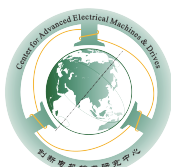
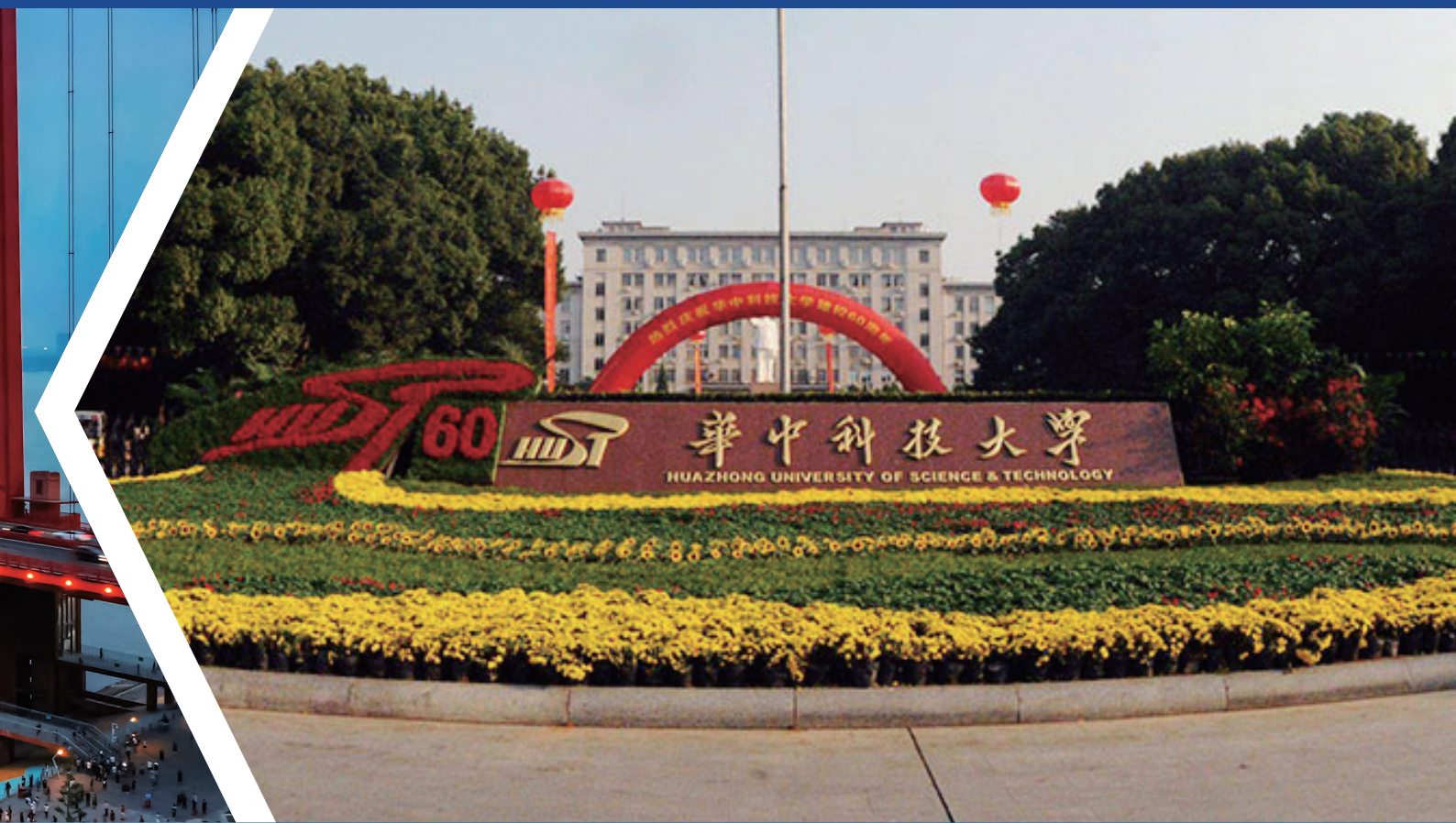


CYCEE 2020

China International Youth Conference on Electrical Engineering

Nov. 2-4, 2020 Wuhan, China

PROGRAM



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About CIYCEE

Conference Concept

China International Youth Conference on Electrical Engineering is an integrated platform for the young students and professionals all over the world to investigate the future electrical engineering technologies. It emphasizes both the traditional and novel sub-fields under electrical engineering, including power energy, power electronics, electrical machine and drive, electromagnetism and so on. Following the spirit of IEEE IAS, linking research to practice, leading industry and academic experts in these fields will be invited to present latest technical achievements and share practical experience to the participants.

Conference Sponsors

CIYCEE is an international IEEE conference approved and technically sponsored by the IEEE Industry Applications Society (IAS). In this year of 2020, the first conference is organized by the IEEE IAS Student Chapter of Huazhong University of Science and Technology (HUST), and co-organized by IEEE IAS Student Chapter of Xinan Jiaotong University (XJU) and IEEE PELS (Power Electronics Society) Student Chapter of HUST. Both IEEE IAS Wuhan Chapter and School of Electrical and Electronics Engineering of HUST will technically and financially sponsor this conference.

Participants and Technique aspects

CIYCEE will be an international youth conference and assemble students pursuing electrical engineering-related degrees and experts from industry and academia to engage in a forum for technical presentations and professional development. As a technical paper conference, all participant shall have an accepted paper.

All aspects of electrical engineering are welcome to be presented at CIYCEE. Major topics include, but are not limited to:

- Power Systems
- Power Electronics
- Machines, Electromechanics, and Drives
- Electromagnetism Theories and Technologies
- High Voltage and Insulation Technology

- Electrical Technique and Application

Conference Agenda

1st CIYCEE will be held on Nov.2nd~4th in HUST, Wuhan, China. This Conference will host multiple oral presentation and poster presentation sessions. All accepted papers will be presented in oral or poster sessions. Paper digest and poster abstract submissions are peer-reviewed. Conference content will be submitted for inclusion into IEEE Xplore as well as other Abstracting and Indexing (A&I) databases.

A greeting letter from general chair

It is my pleasure to welcome all of you for the first IEEE China International Youth Conference on Electrical Engineering, CIYCEE 2020, to be held in Wuhan, China, from November 2nd ~ 4th, 2020. CIYCEE 2020 is sponsored by the IEEE Industry Applications Society (IAS) and organized by Huazhong University of Science and Technology (HUST) IEEE IAS Student Branch Chapter .

IEEE CIYCEE aims to provide an integrated platform for the young researchers and professionals all over the world to present their latest research and developing achievements, and to exchange useful information and experiences in the electrical engineering technologies. This conference emphasizes both the traditional and novel sub-fields belonging to electrical engineering, including but not limited to power energy, power electronics, electrical machine and drive, electromagnetism, as well as other relevant areas. Linking research to practice, we will invite the leading industry and academic experts engaging in electrical engineering to present the latest technical achievements and share practical experiences.

As a technical paper conference, all the CIYCEE participants should have an accepted peer-reviewed technical paper. Your works will be presented in either oral or poster form. Conference content will be submitted for inclusion into IEEE Xplore as well as other Abstracting and Indexing (A&I) databases. The outstanding papers will also be recommended to the IEEE IAS technical committee for the consideration of submitting to IEEE Transactions on Industrial Applications (IEEE TIA). Meanwhile, CIYCEE includes tutorials, tour visits, as well as professional development talks and the exposition. We are willing to offer the young researchers a comprehensive opportunity to learn and share the latest ideas, extend your academic friend circle, and gain a further professional development chance.

The conference will last for three days, and all the meetings will be held in the electric building of School of Electrical and Electronic Engineering (SEEE), in HUST. HUST is one of the top universities in China, famous for its engineering, medicine, and basic science, also known as a “forest university”. The tour of first-class laboratories, sights in the beautiful campus, and various dishes from over 30 canteen are bound to give all the participants an unforgettable experience during CIYCEE 2020.

Last but not least, Wuhan, the hosting city of CIYCEE 2020, is an historical, modern and international

city located in the Middle China. As we know, this city has suffered the great pain and destruction from the catastrophic Novel Coronavirus Pneumonia in earlier 2020. However, with the support from the whole country and the world, Wuhan and its citizens are revitalizing and celebrating the resurgence of this great city. Now, we are looking forward to excellent meetings and expositions with talented young researchers, engineers, scientists, and exhibitors from different countries around the world, sharing new and exciting innovations in electrical engineering technologies.

See you at CIYCEE 2020, in Wuhan, China from November 1st~4th.

With my best regards,

You Zhou, Ph. D Candidate

General Chair IEEE CIYCEE 2020

Organizing committee

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Rui Li, Huazhong University of Science and Technology, China

Jingyi Liu, Huazhong University of Science and Technology, China

Program

Schedule-at-a glance

Mon 02/11	09:00-12:00	Opening ceremony+Keynotes
	14:30-15:45	Technical paper session1-session5
	16:00-17:15	Technical paper session6-session10
Tue 03/11	09:00-10:15	Technical paper session11-session15
	10:30-11:45	Technical paper session16-session20
	14:30-16:00	Young experts session1
	16:30-17:00	Young experts session2
Wed 04/11	09:00-10:15	Technical paper session21-session25
	10:30-11:45	Technical paper session26-session30
	14:30-15:30	Poster session1-5
	15:30-16:30	Poster session6-10
	16:30-17:00	Closing ceremony+Award ceremony

Keynotes

Moderator:

Title	Keynote speaker
High Power Electronics: Control Challenges and Opportunities	Tobias Geyer ABB Medium-Voltage Drives
IEEE Industry Applications Society for Research Enhancement and Career Development	Wei-Jen Lee The University of Texas at Arlington
Applications and Multi-Physics Design of High Speed Permanent Magnet Synchronous Motor	Jian-Xin SHEN Zhejiang University



Keynotes

Mon 02/11 09:00-12:00

Moderator:

High Power Electronics: Control Challenges and Opportunities



Tobias Geyer

ABB Medium-Voltage Drives, Switzerland

Tobias Geyer (M'08 - SM'10) received the Dipl.-Ing. and Ph.D. degrees in electrical engineering from ETH Zurich, Zurich, Switzerland, in 2000 and 2005, respectively, and the Habilitation degree in power electronics from ETH Zurich, Zurich, Switzerland, in 2017. After his Ph.D., he spent three years at GE Global Research, Munich, Germany, three years at the University of Auckland, Auckland, New Zealand, and eight years at ABB's Corporate Research Centre, Baden-Dättwil, Switzerland. There, in 2016, he became a Senior Principal Scientist for power conversion control. He was appointed as an extraordinary Professor at Stellenbosch University, Stellenbosch, South Africa, from 2017 to 2020. In 2020, he joined ABB's medium-voltage drives business as R&D platform manager of the ACS6000/6080.

He is the author of 35 patent families and the book "Model predictive control of high power converters and industrial drives" (Wiley, 2016). He teaches a regular course on model predictive control at ETH Zurich. His research interests include medium-voltage and low-voltage drives, utility-scale power converters, optimized pulse patterns and model predictive control. Dr. Geyer is the recipient of the 2017 First Place Prize Paper Award in the Transactions on Power Electronics, the 2014 Third Place Prize Paper Award in the Transactions on Industry Applications, and of two Prize Paper Awards at conferences. He is a former Associate Editor for the Transactions on Industry Applications (from 2011 until 2014) and the Transactions on Power Electronics (from 2013 until 2019). He was an international program committee vice chair of the IFAC conference on Nonlinear Model Predictive Control in Madison, WI, USA, in 2018. Dr. Geyer is a Distinguished Lecturer of the Power Electronics Society in the years 2020 and 2021.

