12-5**

17:05-17:25

**Eddy current loss reduction technique for solid rotor high-speed surface mounted motor**

*Yuchun Lin, Xiaoze Pei, Boyuan Yin, Zhongze Wu, Chris Brace*

18:30-20:00

**Banquet Mingdu Hall  
(Kaiyuan Mingdu Hotel 3F)**

## Day4: Oct. 31st

Time	Content
08:00-09:40	<b>TS-31-1 Modulation for Converters  </b> Qiushi Hall <i>Chair: Lin Qiu, Zhejiang University</i> <i>Jian Zhang, Zhejiang University</i>
08:00-08:20	<b>TS31-1-1</b> <b>Efficiency Analysis of Optimal PWM Method for Boost Inverter Applied to Electric/Hybrid Vehicles</b> <i>Hang Li, Deliang Wu</i>
08:20-08:40	<b>TS31-1-2</b> <b>Voltage Slew Rate Design With Soft Switching Technique</b> <i>Jialong Li, Yuying Wu, Dehong Xu;</i>
08:40-09:00	<b>TS31-1-3</b> <b>Modulation and Voltage Balance Control of a Four-Level ANPC H-Bridge Converter for Ship Medium-Voltage Propulsion Systems</b> <i>Wei Zhou, Huasong Fang, Nianzhou Liu, Kui Wang, Zedong Zheng, Yongdong Li</i>
09:00-09:20	<b>TS31-1-4</b> <b>Power Loss Equalization Method of Single-phase Three-level ANPC Rectifiers Based on Periodic Rotational Modulation</b> <i>Sihui Zhang, Wenjun He, Wensheng Song</i>

## **TS-31-2 Charging Technologies II**

Ziwei Hall

08:00-09:40

*Chair: Ruisheng Diao, Zhejiang University  
Wenxing Zhong, Zhejiang University*

### **TS31-2-1**

#### **A Constant Output Voltage Control Strategy of Inductively Coupled Power Transfer System for Rail Transit System**

08:00-08:20

*Jixin Yang, Liming Shi, Zhenggang Yin, Wenjing Tang*

### **TS31-2-2**

#### **A Novel High-Misalignment Tolerant Magnetic Coupler for IPT System with Concentrated Magnetic Flux and Counteracting Coil**

08:20-08:40

*Kang Wu, Yijie Wang, Xiufang Liu, Jianwei Mai, Dianguo Xu*

### **TS31-2-3**

#### **A Comprehensive Comparison Study of Planar Circular and Square Couplers for IPT Applications**

08:40-09:00

*Jing Xiao, Wenlan Gong, Shaonan Chen, Xiaorui Wu, Xiufang Liu, Yousu Yao*

### **TS31-2-4**

#### **A Bidirectional WPT System Using Double-sided LCC Compensation Topology and Full-bridge Active Rectifier**

09:00-09:20

*Xiaoqian Liu, Yijie Wang, Hongjun Chen, Jianwei Mai, Dianguo Xu*

### **TS31-2-5**

#### **Prediction-Based EV-PV Coordination Strategy for Charging Stations Using Reinforcement Learning**

09:20-09:40

*Fangyuan Sun, Shu Su, Ruisheng Diao, Han Cheng, Da Meng, Shuai Lu*

### **TS-31-3 Permanent Magnet Machines II**

Guiyu Hall

08:00-09:40

*Chair: Wenxi Yao, Zhejiang University  
Chushan Li, Zhejiang University*

### **TS31-3-1**

#### **PM Synchronous Motor**

#### **Characterization with an Integrated Common-Mode Voltage Filter**

08:00-08:20

*Jing Zhang, Xiaochen Zhang, Chunyang Gu, Jing Li, He Zhang, Han Zhao, Suoliang Zhang*

### **TS31-3-2**

#### **Backstepping Sliding Mode Control of Permanent Magnet Linear Synchronous Motor Based on Immersion and Invariance Theory**

08:20-08:40

*Xin Fang, Limei Wang, Kang Zhang*

**TS31-3-3**  
**An Improved Rotor Position Estimation  
Method for PMSM Using  
Low-Resolution Hall-Effect Sensors**  
*Xiaofeng Xu, Xiaoyan Huang, Zhaokai Li*