Abstract

Power converters in the Megawatt range are becoming an integral part of the modern power system. Examples include HVDC transmission systems, renewable energy generation, large variable-speed drives, STATCOMs, rail grid interties and pumped hydro storage systems. These high power converters are operated at very low switching frequencies, require fast control loops and must often adhere to tight limits on their harmonic distortions. The typically used linear control methodology with pulse width modulation often impairs the achievable performance. This talk provides an industrial perspective on high power electronics, summarizes their challenges and proposes novel control techniques to address some of them. Two pilot installations are discussed in detail including a 45 MW variable speed drive compressor system.



IEEE Industry Applications Society for Research Enhancement and Career Development



Wei-Jen Lee, PhD, PE
Professor and Director
Energy Systems Research Center
The University of Texas at Arlington
wlee@uta.edu

Professor Lee received the B.S. and M.S. degrees from National Taiwan University, Taipei, Taiwan., and the Ph.D. degree from the University of Texas, Arlington, in 1978, 1980, and 1985, respectively, all in Electrical Engineering. In 1986, he joined the University of Texas at Arlington, where he is currently a professor of the Electrical Engineering Department and the director of the Energy Systems Research Center. He has been involved in the revision of IEEE Std. 141, 339, 551, 739, 1584, and 3002.8 development. He is the President Elect of the IEEE Industry Application Society (IAS) and an editor of IEEE Transactions on Industry Applications and IAS Magazine. He is a member of IEEE Fellow Committee. He is the project manager of IEEE/NFPA Collaboration on Arc Flash Phenomena Research Project.

Prof. Lee has been involved in research on Utility Deregulation, Renewable Energy, Arc Flash Hazards and Electrical Safety, Smart Grid, MicroGrid, Industrial Internet of Things (IIoT) and Virtual Power Plants (VPP), AI for Load, Price, and Wind Capacity Forecasting, Power Quality, Distribution Automation, Demand Response, Power Systems Analysis, Short Circuit Analysis and Relay Coordination, Distributed Energy Resources, Energy Storage System, PEV Charging Infrastructure Design, AMI and Big Data, On Line Real Time Equipment Diagnostic and Prognostic System, and Microcomputer Based Instrument for Power Systems Monitoring, Measurement, Control, and Protection. He has served as the primary investigator (PI) or Co-PI of over one hundred funded research projects with the total amount exceed US\$17 million dollars. He has published more than one hundred and seventy-five journal papers and two hundred ninety conference proceedings. He has provided on-site training courses for power engineers in Panama, China, Taiwan, Korea, Saudi Arabia, Thailand, and Singapore. He has refereed numerous technical papers for IEEE, IET, and other professional organizations.

Prof. Lee is a Fellow of IEEE and registered Professional Engineer in the State of Texas.

Abstract

The Industry Applications Society (IAS) is the sixth largest society within the IEEE. There are more than 10000 members within the IAS. As a transnational organization, IAS is interested in advancement of the theory and practice of electrical and electronic engineering in the development, design, manufacture and application of electrical systems, apparatus, devices and controls to the processes and equipment of industry and commerce; promotion of safe, reliable and economic installations; industry leadership in energy conservation and environmental, health, and safety issues; creation of voluntary engineering standards and recommended practices; and the professional development of its membership. For sustainable development, IAS has devoted significant amount of resources and efforts for its members, especially to young professional and students. The Chapters and Membership Department (CMD) of IAS has launched many programs to stimulus the participation of young professional and students. This presentation discusses the available resources and opportunities within the IAS to enhance your research and career development.



Applications and Multi-Physics Design of High Speed Permanent Magnet Synchronous Motor



Prof. Jian-Xin SHEN

Zhejiang University, China

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Jian-Xin Shen received the B.Eng. and M.Sc. degrees from Xi'an Jiaotong University, Xi'an, China in 1991 and 1994, respectively, and the Ph.D. degree from Zhejiang University, Hangzhou, China in 1997, all in electrical engineering. He was with Nanyang Technological University, Singapore (1997-1999), the University of Sheffield, Sheffield, U.K. (1999-2002), and IMRA Europe SAS, U.K. Research Centre, Brighton, U.K. (2002-2004). Since 2004, he has been a full professor with Zhejiang University. Prof. Shen has authored more than 270 technical papers, and is the inventor of more than 40 patents. He received 8 paper awards from IEEE and international conferences. He was granted the Nagamori Award with recognition of his contribution to permanent magnet electrical machines and high speed electrical machines. He was the general chair of the ICEMS'2014, IEEE VPPC'2016 and IEEE SCEMS'2018 conferences. His main research interests include topologies, control and applications of permanent magnet machines and drives, and renewable energies. More information about Prof. J. X. Shen can be seen on <https://person.zju.edu.cn/en/jxs>.

Abstract

In this speech, some typical applications of high speed permanent magnet synchronous motors (PMSM) are introduced. Optimal design of high speed large PMSM is then presented, taking a 350kW and 13.5krpm non-salient PMSM as an example.

Firstly, it is critical to determine a proper level of PM-excited flux linkage in the armature windings, so that for a given high speed motor the supply voltage can be fully utilized, the motor armature current can be minimized, and the power factor can be enhanced. Of course all of these are associated with proper control strategies, whilst the motor must have sufficient potential capability to cooperate with the control strategies. In other words, the motor itself and the control method should be systematically designed.

Specific considerations on electromagnetic design will be presented. For example, PM rotor structure need be designed to provide sufficient strength against centrifugal force and meanwhile to generate the required level of PM flux, whilst stator winding structure should be designed with appropriate inductance, since high operation frequency could cause high armature impedance. Clearly, high armature impedance may deteriorate the motor power factor, but may also enhance the field modulation capability by armature currents, hence, compromise is essential. On the other hand, during electromagnetic design some special losses such as extra winding ohmic loss and rotor eddy current loss due to high speed operation should be particularly suppressed, as these losses may cause high temperature rise and may even damage the motor.

Rotor stress due to high speed operation need be considered critically. Examples of reducing local over-stress in the rotor will be given, whilst such techniques often harm the motor electromagnetic performance. Therefore, compromise is required again.

Also, design of rotor dynamics is important, in that rotor resonance must be avoided. Basically it is preferable to make a short rotor with a thick shaft to increase the critical resonant frequency. But this will usually enlarge the rotor diameter and consequently increase the rotor stress.

On the other hand, high speed machines enjoy the merit of high power density, but also suffer from the problem of high loss density. Hence, thermal design is particularly required. Winding impregnation or encapsulation can be employed, whilst liquid cooling or forced air cooling can be rather effective, hence, single- or even double-phase fluid dynamics computation is required, coupling with thermal analysis. Furthermore, some measures to enhance the fluid dynamics such as introducing extra air channels in the stator core will affect the motor electromagnetic performance.

Clearly, various physical fields are deeply coupled in the high speed large power motors, thus, compromises must be made. Multi-physics analysis and design are not only essential, but also usually need be iterated, so as to achieve an overall satisfactory performance.

Technical paper sessions

Session 1 Mon 02/11 14:30-15:45	
Moderator:	
Title	Speakers
Toward the Decentralized Optimal Operation of Integrated Community Energy System	Wei Lin State Grid Fujian Economic Research Institute, Fujian, China
Energy router based minimum loss cost routing strategy in energy internet	Yunfei Du Huazhong University of Science and Technology Zhiwei Zhao Chongqing Electric Power Research Institute of State Grid Chongqing Electric Power Company
A Market Clearing Model with Demand Response Program of Self-Reported Baseline Mechanism	li Yao State Grid Energy Research Institute
Research on Operation Risk Prevention and Control Technology of Intelligent Distribution	Jia Dongli
Corrective Power Network Reconfiguration for Eliminating Transmission Lines Overload	Jing Kuang Zhejiang University Yingling Zhang State Grid Fujian Electric Power Company

Session 2

Mon 02/11 14:30-15:45

Moderator:

Title	Speakers
Electric-thermal energy storage configuration of regional integrated energy system based on wind power prediction	Yizong Guo, Chutong Wang Zhejiang University
Integrated energy system planning taking into account the energy type and photovoltaic uncertainty	Chutong Wang, Yizong Guo Zhejiang University
Rapid Power System Operation Risk Assessment Considering the Correlation of Wind Generation	Jie Bai China Electric Power Research Institute
Research on Optimal Dispatch of Inter-regional Large-scale Wind Power Consumption	Liufei Tao Huazhong University of Science and Technology
A Two-stage Evolutionary Game Approach for Promoting the Usage of Renewable Energy for Electrification of District Heating	Yujuan Fang Tsinghua University

Session 3

Mon 02/11 14:30-15:45

Moderator:

Title	Speakers
A Novel Active Gate Driver with Auxiliary Gate Current Control Circuit for Improving Switching Performance of High-Power SiC MOSFET	Chengfei Geng Harbin Institute of Technology Shenzhen
A CM EMI Suppression Strategy for the Single-inverter based on the Si/SiC Hybrid Switch	Shuaige Zhu Hunan University
A Hybrid Si/GaN 5-Level Flying Capacitor Single-phase Inverter and its Current Ripple Analysis	Kun Qu, Bo Hu Hunan University
Comparative Analysis of CM EMI for Boost Converter Using Si/SiC hybrid switch	Bo Hu Hunan University
Optimized Design of Internal Current Sharing of Press-pack IGBT	Min Huaidong Huazhong University of Science and Technology

Session 4

Mon 02/11 14:30-15:45

Moderator:

Title	Speakers
Aging Evaluation of 10kV overhead Cables Based on Frequency Domain Spectroscopy	Baipeng Song Xi'an Jiaotong University
Study on Corona Discharge Diagnosis Method in Daylight Environment Based on Visible Image Processing	Yang He Huazhong University of Science and Technology
Test Research on Poor Contact Defect Detection of GIS Based on Temperature and Vibration	Dengwei Ding Tsinghua Sichuan Energy Internet Research Institute
Development and Partial Discharge Characteristics of the White Mark on Pressboard Under Step-stress Voltage	Zhiren Xu, Yiheng Wei Chongqing University
Study on Relationship between Cumulative Discharge Energy and Discharge Marks on Pressboard under High Field Strength	Yiheng Wei, Zhiren Xu Chongqing University

Session 5

Mon 02/11 14:30-15:45

Moderator:

Title	Speakers
Research on a Novel Muti-gap HTS Linear Motor for the Using of Ultra High Speed Maglev	Bo Liu University of Chinese Academy of Sciences
Static Field Calculation of an Octupole Scanning Magnet	Wei Chen Huazhong University of Science and Technology
Design and Analysis of an Electron-beam Tuning Prototype for Current Quantization	Bingqian Zeng Huazhong University of Science and Technology
Research on wireless transmission performance of near-drill magnetic field	Jiang Tao, Ma Keqi, Huang Muxing Huazhong University of Science and Technology
Development of a Power Supply Control System and Virtual Simulation Based on Docker	Chong Zhou Huazhong University of Science and Technology

Session 6

Mon 02/11 16:00-17:15

Moderator:

Title	Speakers
Unloading and Frequency Regulating control for Direct-driven Permanent Magnet Wind Turbine by Changing Power Tracking Curves	Wencong Chu North China Electric Power University
Probabilistic Energy Flow Analysis for Integrated Energy Systems Considering Correlated Uncertainties	Cuiqing Wu South China University of Technology
Relationship between Power Flow Transferring and Path Length using Graph Theory	Jiawei Yu Huazhong University of Science and Technology
Research on Strengthening Method of Power Grid Framework Considering Dynamic Reactive Power Compensation	Yiping Zhang North China Electric Power University
Artificial intelligence recognition method of living body electric shock in low voltage distribution networks	Wei Zheng-feng Fuzhou University

Session 7

Mon 02/11 16:00-17:15

Moderator:

Title	Speakers
Research on a Novel AC Side Start-up Strategy for Hybrid Modular Multilevel Converter	Canfeng Chen, guan hengyu Huazhong University of Science and Technology
Bridge arm Fault Location Method for High Voltage Capacitor of DC Filter in HVDC Systems based on Current Characteristics	Dalin Mu Southwest Jiaotong University
Development of a parameter design software for Hybrid HVDC	Zhenhe Ma School of Electrical Engineering Shandong University
Online Multi-cascade DC Converter Impedance Measurement Method Based on Multi-sine Signal Injection	Meng Li Zhejiang University
Application and research of air material transportation laboratory management system	Yijin Xu, Peiwen Sun Huazhong University of Science and Technology

Session 8

Mon 02/11 16:00-17:15

Moderator:

Title	Speakers
A Novel Centralized Equalization Topology for Series-Connected Battery Packs with Integrated Cascade Structure	Xianbin Qi Harbin Institute of Technology
Research on an AC-side Power Decoupling Circuit	Weidong Fu East China Jiaotong University
Suppression of Common Mode Crosstalk between Power Circuit and Signal Circuit in Power Electronic System	chunyu yang Huazhong University of Science and Technology
Unified Voltage Modulation Technique for Single Phase H-Bridge Inverter	Fukuan Liang Chongqing University of Technology
Front-end Signal Synthesis Design of Low-Level Radio Frequency Control System	Sijing He, Lei Wang Huazhong University of Science and Technology

Session 9

Mon 02/11 16:00-17:15

Moderator:

Title	Speakers
Study on shock wave in underwater pulsed discharge based on finite element analysis	He Zhang Huazhong University of Science and Technology
Numerical simulation study on the effect of electrohydraulic discharge shock wave on rock cracking in static pressure environment	Liangli Xiong Huazhong University of Science and Technology
Empirical Model For the Propagation of Shockwaves Produced by Underwater Pulsed Current Discharge	Zhao Yong, He Zhang Huazhong University of Science and Technology
Effect of high-speed train on vibration and fatigue life of transmission lines	Ming Yin Huazhong University of Science and Technology
Research on Temperature Field of All-film Pulsed Capacitors in Application of Repetitive Pulse Discharge	Bingyang Feng Huazhong University of Science and Technology

Session 10

Mon 02/11 16:00-17:15

Moderator:

Title	Speakers
Simulation Analysis of Electromagnetic Interference of High-voltage Pulse Source	ZhangMengyu Huazhong University of Science and Technology
Identification of Jiles-Atherton Model Parameters Using Improved Genetic Algorithm	Liu Qingsong CSG EHV Power Transmission Company
Design of high-speed data acquisition and management system for negative ion source	Wang Sai Huazhong University of Science and Technology
Analysis and Optimization of Permanent Magnet Electrodynamical Suspension System with a Halbach Array	
Analysis of Modified Tri-axial Circular Helmholtz Coil in Wireless Power Transfer System	

Session 11

Tue 03/11 09:00-10:15

Moderator:

Title	Speakers
Comprehensive Benefit Evaluation of Energy Storage System in Urban Load Center	Yuan Liang North China Electric Power University
Modeling and state of charge estimation of Lion Battery using the autoregressive exogenous model	Xue Jiang Northwestern Polytechnical University
Multi-Objective Maintenance Strategy Optimization of Distributed Photovoltaic Plants	Qi Xiaojing Southeast University
Research on Transient Interaction Mechanism of Two PMSG Considering Different Nodes and Network Characteristics	Zichen Mao Huazhong University of Science and Technology
Control strategy for high frequency third defense line of power grid containing electrochemical energy storage	Chengbin Sun NARI Group Corporation (State Grid Electric Power Research Institute)

Session 12

Tue 03/11 09:00-10:15

Moderator:

Title	Speakers
Research on Discharge Process and Temperature Field of PMSM/G for High Speed Flywheel Energy Storage System	Haoyue Tang Beijing Jiaotong University
Vibration characteristics for shifted-angle of multi-module motor with carrier phase-shift method	Qiyuan Wang Huazhong University of Science & Technology
Six - phase Motor fault-tolerant control based on deadbeat predictive current control	Lei Xu, Huang Muxing Huazhong University of Science and Technology
Calculation and Verification of Magnetic Force in a Radial Permanent Magnetic Bearing based on Quasi-Monte Carlo Method	Yuanhao Du Huazhong University of Science and Technology
An Improved Deadbeat Predictive Current Control Strategy for Interior Permanent Magnet Synchronous Motors	Xin Sun Tsinghua University

Session 13

Tue 03/11 09:00-10:15

Moderator:

Title	Speakers
Power Loss Model and Efficiency Analysis of a Boost Full-bridge Isolated Converter based on SiC MOSFETs for PV applications	Degang Dou University of Chinese Academy of Sciences
A model predictive control method based on space vector modulation for MMC	Weifeng Zhang, Qiang Wang China University of Mining and Technology
Analysis of DC Voltage Fluctuation for Series-Connected STATCOM with IGBT Presspack Modules Compensation of Unbalanced Loads	Xi Zhang North China Electric Power University
Active Damping by Digital Control Delay to Stabilize Grid-Tied Inverter with LCL Filter	Bingyuan Yang Huazhong University of Science and Technology
Fast and Accurate Temperature Estimation of Three-level IGBT Converter Based on 3-D Coupled Thermal Model	Qiang Wang China University of Mining and Technology

Session 14

Tue 03/11 09:00-10:15

Moderator:

Title	Speakers
Numerical Simulation of Shock Wave Propagation in Water by Pulsed Arc Discharge	Jin Yang, Zhuoyu Zhang Huazhong University of Science and Technology
Acid and Alkali Resistance of Cycloaliphatic Epoxy Resin Insulators	yunsong wang Tsinghua University
Influence of dust on surface properties of epoxy resin	Pin Lü North China Electric Power University
Simulation of Cable Joint Temperature of Distribution Network Based on Contact Effect and Gap Defects	Luo Simin Guangzhou Power Supply Bureau Co. LTD
The Influence of Gas Pressure and Voltage on Surface Charge Behavior of Basin Type Insulator	Wei Du Shenyang University of Technology

Session 15

Tue 03/11 09:00-10:15

Moderator:

Title	Speakers
Study on Temperature Measurement of Power Equipment Based on Retinex Theory and Machine Learning	Yang He, Wenmao Li Huazhong University of Science and Technology
Dynamic Inspection Method of Motor Winding Defects Based on Scanning Electromagnetic Thermography and Data Reconstruction Algorithm	Yu Peng Hunan University
A Temperature Identification Method Based on Chromaticity Statistical Features of Raw Format Visible Image and K-nearest Neighbor Algorithm	Wenmao Li Huazhong University of Science and Technology
Analysis of the electromagnetic force distribution and uniform deformation in dual-tube electromagnetic confinement forming	wang zhang China Three Gorges University
Based on MP-DTFC for velocity tracking of permanent magnet synchronous linear motor	Fengrui Cui Naval University of Engineering

Session 16

Tue 03/11 10:30-11:45

Moderator:

Title	Speakers
State Confirmation Method of Circuit Breaker	Yongxin Chen
Research on performance improvement methods of vanadium redox flow battery in microgrid	Zebo Huang Xi'an University of Technology
Construction of Coupling Model and Evaluation of Node Importance for Electric Sensor Communication Network	
Frequency Coupling of Asymmetrical VSC-dominated Power Systems in Small-signal Dynamic Analysis	Rong Zhou Huazhong University of Science and Technology
A No-impact Startup Scheme for Flexible Excitation System based Synchronous Generator in CAES	Peng Yuwei Huazhong University of Science and Technology

Session 17

Tue 03/11 10:30-11:45

Moderator:

Title	Speakers
Speed Sensorless Model Predictive Flux Control of Induction Motor Based on Adaptive Gain Sliding Mode Observer	Zeyu Hu Huazhong University of Science and Technology
Design and Analysis of A Brushless Hybrid Excitation Motor Based on N-S Alternating Pole	Xu Wang Southeast University
Sensorless Direct Torque and Flux Control of IPMSMs Using Pseudo-Random HF Square-Wave Voltage Injection into a Stator Flux Reference Frame	Junlei Chen Southeast University
Sensorless Control Strategy for Multiphase Induction Motor with Stator and Rotor Resistance Identification Based on Injecting Third Harmonic Current	ShengLi Zhejiang University
A NOVEL FAULT DETECTION OF IGBT OPEN –CIRCUIT FAILURE IN FIVE- PHASE OPEN-END WINDING PMSM DRIVE SYSTEM	Chunyang Jiang Harbin Institute of Technology

Session 18

Tue 03/11 10:30-11:45

Moderator:

Title	Speakers
Analytical Modeling and Optimization of LCC Resonant Converter in CCM Based on State Plane Analysis	Zhiyuan Yu Huazhong University of Science and Technology
Research on the Influence of Foreign Object on LCC-LCC Electric Vehicle Wireless Charging System	Xiaozhao Wei Shandong University
Impedance modeling of modular multilevel converter based on multi-harmonic linearization	Chang Xiong, Chenbo Xu Xi'an Jiaotong University
Quasi-PR Control Based Flexible Arc Suppression Method in Power Distribution Networks	Guo Caihong Fuzhou University
Power Balance Strategy of Diode Clamped H-Bridge Cascade Multilevel Inverter	Zhongwei Chen Hunan Key Laboratory of Energy Internet Supply-demand and Operation; the State Grid Hunan Electric Power Company Limited Economic & Technical Research Institute Yang Leng the State Grid Hunan Electric Power Company Limited Economic & Technical Research Institute

Session 19

Tue 03/11 10:30-11:45

Moderator:

Title	Speakers
Analysis of Pulse Transformer Using New Winding Method Based on Electromagnetic Field Simulation	Wei Hu University of South China
Overvoltage measurement method based on non-contact wireless measurement	Wenzhe Zheng Zhejiang Electric Power Co.; Ltd. Research Institute
Research on Noise Characteristics and Filtering of Fiber Optic Current Transformer	yongfeng chai Huazhong University of Science and Technology
Breakdown Characteristics of the Insulating Medium in Foil-film Capacitors Under DC Superimposed Harmonic Voltage at Different Temperatures	Tian Fang Huazhong University of Science and Technology
Polarization-depolarization Current Method for XLPE Cable Insulation Diagnosis	Haiyong Liu Shandong Binzhou Power Supply Company