**TS31-3-4**  
**Analysis of an Axial-Module  
Flux-Switching Permanent Magnet  
Machine based on field modulation  
theory**  
*Yiwei Wang, Peng Su, Yi Shen*

**TS-31-4 Electric Machine System  
Modeling I** Zhuyun Hall  
*Chair: Jien Ma, Zhejiang University*  
*Hao Ma, Zhejiang University*

**TS31-4-1**  
**An improved Kriging surrogate model  
method with high robustness for  
electrical machine optimization**  
*Junli Zhang, Wei Hua, Yuan Gao, Yuchen Wang,  
Hengliang Zhang*

**TS31-4-2**  
**A Quasi-Three-Dimensional Magnetic  
Equivalent Circuit Model of Yokeless  
and Segmented Armature Axial Flux  
Motors Considering Radial  
Segmentation Magnetic Coupling**  
*Xining Sun, Limei Wang, Xinggang Fan, Dawei Li,  
Ronghai Qu, Jianying Chen*

### **TS31-4-3**

08:40-09:00

#### **Torque Improvement of Dual Three-phase YASA Machine Based on Current Harmonics Injection**

*Xueyi Yan, Lingyun Shao, Zhuoran Zhang, Zhongze Wu, Wei Hua, Ming Cheng*

09:40-10:00

**Tea Break**

Juanhu Hall

10:00-11:40

#### **TS-31-5 Parameter and State Identification of Electric Machines and Devices**

Qiushi Hall

*Chair: Jien Ma, Zhejiang University  
Chushan Li, Zhejiang University*

10:00-10:20

### **TS31.5.1**

#### **Decoupled Offline Parameter Identification of Induction Motors**

*Yu Li, Bo Wang, Yong Yu, Dianguo Xu*

10:20-10:40

### **TS31.5.2**

#### **An Online Monitoring Method for IGBT Modules in Single-Phase Three-Level Neutral Point Clamped Inverters**

*Zhaoxiang Chen, Mingyao Ma, Ning Wang*

10:40-11:00

### **TS31.5.3**

#### **Calculation of Inductance Parameters of Variable Reluctance Resolver Based on Improved Winding Function Method**

*Yaqian Cai, Wenyin Zhu, Yichen Liu, Ronggang Ni*

#### **TS31.5.4**

11:00-11:20 **Online Monitoring Method of Junction Temperature for IGBT Devices by the Redefining Turn-off Delay Time**

*Tao Tang, Kexin Yang, Wensheng Song*

10:00-11:40 **TS-31-6 Control of Permanent Magnet Synchronous Motors II**      Ziwei Hall

*Chair: Wenxi Yao, Zhejiang University*

*Wenxing Zhong, Zhejiang University*

#### **TS31.6.1**

10:00-10:20 **Improved Sliding-Mode Speed Control of Permanent Magnet Synchronous Motor Based on Working Condition Identification**

*Zhixin Wang, Rongkun Wang, Wugen Liu, Yujia Zhuang, Wenjie Huang, Quankai Du*

#### **TS31.6.2**

10:20-10:40 **Multi-objective control harmonic current solution for permanent magnet synchronous motor**

*Wang Xinjian, Wang Hui, Ying Liu, Yuanyuan Li, Pengyuan Wang*

#### **TS31.6.3**

10:40-11:00 **Integral-type position and Speed Estimator for Sensorless control of PMSM**

*Jin Wang, Lujian Fan, Guangqi Li, Zhiyong Dai*



**TS31.6.4**  
**Novel Deadbeat Predictive Flux Linkage Control Method for Permanent Magnet Synchronous Motor Drives with Disturbance Suppression Scheme**  
11:00-11:20  
*Xin Sun, Xi Xiao, Meng Zhang, Weihua Wang*

**TS-31-7 Electric Machine System Modeling II** Guiyu Hall  
10:00-11:40  
*Chair: Xing Liu, ZJU-Hangzhou Global Scientific and Technological Innovation Center*  
*Hao Ma, Zhejiang University*