Session 20

Tue 03/11 10:30-11:45

Moderator:

Title	Speakers
Two-Probe Online Impedance Measurement Setup with Improved SNR and Enhanced Ruggedness	Zhenyu Zhao Nanyang Technological University
A Modified Whale Optimization Algorithm for Electromagnetic Inverse Problems	Boqun Li Zhejiang University
Research on Safety Evaluation of Grounding Grids Based on Binary Interval Numbers	Yifan He Chongqing university
Mid-Range Wireless Power Transfer System Based on Focused and Shielding Metamaterials	minghai Liu Huazhong University of Science and Technology
Magnetic Shielding of Wireless Power Transfer Using Zero Permeability Metamaterial Slab	Conghui Lu Huazhong University of Science and Technology

Session 21

Wed 04/11 09:00-10:15

Moderator:

Title	Speakers
Stability analysis of VSC based on SISO equivalent of MIMO in current control timescale	Yaxin Peng Huazhong University of Science and Technology
Dynamic Economic Dispatch of Power Systems with Optimal Transmission Switching	Mingxuan Lu North China Electric Power University
Thermal Power Characteristics of a Liquid Metal Battery	Guo Zhenlin Huazhong University of Science and Technology
Equilibrium Models of Electricity Market Considering Electric Vehicles and Renewable Energy Trading Priority	Dujiahao Fan Shandong University
Sensitivity Analysis Model of Wind Power Project Cost Influencing Factors Based on Improved LCOE	Yang Ji Tianjin Electric Power Company, State Grid

Session 22

Wed 04/11 09:00-10:15

Moderator:

Title	Speakers
Design and Optimization of a Novel Dual-Rotors Flux-Switching Permanent-Magnet Machine	Wenliang Zhao Shandong University
A Hybrid Single Current Regulator Control Algorithm of PMSMs for High Speed Operation	Lei Zhu Wuhan Institute of Marine Electric Propulsion
EKF for Three-Vector Model Predictive Current Control of PMSM	Yongzihao Dai Huazhong University of Science and Technology
Optimal Design of Speed Controller in PMSM Based on Grasshopper Optimization Algorithm	Dong Chen Shen Zhen LiYuan Water Design & Consultation CO., LTD.
A Similarity-based Feature Extraction Method for Remaining Useful Life Prediction of Bearings	Yujie Zhao Huazhong University of Science and Technology

Session 23

Wed 04/11 09:00-10:15

Moderator:

Title	Speakers
Improved Droop Control Scheme for Reactive Power Sharing of Parallel Inverter System	Huang Xuezheng Huazhong University of Science and Technology
An Emergency Aviation static converter Design Method with High Reliability	Chen Dichang Huazhong University of Science and Technology
Design of a High Efficiency Buck Converter	Wang Zhao Huazhong University of Science and Technology
Selective Harmonic Elimination Control for Cascaded Digital Power Amplifier	Junyao Tu Huazhong University of Science and Technology
Overview of Architectures for Satellite's Regulated Bus Power System	Bowen Zhang Shenzhen Aerospace Science and Technology Innovation Research Institute

Session 24

Wed 04/11 09:00-10:15

Moderator:

Title	Speakers
Effect of Salt Fog and Humidity on Corona Aging Performance of HTV Silicone Rubber Insulating Material	Ya'nan Peng Xi'an Jiaotong University
Effect of High-Speed Train on Vibration and Fatigue Life of Transmission Lines.	Ming Yin Huazhong University of Science and Technology
Influence of Dust on Surface Properties of Epoxy Resin	Pin Lü North China Electric Power University
Simulation of Three Dimensional Temperature Distribution for GIL Insulator based on FVM	Xiaolong Li Shenyang University of Technology
The Influence of Gas Pressure and Voltage on Surface Charge Behavior of Basin Type Insulator	Wei Du Shenyang University of Technology

Session 25

Wed 04/11 09:00-10:15

Moderator:

Title	Speakers
Numerical simulation and experimental results of radial Lorentz force assisted electro-hydraulic sheet forming process	Chen Wang Huazhong University of Science & Technology
Finite Difference Method for Eddy Current Correction in Pulsed Field Magnetometer	Chengzhe Shu Huazhong University of Science and Technology
Research on the influence of structural parameters of augmented linear drive on efficiency	Zunjing Fu University of Chinese Academy of Sciences
Simulation Research on Necking and Fracture of Electromagnetic Expanding Ring Based on Gurson Model	Yong Wan Huazhong University of Science and Technology
Failure Analysis of a 100 Tesla Pulsed Magnet	Houxiu Xiao Huazhong University of Science and Technology

Session 26

Wed 04/11 10:30-11:45

Moderator:

Title	Speakers
Development of a design software for hybrid HVDC	Xilin Yan Shandong University
Research and Application on Power Generation Safety Monitoring and Cloud Platform	peiwen sun, Yijin Xu Huazhong University of Science and Technology
Distributed scheduling of active distribution network with multi-type distributed generation clusters	Shixu Zhang Huazhong University of Science and Technology
Day-ahead optimal dispatch of integrated energy system considering wind power forecasting and integrated demand response	Shuhe Yan, Chang Xiong Xi'an Jiaotong University
Damping Performance Analysis of Power System Electromechanical Oscillations Considering the Proportion and Position of PV Generations	hua chai School of Electric power and Architecture Shanxi University Zheng Huiping State Grid Shanxi Electric Power Company Power Research Institute

Session 27

Wed 04/11 10:30-11:45

Moderator:

Title	Speakers
A Dual Consequent-pole Split-tooth Vernier Machine with Enhanced Modulation Effect	Hailin Huang Huazhong Uni. Of Science and Technology
A Novel Operation Principle of Air-core Pulsed Alternators to Achieve Multiple Railgun Launches	Hanting Zhu Huazhong University of Science and Technology
Vibration Suppression of Magnetic Bearing System based on Active Disturbance Rejection Control with Generalized Integrator Extend State Observer	Hongbo Sun Huazhong University of Science and Technology
Research on Saturation Characteristics and Modeling Method for Transformer Based on J-A Model	Liu Qingsong CSG EHV Power Transmission Company
A Nonzero Vector PWM Method to Reduce Common-Mode Voltage	Xuepeng Gao Huazhong University of Science and Technology

Session 28

Wed 04/11 10:30-11:45

Moderator:

Title	Speakers
An LLC Topology Suitable for Renewable Energy System Applications	
Sequence Impedance Modeling and Stability Analysis of Three-phase Two-stage Power Conversion System	Wenjie Sun
Improved Calculation Method for Inductance Value of the Air-Gap Inductor	xinsheng zhang Naval University of Engineering
Design of an Inductor-Integrated Transformer Applied to Inerter Power Supply	Xinsheng Zhang Naval University of Engineering
Research on a single-phase high-precision inverter based on dual-loop control	Bo Lu Huazhong University of science and technology

Session 29

Wed 04/11 10:30-11:45

Moderator:

Title	Speakers
Magnetization and Demagnetization Characteristics of NdFeB Blocks in Pulsed Magnetic Field	Wu Tian Huazhong University of Science and Technology
Optimization of high-voltage pulse trigger for TDI-type hydrogen thyratron	Yang Zhao, Yong Yang Huazhong University of Science and Technology
Microwave Reflectometer for Density Measurement on J-TEXT Tokamak	Xiehang Ren Huazhong University of Science and Technology
Design of Quasi-Steady Magnet for HUST Field-Reversed Configuration Plasma Device	Jing Liu Huazhong University of Science and Technology
Design of 50kHz Thomson Scattering Diagnostic System on HFRC	Yiming Ma Huazhong University of Science and Technology
Destruction Characteristics of Electric Pulse Discharge	Shijie Huang Huazhong University of Science and Technology

Session 30

Wed 04/11 10:30-11:45

Moderator:

Title	Speakers
A triple-coil electromagnetic two-step forming method for tube fittings	
A Method To Improve Flanging Forming Ability Of Tube Based On Field Shaper	
Study on the Magnet Design and Beam Extraction in a Superconducting Cyclotron	Yan Yan Huazhong University of Science and Technology
Simulation Optimization and Experimental Research on Dynamic Characteristics and Contact Bounce of Inclined Pole Surface AC Contactor	Yuyuan Zhou Fuzhou University
Optimized Electro-Optical Detection System for a FEL-THz Source	Lei Wang Huazhong University of Science and Technology
Simulation Analysis of Fabry Perot Effect in Terahertz Time Domain Spectroscopy	Jiayi Yang Huazhong University of Science and Technology

Young experts session

Session 1

Tue 03/11 14:30-16:00

Moderator:

Non-intrusive load monitoring and residential electricity plan recommendations

Dr. Ke Meng

Senior Lecturer,

School of Electrical Engineering and

Telecommunications, The University of New
South Wales

Email address: ke.meng@unsw.edu.au

Dr Meng received his Ph.D. degree from the University of Queensland, followed by post-doctoral appointments at the Department of Electrical Engineering, the Hong Kong Polytechnic University. In 2012, he transferred to the Centre for Intelligent Electricity Networks at the University of Newcastle as an associate lecturer and was promoted to the research academic in late 2012. In 2015, he joined the University of Sydney as a lecturer in the School of Electrical and Information Engineering. And then he joined the School of Electrical Engineering and Telecommunications in the University of New South Wales as a senior lecturer in energy system in 2018. Dr Ke Meng has 10 years' experience in the design and development of 3GW renewable energy and battery projects in Australia, including system modelling and analysis, renewable generation connection studies and compliance testing. He is a senior member of IEEE, serves as editor of International Transactions on Electrical Energy Systems, member of Journal of Modern Power Systems and Clean Energy editorial board, and member of Electric Power Components & Systems editorial board.

Abstract

This seminar will introduce a data analytics platform developed based years' research. With the non-intrusive load monitoring, a key smart grid services enabling technique, the platform provides estimated break down of electricity usage by appliance category. It also allows customers to compare all generally available electricity plans, considering details such as solar feed-in tariffs, discounts and incentives, key terms and conditions.

The Future for Plasma Discharges: Mechanisms and Novel Applications



Dr. Qing Xiong

Tenured Associate Professor

College of Electrical Engineering, Chongqing University

Email address: qingxiong@cqu.edu.cn

Dr. Xiong received his Bachelor degree from the College of Electrical Engineering at Southwest Jiaotong University (China) at 2007. Afterwards, he started joint doctoral study and received PhD degrees from both the Department of Applied Physics in Ghent University (Belgium) at 2012, and the College of Electrical & Electronic Engineering in Huazhong University of Science & Technology (China) at 2013, in the field of plasma discharges. In 2013 he joined the Chongqing University (China) as a researcher supported by the Hundred Talents Program. He is also a research member in the State Key Laboratory of Power Transmission Equipment & System Security and New Technology, Chongqing University. From November 2013 to July 2014, he was a visiting scholar in the Cold Plasma Diagnostics and Application Lab. at the Department of Mechanical Engineering, University of Minnesota (Twin Cities Campus), USA. His research interests include atmospheric pressure plasma discharges, advanced optical diagnostics, plasma interactions with liquids and solids, and novel applications of plasma discharges in energy and material science. He has been co-authored more than 60 publications, and since 2015 the total citations of his work have achieved to 1596 with h-index 22 and i10-index 36 by GoogleScholar.