**TS31.7.1**  
**Magnetic Field Analysis of Modular Induction Spherical Motor**  
10:00-10:20  
*Bin Li, Yasai Hao, Shengwei Qiao*

**TS31.7.2**  
**A Semi-Analytical Method for Obtaining the Flux-Linkage Characteristics of Mutually-Coupled Switched Reluctance Machine**  
10:20-10:40  
*Xiaoqiang Guo, Tu Lv, Rui Zhong, Wei Hua, Xiaogang Wen*

**TS31.7.3**  
**Analysis of Electric Excitation Flux Switching Motor Based on High Temperature Resistant Inorganic Insulated Wire**  
10:40-11:00  
*Dongshan fu, Lianke Wang, Hongyu Si, Xiaojie Wu, Li Lei, Yingsan Geng*

**TS31.7.4**  
**Current Threshold Scheme for Torque  
Ripple Reduction of a 4/2 Switched  
Reluctance Motor**  
*Alvaro Hadipranoto, Grace Lukman, Jin-Woo Ahn*

**TS31.7.5**  
**A Novel Airgap Permeance Modeling  
Approach for Electrical Machines  
Based on Electrostatic FEA**  
*Mengmeng Cui, Tianjie Zou, Dawei Li, David  
Gerada, Ronghai Qu, Chris Gerada*

**TS-31-8 Nexus Energy Systems**  
Zhuyun Hall  
10:00-11:40  
*Chair: Ruisheng Diao, Zhejiang University  
Xiaoliang Jin, Nanjing Institute of Technology*

**TS31.8.1**  
**Optimal Voltage Recovery Control  
Scheme of Wind Farm Based on  
Topology Reconfiguration**  
10:00-10:20  
*Shuaifeng Wang, Juan Wei, Sheng Huang, Hanzhi  
Peng, Guohang Huang, Lai Wei*

**TS31.8.2**  
**Review on Fault Characterization and  
Diagnosis Technique in Photovoltaic  
Systems**  
10:20-10:40  
*Qiunan Xu, Xingshuo Li, Chunmei Feng, Ruichi Wang*

**TS31.8.3**

**DC- Link Voltage Equalization and  
Second Ripple Suppression Control  
Strategy for Three-Phase To  
Single-Phase Converters**

10:40-11:00

*Zhiyong Qu, Jingying Lin, Xiaoqiong He*

## Dialogue Session 1: Oct. 29<sup>th</sup> 13:30-15:15

Session chairs: Lijun Hang, Hangzhou Dianzi University  
Xiaoyan Huang, Zhejiang University

- 1 Adaptive Nonlinear Speed Tracking Control of Permanent Magnet Linear Synchronous Motor**  
*Kang Zhang, Limei Wang, Xin Fang*
- 2 A Novel Force Control Method for Dead Centers Tracking of Free-Piston Linear Generator**  
*Chuang Chen, Chengde Tong, Bo Liu, Ping Zheng, Jing Shang*
- 3 Hybrid Four-segment-mode Model Predictive Control for Open-winding PMSM Drives with Zero Sequence Current Suppression and Fixed Switching Frequency**  
*Xiaoguang Zhang, Han Zhang, Kang Yan*
- 4 Study on the Effect of Composite Sleeve on Rotor Loss of High-Speed PM BLDC**  
*Chao Luo, Jien MA, Bowen XU, LIN Qiu, Xing LIU, Youtong FANG*
- 5 Analysis of High Step-up Switched Capacitor DC-DC Converter Based on Coupled Inductors**  
*Zheng Bai, Jingwei Shao, Jingyun Gu, Xiangjun Zhang, Hao Liu, Dianguo Xu*
- 6 An Online Fault-Tolerant Optimization Strategy of Copper Loss for Dual Three-Phase PMSM drives**  
*Kailiang Yu, Zheng Wang*
- 7 Analysis of High-temperature Parasitic False Turn-on in a SiC MOSFET Half-bridge Circuit**  
*Zhikun Wang, Saijun Mao, Hongping Ma, Shuhao Yang, Xi Lu, Hongyao Liu*