Abstract

The application of plasma discharge has assumed a critical, although often hidden, place in many manufacturing processes. Many products that depend on plasma treatments are ubiquitous in modern societies. Integrated Circuits for computers and cells phones are only possible by plasma processing. Surface treatments and modifications of plastics and textiles improve printing, dyeing, adhesion, and biocompatibility properties, as well as either increase or decrease wettability. Other properties such as antimicrobial, self-cleaning, scratch-resistant, and even self-repairing properties are possible by plasma treatments. Plasma-assisted combustion, higher energy efficiencies for cars and for aircraft engines. Plasma thrusters and actuators provide completely new approaches for propulsion and maneuverability of planes and spacecraft. Plasmas provide a highly efficient cleaning way of exhaust pollutant gases, *etc.* Plasma technology has contributed significantly to the economic prosperity of industrialized societies. In this talk a broad review of the success of plasma technologies in various fields will be presented. The behind important mechanisms will be discussed together with several potential novel plasma applications in biomedicine and energy field.



**Shaofeng Jia**

Post-doctor, Associate Professor,
School of Electrical Engineering,
Xi 'an Jiaotong University, China
IEEE Member

Shaofeng Jia (S'14–M'17) was born in Shaanxi Province, China. He received the Bachelor Engineering degree from Xi'an Jiaotong University, Xi'an, China, in 2012, and the Ph.D. degree from the Huazhong University of Science and Technology, Wuhan, China, in 2017, both in electrical engineering. He was a visiting scholar at the University of Sheffield, UK. He is currently an Associate Professor with the School of Electrical Engineering, Xi'an Jiaotong University. He was named one of the top ten young scholars of Xi 'an Jiaotong University in 2019 and was included in the 2019 Forbes Young Talent Under 30 List. He has so far published more than 65 IEEE technical papers. His research interests include design and control of novel electrical machines and magnetic gear.

Abstract

With the rapid development of rail transit, ship electrification, multi-electric/all-electric aircraft, robots, new energy vehicles, and drones, electric machines play a more and more important role nowadays. Flux-modulated machines (FMMs) have been gaining more and more research attention thanks to their extremely super-high torque density. The most remarkable feature of FMMs is that the number of the stator pole pairs and the rotor pole pairs are not equal. With the permeance modulation effect of the iron poles, the mechanical speed of the machine is reduced, and the output torque is increased. The majority of the existing FMMs adopt the traditional pure sinusoidal current. In this presentation, the recent academic research on novel DC-biased current PM and reluctance FMMs is presented. Topology evolution and comparison, operation principle, slot/pole combination relationship, electromagnetic performance, and experimental validation are described.

Development of Electromagnetic Forming Technology at Wuhan National High Magnetic Field Center



Dr. Quanliang Cao

Associate Professor

Wuhan National High Magnetic Field Center &
School of Electrical and Electronic

Engineering, Huazhong University of Science
and Technology

Email address: quanliangcao@hust.edu.cn

Dr. Cao received his Bachelor degree in 2008 and Ph.D degree in 2013, both from School of Electrical and Electronic Engineering, Huazhong University of Science and Technology. Currently, he is an associate professor and doctoral supervisor in the Wuhan National High Magnetic Field Center & School of Electrical and Electronic Engineering, Huazhong University of Science and Technology. His research interests focus on the object manipulation using magnetic fields, including electromagnetic forming, magnetic soft robot, and magnetic separation. He has published more than 20 SCI-indexed papers as the first author or corresponding author, and applied for more than 30 national invention patents.

Abstract

Electromagnetic forming is a high-speed forming technology that uses Lorentz forces to achieve plastic forming of metallic workpieces, showing great potential in the manufacture of lightweight tubes and sheet metals. However, its industrial application is still quite limited due to bottlenecks such as the mechanical stability and thermal stability of tool coils during high-energy or high-cycle discharges, and the poor controllability of Lorentz forces in the existing forming process. To solve these issues, our team has previously developed a new electromagnetic forming technology at Wuhan National High Magnetic Field Center, that is, space-time-controlled multi-stage pulsed magnetic field forming and manufacturing technology. In the past five years, we have focused on the development of multi-coil electromagnetic systems and forming process of light alloy components related to this forming technology, which will be summarized in this talk based on the recently reported work.

Utilization of Increased Degrees of Freedom in Multiphase Drive



Zicheng Liu

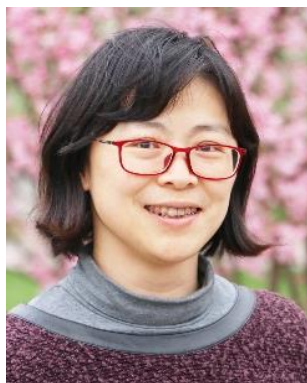
Associate Professor

Huazhong University of Science and
Technology (HUST)

Zicheng Liu (M'18) was born in Shandong, China, in 1989. He received the B.S. degree in Hydropower Engineering from Huazhong University of Science and Technology (HUST), Wuhan, China, in 2011, and the Ph.D. degree in Electrical Engineering from Tsinghua University, Beijing, China, in 2016. During Oct. 2014 to Mar. 2015, he was a Visiting Student at Purdue University, West Lafayette, IN, USA. During Jun. 2016 to Sep. 2018, he was a postdoc researcher at Beijing Jiaotong University, Beijing, China. He is currently an associate professor at HUST. His research interests include multiphase motor control systems and transportation electrification.

Abstract

With the high penetration of power electronic converters in the motor drive applications, the stator phase number of electric machines can break the three-phase constraint set by the power grid. Actually, with the phase number grows, the degrees of freedom for the motor drive will increase. As a result, many advantages will emerge, such as reduced per phase power rating, improved reliability and increased modulation degrees of Pulse Width Modulation (PWM). This talk shows different types of multiphase machines and drive systems, and discusses the utilization of increased degrees of freedom in the coordination of multiple stator phases, fault-tolerant control strategy, optimized PWM techniques in the multiphase drive applications.

Session 2***Tue 03/11 16:30-17:00*****Moderator:****Introduction of the Auxiliary Functions of an Inductive Power Transmission System****Dr. Qianhong Chen**

Professor

College of Automation Engineering, Nanjing
University of Aeronautics and Astronautics

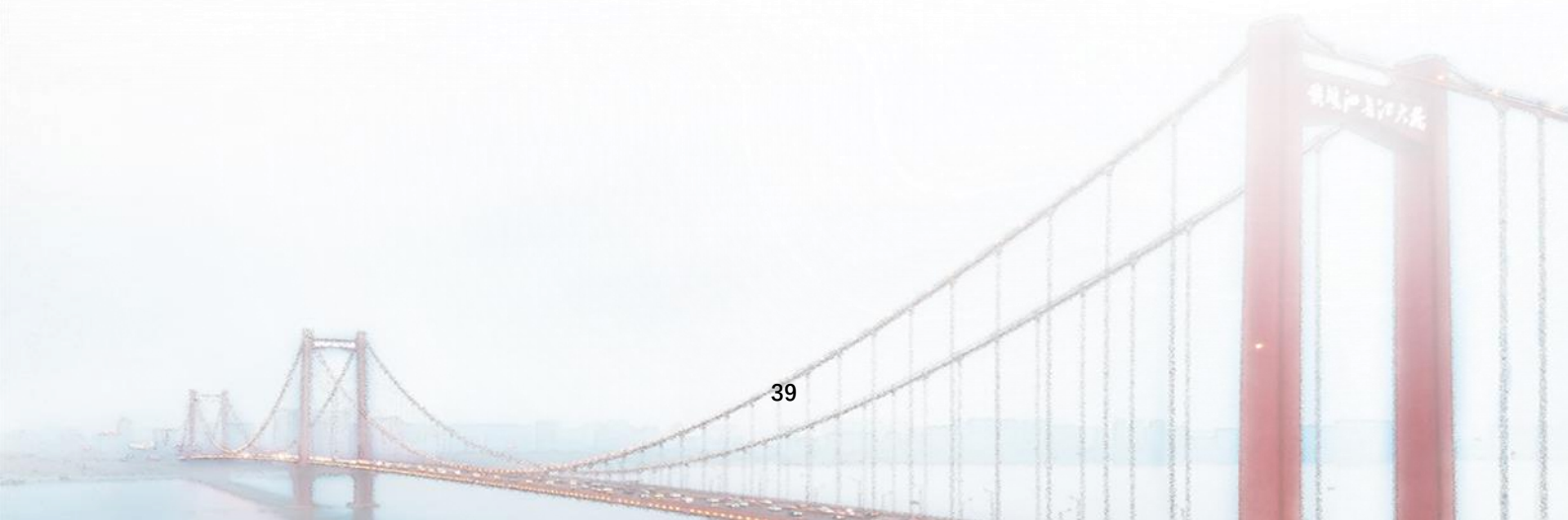
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Dr. Chen received the B.S., M.S., and Ph.D. degrees in electrical engineering from Nanjing University of Aeronautics and Astronautics, Nanjing, China, in 1995, 1998 and 2001, respectively. In 2001, she joined the Teaching and Research Division of the Faculty of Electrical Engineering at Nanjing University of Aeronautics and Astronautics, China, and is currently a professor with the Aero-Power Sci-Tech Center in the College of Automation Engineering. From April 2007 to January 2008, she was a Research Associate in the Department of Electronic and Information Engineering, Hong Kong Polytechnic University, Hong Kong, China. She has published more than 100 papers in international journals and conferences. Her research interests include soft-switching dc/dc converters, application of integrated-magnetics, and contactless resonant converters.

Abstract

Inductive power transmission technology (IPT), which transfers power through magnetic coupling, is safer, more flexible and more convenient, compared to plug-in power transfer solutions. It has found more and more applications, such as personal electronic devices, wearable/implantable electronics, electric vehicles, and so on. A lot of effort has been put to improve the performance of the power transmission, including efficiency, controllability and misalignment tolerance. In addition to the power transmission issues, how to solve the safety and the positioning problems in practical applications is also an urgent problem for an IPT system. Without positioning system, it is very difficult to satisfy the allowable misalignment range for a wireless coupler. The existence of foreign objects may cause overheating and safety problems. To solve abovementioned problems, auxiliary functions including coil positioning, foreign and living object detections have been specified as an essential part for some IPT applications, for example, a commercialized wireless EV charging system.

In this presentation, the auxiliary function requirements of an inductive power transmission system as well as the related technologies will be given. Firstly, a brief introduction of the introducing reason and the requirements of the auxiliary functions, will be presented. Secondly, we will discuss the feasible solutions and the main issues of the position technologies for IPT systems. And then, several foreign object and living object detection methods will be introduced as well as their limitations. Lastly, the information security issues will be mentioned.



A Real-Time Non-invasive Neuromodulation Modality with Transcranial Magneto-Acousto-Electric Stimulation



Dr. Zhang Shuai

Professor,
Vice Dean of the College of Electrical
Engineering, Hebei University of Technology
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Zhang Shuai is a professor in the State Key Lab of Reliability and Intelligence of Electrical Equipment, and vice dean of the College of Electrical Engineering, and vice director of the Institute of Biomedical & Health Engineering at Hebei University of Technology. He is the deputy chairman of the Bioelectrical Professional Committee in China Electrotechnical Society. He has managed almost 10 national and provincial research projects. And He has also organized and hosted international and national conferences as the Session Chair or Track Chair. He has been an Editorial Committee member of Journal of Life Science Instrumentation in China. Dr. Zhang received his Ph. D. degree from the College of Electrical Engineering at Hebei University of Technology (China) at 2009. He acted as a visiting associate in the Department of Biomedical Engineering at University of Minnesota (Twin Cities) from 2013 to 2014. His research interests include bioelectromagnetic technology, neural engineering, bioelectromagnetic Imaging, Electrical Impedance Tomography, magnetoacoustic tomography with magnetic induction, etc.

Abstract

Non-invasive brain neuromodulation is indispensable to the study of brain function. It has also been proven effective for treating some neurological disorders. As a novel method for brain neuromodulation, Transcranial Magneto-Acousto-Electric Stimulation (TMAES) does not need surgery and genetic alteration, it also owns higher spatial resolution and deeper penetration than other non-invasive methods such as transcranial direct current stimulation and transcranial magnetic stimulation. It has not been explored before although the intramembrane mechanoelectrical effect plays an important role in the firing activity of neuron. Membrane capacitance of neuron changes under the function of ultrasonic radiation force. In this talk, we will show a multiscale model, and the neuron firing behaviors based on this model under the Magneto-Acousto-Electric effect are studied. How TMAES modulates neural firing activity will also be shown. The numerical experiment shows that parameter values of TMAES determine the current density, resulting in different firing behaviors and different neuron firing patterns. The results further highlight the role of Magneto-Acousto-Electric effect in neural excitation. They help illuminate sub-threshold and novel physical cellular effects, and may be useful in finding better methods for real-time non-invasive neural control.



Overview of High-frequency Wireless Power Transfer and Its Design Aspects



Dr. Chengbin Ma

Associate Professor (Tenured)

The University of Michigan-Shanghai Jiao

Tong University Joint Institute, Shanghai Jiao

Tong University

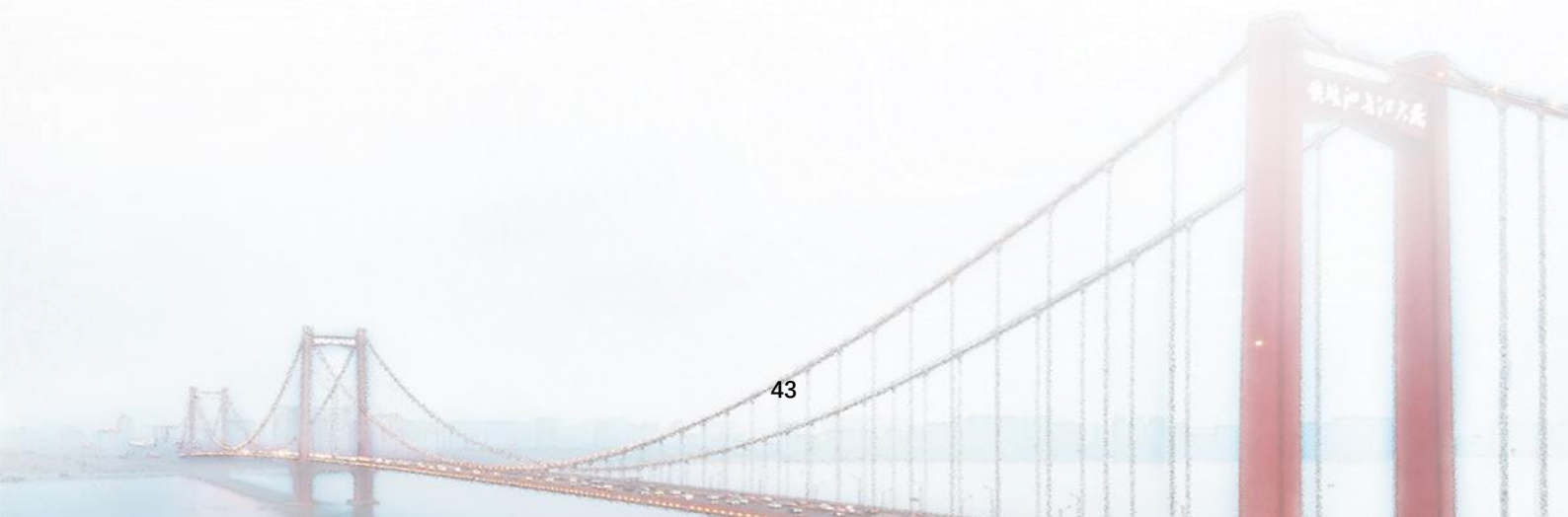
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Dr. Chengbin Ma received the B.S. degree in industrial automation from East China University of Science and Technology, Shanghai, China, in 1997, and the M.S. and Ph.D. degrees in electrical engineering from The University of Tokyo, Tokyo, Japan, in 2001 and 2004, respectively. From 2004 to 2006, he was an R&D Researcher with the Servo Motor Laboratory, FANUC Limited, Japan. Between 2006 and 2008, he was a Postdoctoral Researcher with the Department of Mechanical and Aeronautical Engineering, University of California, Davis, USA. In 2008, he joined the University of Michigan-Shanghai Jiao Tong University Joint Institute, Shanghai Jiao Tong University, Shanghai, China, where he is currently an Associate Professor of Electrical and Computer Engineering. His research interests include battery and energy management, wireless power transfer, dynamics and motion control, and wide applications in electronic devices, electric vehicles, microgrids, smart grids, etc. Dr. Ma was the recipient of many teaching and research awards at Shanghai Jiao Tong University, such as Teaching and Education Award in 2020 and Koguan Top Ten Research Group Award in 2014. He also received Research Excellence Award from AirFuel Alliance, USA, in 2019. He is an Associated Editor for the IEEE Transactions on Industrial Informatics and IEEE Journal of Emerging and Selected Topics in Industrial Electronics. He serves as Delegate of Energy Cluster, and Chair of Shanghai Chapter, IEEE Industrial Electronics Society.

Abstract

Wireless charging or wireless power transfer (WPT) provides a convenient and viable solution without the need for major breakthrough in today's battery technology, especially in terms of energy density. At present, WPT operating in the high-frequency band, such as at 6.78 MHz, is widely regarded as a promising candidate technology for the mid-range transfer of a medium amount of power. Physically, a higher operating frequency improves the spatial freedom of power transfer and also makes it possible to develop a more compact and lighter WPT system. At the same time, due to the high-frequency operation, circuit-level complexity and multiple objectives in the actual MHz WPT systems, system-level analysis and design are particularly important for achieving high performance (e.g., high efficiency, low noise, and robustness) of a final system. In this speech, the main power conversion topologies are first briefly reviewed and compared; then, taking the Class E² topology as an example, a systematic methodology is explained to model and design a complete MHz WPT system; finally, the methodology is further extended to multiple-receiver MHz WPT systems, where the robustness of operation is particularly emphasized. The developed modeling and design methods are based on the impedance analysis of each component from the final load, rectifier, coupling coils, to power amplifier. Therefore, this methodology itself, i.e., the design concept, is universal for MHz WPT systems using other representative circuit topologies.



Development and Challenges in Very High Frequency Power Conversion



Dr. Yueshi Guan

Associate Professor

Harbin Institute of Technology

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Dr. Guan received the B.S., M.S. and PH.D. degrees in electrical engineering from Harbin Institute of Technology, China, in 2013, 2015 and 2019, respectively. Since 2019, he has been an associate professor with the Department of Electrical and Electronics Engineering, Harbin Institute of Technology. His research interests are in the areas of high frequency and very high frequency converters, single-stage AC/DC converter, and LED lighting systems. He has authored more than 50 conference and journal papers. He received Nomination Award of Young Engineer Award of PCIM Asia Conference in 2019, the Second Prize Paper Award from IEEE Transactions on Power Electronics, as well as Best Paper awards of ICEMS 2019, SPEED 2019, ITEC Asia-Pacific 2017. He is also the corresponding guest editor of JESTIE and served as the special session chair of IEEE ICEMS 2019, IEEE ECCE-Asia 2020.

Abstract

With the fast development of power electronics, there is an increasing need for small volume, high power density and fast response power conversion equipment in the fields of lighting, data center power system, wireless power transfer, industrial robot and other applications. Improving the operating frequency is the fundamental strategy to reduce the value, volume of passive components, which can effectively reduce the system volume. With the development of wide bandgap (WBG) devices, the operating frequency can be pushed up to tens of MHz, where the power electronic conversion technology comes into the era of very high frequency (VHF). However, many challenges come with the tremendous increment of operating frequency, such as large switching loss, large driving loss and large magnetic component loss, which investigate and overcome in recent years. In this talk, the development and challenges of VHF power converters will be presented, including the components, topologies, and driving methods.

Radiated Emission Prediction of SMPS Based on Field-Circuit Co-Simulation**Dr. Yan Wei**

Associate Professor

School of Electrical and Automation

Engineering, Nanjing Normal University

Email address: 61197@njnu.edu.cn

Dr. Yan received his Bachelor degree from the School of Math and Physics at Nanjing University of Information, Science & Technology at 2008. And he received his Master degree from the School of Electrical and Automation Engineering at Nanjing Normal University at 2011. Afterwards, he started doctoral study and received PhD degree from the School of Physics and Technology at Nanjing Normal University at 2014. In 2014, he joined Nanjing Normal University as a lecturer. From November 2016 to October 2020, he was a postdoctor in the Key Laboratory of Advanced Technology for Small and Medium-sized UAVs, Nanjing University of Aeronautics and Astronautics. From July 2017, he is an associated professor and the Deputy Director of Jiangsu Engineering Key Lab of Electrical Equipment and Electromagnetic Compatibility, Nanjing Normal University. He is also the communication committee member of National Radio Interference Standardization Technology A Subcommittee, member of National Integrated Circuit Electromagnetic Compatibility Standard Working Group, member of Electromagnetic Compatibility Committee of China Power Supply Society and obtain the Jiangsu Innovation & Entrepreneurship Talent Technology Program. His research interests include electromagnetic interference generated by devices and ICs, electrostatic discharge (ESD) immunity, electrical fast transient burst (EFT) immunity, Surge immunity, very fast transient overvoltage (VFTO) mechanism, electromagnetic environment effects (E3) and nanothermal ablation of tumor. He has been co-authored more than 100 publications and obtains 13 national invention patents.

Abstract

Switching model power supplies (SMPS) are widely used in applications ranging from small consumer electronics to large industrial equipment. Most SMPS employ switching devices that rapidly and repeatedly change states producing high-frequency electromagnetic interference (EMI) due to the large di/dt and dv/dt in the circuit waveforms. The prediction of far-field EMI for SMPS can not only shorten the production cycle and reduce the measurement cost, but also can provide a very valuable reference for the EMC design of SMPS. In this talk a radiation prediction method of SMPS is proposed to predict the noise level of SMPS in the standard measurement of the 3m semi-anechoic chamber, and divides the SMPS into power cables, PCB and shell. The power cable serves as a radiation antenna, the PCB circuit containing the switching device and the digital chip serves as the radiation source, and the shell serves as a measure to eliminate the radiation of the PCB. First, the shell of the SMPS is used to eliminate the influence of the radiation caused by the PCB on the estimation accuracy. Then, the excitation signal of the radiation is obtained through full-circuit simulation. In circuit simulation, intelligent algorithms and other technologies will be employed to establish high-frequency equivalent circuit models of related devices. Finally, the improved antenna model is employed to achieve the final radiation prediction.