- 8 **Study on Parameter Sensitivity in High Power Sensorless Induction Machine Drive**  
*Hongwu Chen, Jian Li*
- 9 **Digital Twin Approach for IGBT Parameters Identification of a Three-Phase DC-AC Inverter**  
*Hang Shi, Lan Xiao, Qunfang Wu, Wanquan Wang*
- 10 **Novel Dead-Time Compensation Strategy for Voltage Integrity Based on Complete Switching State Analysis**  
*Hongtao Fang, Hengdong Cui, Ronggang Ni*
- 11 **A hybrid PWM method for three-phase voltage source converter based on equivalent model**  
*Yifan Zhang, Chujia Guo, Jingjing Huang*
- 12 **Experimental Investigation for Switching Characteristics of SiC Based Voltage-Reverse-Blocking Devices in CSI**  
*Yinzhen Shen, Zheng Wang, Yang Xu*
- 13 **A Novel Circulating Current Suppression Strategy of Parallel Three-level Inverters in Flywheel Energy Storage System with Zero-sequence Voltage Injection**  
*Zhongrui Li, Ziling Nie, Sheng Ai, Jie Xu, Meihe Cao*
- 14 **Simplified Carrier-Based Space Vector Modulation Scheme for the Modular Multilevel Converter**  
*Weiliang Wang, Qian Xiao, Huiqiao Liu, Yu Jin, Yunfei Mu, Hongjie Jia*
- 15 **A Torque Ripple Minimization Voltage Harmonic Calculation Strategy Considering Harmonic Injection Accuracy**  
*Yongchao Yin, Peng Yi, Wenzhi Zheng, Dongliang Zhang*

- 16 **A Zero-sequence Current Suppression strategy for Five-phase Open-end Winding PMSM with Vector Proportional Integral Controller**  
*Chunyang Jiang, Hongchen Liu, Xinsheng Zhang, Youzheng Wang, Chaochao Li*
- 17 **Fault Diagnosis and Location Approach of Modular Multilevel Converter Based on Dual One-Dimensional Convolutional Neural Network**  
*Zhihong Bai, Yongchun Guo, Shouzan Jiang, Liang Kong*
- 18 **Ultra-Local Model-Free Predictive Current Control for PMLSM drive systems with Moving Horizon Estimator**  
*Haichuan Niu, Zhixun Ma, Jian Huang, Guobin Lin*
- 19 **Noise Optimization of High-Speed Permanent Magnet Motor by Stiffeners**  
*Jiabo Shou, Jien Ma, Bowen Xu, Lin Qiu, Chao Luo, Youtong Fang*
- 20 **Control strategy for self-bearing dual stator solid rotor axial flux induction motor**  
*Cencen Hong, Quan Sun, Yongjin Li, Yijun Du*
- 21 **Torque and Loss Analysis of Permanent Magnet Vernier In-Wheel Motors with Rotor Flux Barriers**  
*Feng Chai, Xi Zhang, Yanlei Yu, Lei Chen*
- 22 **Position Sensorless Control and Real-time Commutation Delay Compensation of a Micro BLDC Motor**  
*Xiaofeng Ding, Zishi Liu*

- 23 **Research on Winding Coefficient and Cogging Torque of Few-pole Fractional Slot Permanent Magnet Synchronous Motor**  
*Pan Liu, Yinru Bai, Xuping Wang, Shuqing Tan*
- 24 **Design of Self-Driven Evaporative Cooling System for Traction Converter**  
*Bin Xiong, Kangjie Huang, Yan Wang, Caixia Zhang, Rui Ma, Pengcheng Su*
- 25 **Energy Management Strategy for Hybrid-Electric Propulsion UAVs**  
*Hongwei Zhao, Xue Jiang, Linke He, Yu Wu, Fengming Ai, Xingzhuang Liang, Weilin Li*
- 26 **General Analytical Model for Electromagnetic Performance Prediction of Interior Permanent Magnet Synchronous Motors**  
*Shiqi Li, Wenming Tong, Shengnan Wu, Renyuan Tang*
- 27 **Steady-State Modeling for LCC Resonant Converter with Phase Shift Modulation Based on Simplified State Trajectory**  
*Shuhao Yang, Hao Wu, Saijun Mao, Dan Wang, Kun Wang, Hongyao Liu*
- 28 **Research on Collaborative Optimization of Distributed Generation and Electric Vehicle Considering Time-Of-Use Price**  
*Zihao Zhao, Shaoxuan Zhang, Jing Zhang, Weichen Wang*
- 29 **Simultaneous Wireless Power and Data Transfer System With Full-Duplex Mode Based on Dual-Resonance and Resistance-Based Duplexer**  
*Jing Feng, Guo Wei, Jiantao Zhang, Jian Cui, Yiming Zhang, Chunbo Zhu*