Poster session

Session 1

Wed 04/11 14:30-15:30

Moderator:

Title: Voltage-Source Control of DFIG in Standalone Wind Power-Based Microgrids Authors: Hai Xiao, School of automation, Guangdong University of Technology
Title: Multi-objective Two-level Planning Strategy for the Integrated Energy-Intelligent Transportation System Coupling Network Authors: tiange li, zhijian hu, School of Electrical Engineering and Automation, Wuhan University
Title: Frequency Coupling Characteristic Impedance Model and Stability Analysis of Modular Multilevel Converter Authors: Bo Yue, Xuan Li, State Grid Economic and Technological Research Institute Co., Ltd. ; Qiao Kang, Yue Wang, Zhuling Li, Fengmo Li, Xi'an Jiaotong University
Title: Consumer-Aware Reliability Evaluation and Outage Loss Compensation Method for Smart Grid Authors: Liyang Liu, State Grid Sichuan Economic Research Institute; Qi Liu, Tianjin University; Wentao Zhang, Jun Wei, Shengyong Ye, State Grid Sichuan Economic Research Institute
Title: An Information Fusion Charging Optimization Model Authors: Tao Ma, State Grid Hebei Electric Power Co., Ltd. Xiong'an New District Power Supply Company
Title: A Method of Power Supply Time Period Division Based on Optimal Division Method Authors: Tao Ma, State Grid Hebei Electric Power Co., Ltd. Xiong'an New District Power Supply Company
Title: Neural Network Based on Immune Algorithm for Restoration in the Power Distribution System Authors: Qiang Ji, Yuting Li, Chang Ye, Shaorong Wang, School of Electrical and Electronic Engineering, HUST
Title: Installation Optimization for Inhibiting Multi-infeed HVDC Commutation Failure Authors:
Title: Corrective Power Network Reconfiguration for Eliminating Transmission Lines Overload Authors: Liwei Zheng, Zhengqi Xu, State Grid Fujian Electric Power Company; Jing Kuang, Zhejiang University; Ye Han, Yingling Zhang, State Grid Fujian Electric Power Company; Ruipeng Guo, Zhejiang University
Title: Study on the Corresponding Relationship Between Critical Points of P-V Curve and V-Q Curve of Simple Thevenin Equivalent System Authors: Xuan Li, NARI GROUP (State Grid Electric Power Research Institute) ; Linlin Guan, State Grid Electric Power Research Institute
Title: Effects of Frequency and Voltage Relays on Turbine-Generator Shaft Fatigue due to Islanding Authors: Bombay Babi, University of Johannesburg
Title: Optimal method of lightning protection for power grids considering economic loss by voltage sag Authors: Zhiyang Yao, Weidong Chen, Qingren Jin, Min Guo, Shiya Ruan, the Electric Power Research Institute of Guangxi Power Grid Co., Ltd

Session2

Wed 04/11 14:30-15:30

Moderator:

Title: Sensitivity Analysis of Input and Output Characteristics Based on Parameters Deviation of Compensation Network in IPT System

Authors: Li Ming, Zhang Xuebing, Peng Song, Yang Zhi, Yue Ming, The GAC R&D Center

Title: High Voltage Conversion Ratio Bidirectional DC/DC Converter With Digital Adaptive Frequency Modulation

Authors: Qianfan Zhou, Zhinxiang He, Zongjian Li, Hunan University

Title: A Datasheet-Based Loss Model and Efficiency Analysis for Vienna Rectifiers Using SiC Power Devices

Authors: Weijie Hua, Li Peng, Teng Liu, Cai Chen, Xinmin Liu, Yong Kang, Huazhong University of Science and Technology

Title: Series-type Trans-Z-source Inverter with Coupled Inductor

Authors: Xupeng Fang, Qingqing Wang, Zhongming Qi, Weishuo Zhang, Shandong University of Science and Technology

Title: A Low-cost Hybrid Back-to-Back Soft Open Point

Authors: Xuefeng GE, Ltd. Research Institute; State Grid Jiangsu Electric Power Co.

Title: A New Screening Method for Alleviating Transient Current Imbalance of Paralleled SiC MOSFETs

Authors: Yizhe Liu, Hunan University; Xiaoping Dai, Coresing Semiconductor Technology Co.,Ltd.; Xi Jiang, Hunan University; Fang Qi, Yang Liu, Pan Ke, Yongzhi Wang, Coresing Semiconductor Technology Co.,Ltd.; Jun Wang, Zhong Zeng, Hunan University

Title: Three-port Network for Single-Stage Bridgeless LED Driver with Power Pulsation Decoupling Capabilities

Authors: hanlei tian, Sichuan University; yiwen xia, guozhuang liang, Hebei University of science and technology

Title: Analysis of the Flying-Capacitor Modular Multilevel Converter Based on SiC MOSFET

Authors: Kaiyuan Jing, The School of Electrical and Electronic Engineering, Huazhong University of Science and Technology

Title: Dq Admittance Prediction of Grid-Tied VSCs Under Variable Operating Conditions

Authors: Qi Qiu, Rui Ma, Yifan Huang, Meng Zhan, Huazhong University of Science and Technology; State Key Laboratory of Advanced Electromagnetic Engineering and Technology

Title: Current Sharing Structure Analysis and Design of High-Current Thyristor Converters Based on PEEC Method

Authors: Yong Yang, Huazhong University of Science and Technology

Title: Coordinated Voltage Control Strategy for Distribution Network with Power Electronic Transformer and Photovoltaic Power Supply

Authors: Min Zhang, Shanxi Electric Power Research Institute; Zhixuan He, North China Electric Power University

Title: Virtual Resistor/Capacitor Droop Control based Power Allocation Strategy for Virtual Synchronous Generator

Authors: Dai Jiaoyang, Dai Jiaoyang, Zhou Jianyu, Shi Mengxuan, Chen Xia, Wen Jinyu, Huazhong University of Science and Technology

Session3

Wed 04/11 14:30-15:30

Moderator:

<p>Title: A Novel Rotor-side Converter Topology of Doubly-fed Wind Turbine Based on H-Bridge</p> <p>Authors: Chao Meng, Rende Zhao, Cheng Yuan, Congcong Xuan, School of New Energy, China University of Petroleum (East China)</p>
<p>Title: Model Predictive Direct Torque Control of Induction Motor Based on Online Parameter Identification</p> <p>Authors: Hengyu Guan, Zeyu Hu, Chao Gao, Jian Xiong, Kai Zhang, Huazhong University of Science and Technology</p>
<p>Title: Test Device for Evaluating Electrical Contact Properties of Contact Materials Based on Eddy Current Repulsion Mechanism</p> <p>Authors: Rixia Wang, Xiangjun Liu, Fuzhou University</p>
<p>Title: A Notch Filter-Based Active Damping Strategy for Resonance Mitigation in LC-filtered SPMSM</p> <p>Authors: Xiao Xu, Rende Zhao, College of New Energy;China University of Petroleum (Eastern China)</p>
<p>Title: Research on the Performance of SPM Servo Motor with Different slot-pole Combinations</p> <p>Authors: Huang Muxing, Xu Qiang, lei xu, Jiang Tao, Huazhong University of Science and Technology</p>
<p>Title: Analysis of frequency control system in single-phase asynchronous motor</p> <p>Authors: Kedi Yao, Houxiu Xiao, Huazhong University of Science and Technology</p>
<p>Title: Application of PMSM Sensorless Control System on Lower Limb Rehabilitation Robot</p> <p>Authors: Qingjun Li, Xiuhe Wang, Lingling Sun, Zhong Liu, Shandong University</p>
<p>Title: Study on Asynchronous Torque of Brushless Double-Fed Machine with Negative Pole-pairs</p> <p>Authors: Cheng Yuan, Yu Bo, Kan Chao hao, HeFei University of Technology</p>
<p>Title: Direct torque control of synchronous reluctance motor in M-T reference frame considering magnetic circuit saturation and cross saturation</p> <p>Authors: Ao Zhang, Ying Fan, Junlei Chen, Southeast University</p>
<p>Title: Optimization of PM-Assisted Synchronous Reluctance Motor with Asymmetric Rotor</p> <p>Authors: Yan Liu, Wenliang Zhao, Zhishuo Yang, Xiuhe Wang, Shandong University</p>
<p>Title: Image Transfer Applied in Electric Machine Optimization</p> <p>Authors: sichao yang, Hitachi (China) Research and Development Corporation</p>
<p>Title: Stability Analysis and Improvement of an V/f controlled Induction Motor Drive Taking the Effect of Inverter Deadtime</p> <p>Authors: Zhenwen Zeng, Wenxiang Song, School of Mechatronic Engineering and Automation, Shanghai University</p>
<p>Title: Optimization of Magnetic Pole Structure of High-speed Permanent Magnet Synchronous Motor Weakens Cogging Torque</p> <p>Authors: Yin Xinjian, Xiangtan University</p>
<p>Title: Demagnetization Analysis and Magnet Design of Permanent Magnet Synchronous Motor For Electric Power Steering Applications</p> <p>Authors: Weihua Huang, Jin Wang, Junchen Zhao, Libing Zhou, Huazhong University of Science and Technology; Zhiwei Zhang, The Ohio State University</p>
<p>Title: Design and analysis of permanent magnet vernier motors for downhole applications</p> <p>Authors: Zheng Chen, Huazhong University of Science and Technology</p>

Session4

Wed 04/11 14:30-15:30

Moderator:

<p>Title: Classification of the Distributed Capacitance and Voltage Distribution of V-Arranged Triple-Break Series Vacuum Circuit Breakers</p> <p>Authors: Xue Liu, Xiaofei Yao, Liqiong Sun, Zhiyuan Liu, Jianhua Wang, Yingsan Geng, Xi'an Jiaotong University</p>
<p>Title: A Density Based Convective Storm Identification Method For Radar Data</p> <p>Authors: Zhuoyu Zhang, Jin Yang, Zhenghao He, Huazhong University of Science and Technology</p>
<p>Title: Application of Video Synchronos Monitoring Technology on Double Terminal Voltage in Submarine Cable Voltage withstand Test</p> <p>Authors: Jian He, Electric Power Research Institute; State Grid</p>
<p>Title: Study on Chain Arc Extinguishing under the Action of Explosion Flow</p> <p>Authors: Zitong Yang, Qingyi Li, Chen yuning, Jufeng Wang, Guangxi University; Shangshi Huang, Guilin University of Electronic Technology</p>
<p>Title: A Current Transformer Saturation Time Difference Method for Detecting Out Of Zone Fault Using Mathematical Morphology</p> <p>Authors: Ather Khan, Nanjing University Of Science and Technology</p>
<p>Title: Diagnosis and Analysis of a 110kV Oil-immersed Current Transformer with Partial Discharge Defects</p> <p>Authors: Qiong Wang, the Inner Mongolia Electric Power Science & Research Institute, Inner Mongolia Grid</p>
<p>Title: Research on supersonic and subsonic vacuum arc simulation</p> <p>Authors: Ke Sun, Ling Dai, Lingfeng Xiang, Fuchang Lin, Huazhong University of Science and Technology</p>
<p>Title: Structure design of pulse power module based on vacuum polarity effect</p> <p>Authors: SiyuWang, Ling Dai, Huazhong University of Science and Technology; State Key Laboratory of Advanced Electromagnetic Engineering and Technology</p>
<p>Title: Application of Video Synchronous Monitoring Technology on Double Terminal Voltage in Submarine Cable Voltage withstand Test</p> <p>Authors: Wenzhe Zheng, Zhejiang Electric Power Co., Ltd. Research Institute</p>
<p>Title: Overvoltage measurement method based on non-contact wireless measurement technology</p> <p>Authors: Wenzhe Zheng, Zhejiang Electric Power Co., Ltd. Research Institute</p>
<p>Title: A Density Based Convective Storm Identification Method For Radar Data</p> <p>Authors: Zhuoyu Zhang, Jin Yang, Zhenghao He, Huazhong University of Science and Technology</p>
<p>Title: Calculation and Analysis of VFOT under Different Reignition Arc Models of Isolating Switch</p> <p>Authors: Ruming Feng, Inner Mongolia Power Research Institute</p>