30 **Stability Analysis of Wireless Power Transfer System Based on Extended Describing Function**

*Shuangqing Lyu, Wenjie Chen, Xiufang Hu*

31 **Auxiliary Motor Drive Based on Three-phase Onboard Battery Charger**

*Boyang Li, Jialou Gao, Yuanhao Xie, Min Zhou, Dong Jiang*



## Dialogue Session 2: Oct. 30<sup>th</sup>, 10:15-12:00

*session chairs: Zheng Wang, Southeast University  
Tianfu Sun, Chinese Academy of Sciences*

- 33 **A Novel Measurement and Compensation Method of Inverter Nonlinearity for Linear Induction Motor**  
*Mingyuan Zhang, Liming Shi, Manyi Fan, Jinhai Liu, Shijiong Zhou, Keyu Guo*
- 34 **Thermal Analysis of Integrated Power Supply in Parallel with Si IGBT and SiC MOSFET Inverter Based on PLECS**  
*Sheng Che, Cheng Peng, Zishun Peng, Yuxing Dai, Wen Hu*
- 35 **Simulation of Permanent Magnet Motor commutation compensation system based on SMO**  
*Zuqi Zou, Quan Jiang*
- 36 **Analytical Model of the Parallel-Connected Silicon Carbide MOSFET Turn-ON Switching Behavior Under Asynchronous Gate Signals**  
*Chen Wang, Shuang Zhao, Jianing Wang, Helong Li, Yuqi Wei, Homer Alan Mantooth*
- 37 **Research on Stator Iron Loss of Ultra-high-speed Permanent Magnet Motor for Hydrogen Fuel Cell Air Compressor**  
*Hongjie Zhang, Wenfei Yu, Wei Hua*

- 38 **A Three-Phase-Module-Parallel Si & SiC Hybrid Inverter with Smaller Filter Size and Low Cost**  
*Lianjie Wang, Wenjin Sun, He Xu, Jiazhan Dong, Chushan Li, Wuhua Li*
- 39 **Weak Grid State Identification Based On Current Spectrum**  
*Xing Zhang, YuHang Wu, Siyu Chen, Huaqiao Zhu, Xiangdui Zhan, Xinxin Fu*
- 40 **A Current Optimization Strategy for a Hybrid DC Transformer with MMC Structure and Series-connected Switches**  
*Xuhao Zhu, Rongguan Li, Wu Chen, Lingling Cao, Renjie Hu*
- 41 **Position Sensorless Startup Scheme for PMSM Drives with Single Current Sensor**  
*Chen Wang, Wentao Zhang, Guodong Yu, Wenjie Wang, Yongxiang Xu*
- 42 **Deadbeat Robust Current Predictive Control for Induction Motor with Nonlinear Integral Sliding Mode Observer**  
*Yezhe Sheng, Jinsong Kang*
- 43 **Single-Sensor Based Low-Cost Current Control in SRM Drives for Electric Vehicle Applications**  
*Nasir Ali, Qingsong Wang, Qiang Gao, Ke Ma*

- 44 **An Active Damping Method with Differential Feedback of Filter Capacitance Voltage for LCL Filter Based Grid-connected Inverters**  
*Tie Li , Dai Cui, Mingming Li, ZengBao Zhuang, Huafeng Xiao*
- 45 **A Hybrid Modular Multilevel Converter Comprising Si Submodules and SiC Submodules with Its Specialized Capacitor Voltage Balancing Strategy**  
*Yiming Sun, Linjie Han, Binbin Li, Zigao Xu, Shaoze Zhou, Dianguo Xu*
- 46 **An Improved Control Strategy of PM-Assisted Synchronous Reluctance Machines Based on an Extended State Observer**  
*Dongyang Li, Chunyang Gu, Shuo Wang, He Zhang, Chris Gerada, Robert Camilleri, Yue Zhang*
- 47 **Research on Control Strategy of Voltage Source Active Damper Based on Droop Control**  
*Fei Li, Yang Liu, Ruijie Cheng, Yongxin Zhang, Xing Zhang, Qiang Chen*
- 48 **Deep Q-Network based Adaptive Robustness Parameters for Virtual Synchronous Generator**  
*Wenjie Wu, Feng Guo, Qiulong Ni, Xing Liu, Lin Qiu, Youtong Fang*
- 49 **Factors Influencing the Accuracy of Switching Characterization for SiC MOSFET**  
*Zhikun Wang, Saijun Mao, Hongping Ma, Shuhao Yang, Xi Lu, Hongyao Liu*

- 50 **Reactive Power Optimization Strategy of Wind Farm Based on Particle Swarm Optimization Algorithm**  
*Feng Jiang, Tie Li, Dai Cui, Cunliang Zhang, Huafeng Xiao*
- 51 **Torque Prediction of Magnetic Gear considering 3D Axial Leakage Flux by Equivalent Magnetic Circuit**  
*Seung-Hun Lee, So-Yeon Im, Jun-Yeol Ryu, Myung-Seop Lim*
- 52 **A Review of In-Wheel Motors for Electric Vehicle Propulsion**  
*Essossinam Aloeyi, Nasir Ali, Qingsong Wang*
- 53 **Online Efficiency Prediction of Induction Motor using Model Reference Adaptive Method**  
*Guisheng Wang, Wei Li, Qingbo Sheng, Lu Fan, Xiaohan Zhang*
- 54 **An Improved High-Frequency Signal Injection Sensorless Control Based on Luenberger Observer for Permanent Magnet Synchronous Motor Drives**  
*Bo Xia, Sheng Huang, Ji Zhang, Wenjuan Zhang, Wu Liao, Jian Gao*
- 55 **The Control Strategy of the Multi-phase Permanent Magnet Synchronous Machine under the Unbalanced Grid**  
*Zhiqi Yan, Shoudao Huang, Wu Liao, Kai Xiao, Lv Mingcheng*

- 56 **Comparison and evaluation of the thermal performance between SiC-MOSFET and Si-IGBT**  
*Cheng Tang, Qianming Xu, Rong Han, Peng Guo, Rui Liu, Zhuo Qing*
- 57 **An Open-Circuit Fault Diagnosis And Location Method For Dual Active Bridge DC/DC Converter**  
*Jijun Wu, Mingyao Ma, Jiacheng Liang*
- 58 **Hierarchical Control Strategy for Hybrid Heavy-duty Trucks Considering Equivalent Hydrogen Consumption and Fuel Cell Life**  
*Ziyang Zhang, Fei Wang, Hui Guo, Tianling Shi, Lei Hu*
- 59 **Analysis of Energy Storage Participation Policies in an Electricity Market Environment**  
*Yizheng Wang, Jiahua Hu, Xin Fang, Junjie Li, Hongliang Wang, Zhou Lan*
- 60 **The Small-Signal Stability Analysis of the Interacted Co-Phase Traction Power Supply System in Electric Railway**  
*Jing Li, Xiaoqian Li, Yingdong Wei, Xu Guo, Chao Lu, Yunzhi Lin*
- 61 **Field Weakening Strategies to Suppress Intermediate dc-dc Conversion Stages in Hybrid Construction Machinery**  
*Thiago M. Parreiras, Dener A. L. Brandao, Thales A. C. Maia, Igor A. Pires, Anderson Nascimento, Braz J. Cardoso*

**62 Three-Coil-Based Single-Stage Inductive Power Transfer Converter with Voltage-Sigma Architecture for Battery Charging Applications**

*Xiaoqiang Wang, Jie Tian, Xin Zhang, Hao Ma, Pan Geng, Rui Li*

**63 Exploring the Development of Railway Equipment Technology from the Perspective of Standardization**

*Feng CUI, Qihua WANG, Gui LIU, Qiang WU*