Session5

Wed 04/11 14:30-15:30

Moderator:

Title: Numerical Investigation on Influence of Ambient Electric Field on Error Characteristic of Capacitive Voltage Transformer

Authors: Tianyi Liu, Huazhong University of Science and Technology; Huan Wang, the China Electric Power Research Institute; Dezhi Chen, Huazhong University of Science and Technology

Title: Radial and Axial Temperature Distribution of Nano-second Pulsed Spark

Authors: TIANSHU LUO, YONG YANG, Huazhong University of Science and Technology

Title: Real-time evaluation method for measurement error of capacitor voltage transformer

Authors: Ma Keqi, Jiang Tao, Meng Zhan, Huazhong University of Science and Technology

Title: Uncertainty Estimation of Voltage Measurement Methods Based on the E-Field Integration

Authors: Xiaojun Yan, Chongqing University; Chuan Fan, Shibe Power Supply Branch of State Grid Chongqing Electric Power Company; Wei Yi, Dezong Zhou, Rong Su, Dalong Wang, Southern Offshore Wind Power Joint Development Co., LTD.

Title: Factors on Ohm Loss of Converter Transformer Wall Bushing Plugging

Authors: Ruixiang Tao, Xuesong Dong, Tianyan Luo, JunHua Hu, the State Grid Zhejiang Electric Power Company

Title: The Design of Power Quality Calibrator based on FPGA

Authors: Xiya Chen, Kaicheng Li, State Key Laboratory of Strong Electromagnetic Engineering and New Technology, School of Electrical and Electronic Engineering, Huazhong University of Science and Technology

Title: Design of ultra-wideband folded antenna for ground penetrating radar

Authors: Gang Li, Jiayi Mi, Yizhuo He, Tianhao Wang, Jilin University

Title: Ozone Emission and Electric Characters of Wire-plate Corona Discharge

Authors: Yehong Hu, Yong Yang, the State Key Laboratory of Advanced Electromagnetic Engineering and Technology, School of Electrical and Electronic Engineering, Huazhong University of Science and Technology

Title: Global Loss and Hot-Spot Temperature Evaluation of Three-Phase Medium-Frequency Transformer With Different Winding Configurations

Authors: Bin Chen, Xu Liang, Jian Chen and Xiaobin Qin, the College of Electrical Engineering & New Energy (China Three Gorges University), the Hubei Provincial Engineering Technology Research Center for Power Transmission Line (China Three Gorges University); Nina Wan, the Yichang Electric Company (State Grid Hubei Electric Power Company)

Title: Numerical Simulation of ICP source Impedance and Experimental Verification

Authors: LEI ZHOU, * DONG LI, School of Electrical and Electronic Engineering, Huazhong University of Science and Technology

Title: Experimental study on the Charging of Particle

Authors: Xingwei Li, Yong Yang, the State Key Laboratory of Advanced Electromagnetic Engineering and Technology, School of Electrical and Electronic Engineering, Huazhong University of Science and Technology

Title: New Topology of Inductive Energy Storage Pulse Power Supply for Electromagnetic Launch

Authors: Yanling Wen, Ling Dai, Jianhua Miao, Siyu Wang, Fuchang Lin, State Key Laboratory of Advanced Electromagnetic Engineering and Technology and Key Laboratory of Pulsed Power Technology (Huazhong University of Science and Technology)

Session6

Wed 04/11 15:30-16:30

Moderator:

<p>Title: A Multi-Process Hybrid Communication Network and Its Application in EMS for Micro-grid</p> <p>Authors: Guozhu Chen, Tingting Xu, Ranchen Yang, Yuting Shao, Zhejiang University</p>
<p>Title: Adaptive Form of Generator Stator Ground Fault Protection for the Floating Nuclear Power Plant Grid-Source Direct Connection System</p> <p>Authors: Wen Xu, Xianggen Yin, Yikai Wang, Jian Qiao, Huazhong University of Science and Technology</p>
<p>Title: A method for predicting faults level in active distribution network based on feature engineering and XGBoost</p> <p>Authors: Yuqin Xu, State Key Laboratory of Alternate Electrical Power System with Renewable Energy Sources; Zhen Yue, Nan Fang, North China Electric Power University</p>
<p>Title: Analysis of the Helping Effect for Transformer Circulating Current in Delta Winding</p> <p>Authors: Wenbin Cao, Xuanwei Qi, State Grid Zhejiang Electrical Power Research Institute; Xianggen Yin, Maolin Wang, Yuanlin Pan, the State Key Laboratory of Advanced Electromagnetic Engineering and Technology</p>
<p>Title: Application of WE-AE-BP Method to Electric Shock Faults Identification in the Low-voltage Distribution Network</p> <p>Authors: Wu Shuang, Lin Shuyue, Guo Mou-fa, Fuzhou University</p>
<p>Title: Faulty Feeder Detection Method for Pole-to-ground Fault in Radial Flexible DC Distribution Networks</p> <p>Authors: Yang Chang-qing, Guo Mou-fa, Fuzhou University; Li Min-yu, State Grid Fujian Fuzhou Electric Power Supply Company</p>
<p>Title: Day-ahead optimal dispatch of integrated energy system considering wind power forecasting and integrated demand response</p> <p>Authors: Shaoqi Yu, Shuhe Yan, Xingyang Liu, Bin Liu, Chang Xiong, Jiachen Liu, Xi'an Jiaotong University</p>
<p>Title: Research on Design and Security application of AVC System in Plant Station under Interconnected Power Grid</p> <p>Authors: HuangCHao, CGNPC</p>
<p>Title: Suppression Effect of TCSC on Sub-Synchronous Oscillation of Grid Integrated DFIG</p> <p>Authors: Sicheng Wu, Haishun Sun, Yingsheng Han, Biye Huang, Yujie Mao, School of Electrical and Electronic Engineering, Huazhong University of Science and Technology</p>
<p>Title: Research on operation Risk Prevention and Control Technology of Intelligent Distribution</p> <p>Authors:</p>
<p>Title: Design of anti-rust scheme of transmission tower based on the distribution characteristics of rust factor</p> <p>Authors: Hao Liu, State Grid Economic and Technological Research Institute</p>
<p>Title: Operation Analysis of Electromagnetic Loop Network in Distribution Network Based on Physical Test and Simulation</p> <p>Authors: Tao Jinsong, School of Electrical Engineering and Automation, Wuhan University</p>

Session7

Wed 04/11 15:30-16:30

Moderator:

<p>Title: Comparison of thermal performance between parallel MOSFETs and IPM</p> <p>Authors: Kunpeng Fan, Jian Luo, Zhihui Jin, Boyang Li, Shanghai University</p>
<p>Title: Parallel Research of POWER MOSFETs based on SVPWM Algorithm</p> <p>Authors: Boyang Li, Jian Luo, Zhihui Jin, Kunpeng Fan, Shanghai University</p>
<p>Title: Design and Analysis of an Isolated Constant Current to Constant Current Converter with Capacitor Transferring Energy</p> <p>Authors: Lei Wang, Xichen Wang, Xuejun Zhou, Shang Chen, College of Electronic Engineering, Naval University of Engineering</p>
<p>Title: Analysis and Research on Power Quality of Electrified Railway</p> <p>Authors: Sheng Wangqun, China Railway First Survey And Design Institute Group Co.,Ltd; Li Yanzhe, School of Automation & Electrical Engineering, Lanzhou Jiaotong University</p>
<p>Title: Review on Transient Power Angle Stability of System with Doubly-fed Induction Generator Based on Virtual Synchronous Generator</p> <p>Authors: Xuekun Cheng, Hui Liu, Peng Song, State Grid Jibei Electric Power Research Institute</p>
<p>Title: Analysis of Compensation Topology of Magnetically Coupled Wireless Energy</p> <p>Authors: Xiaoyu Zou, Xiaobin He, Jianyu Lan, Shanghai Institute of Space Power-Sources</p>
<p>Title: On-line detection of transformer excitation parameters based on fundamental wave extraction</p> <p>Authors: Yinqing Zhang, Rende Zhao, College of New Energy; China University of Petroleum (Eastern China)</p>
<p>Title: Fault Diagnosis for IGBTs Open-Circuit Faults in Photovoltaic Grid-Connected Inverters Based on Statistical Analysis and Machine Learning</p> <p>Authors: Hongyu Long, Mingyao Ma, Weisheng Guo, Fei Li, Xing Zhang, HeFei University of Technology; School of Electrical Engineering and Automation</p>

Session8

Wed 04/11 15:30-16:30

Moderator:

Title: Summary of power control strategies for primary frequency regulation in wind farms

Authors: Ran Xin, University of Chinese Academy of Sciences; Institute of Electrical Engineering, Chinese Academy of Sciences; Ling Yuan, GUODIAN UNITED POWER TECHNOLOGY COMPANY LTD; Yanfeng Meng, Shuju Hu, University of Chinese Academy of Sciences; Institute of Electrical Engineering, Chinese Academy of Sciences; Runhong Huang, Electric Power Research Institute, CSG

Title: Research on the Control Strategy of Reducing Wind Power Planning Deviation Based on Hybrid Energy Storage

Authors: Huan Jia, Inner Mongolia University of Technology

Title: Refined Load Pattern Recognition Based on Double-layer ISODATA Clustering and SVM

Authors: QingZhuWan, North China University of Technology

Title: The Development of Jiangsu Power Grid in 2016-2020

Authors: Zhongxi Liu, Hao Tian, Jiangsu Keneng Power Engineering Consulting Co., Ltd.

Title: Analysis on the Calculation and Allocation Method of Unbalanced Cost under Current Spot Market Construction in China

Authors: Dianning Wu, Kunming Power Exchange Center Company Limited; Peng Liu, Wuhan University, School of Electrical Engineering and Automation; Minghui Yan, Kunming Power Exchange Center Company Limited; Xue Cui, Liujun Liu, Jun Chen, Wuhan University; School of Electrical Engineering and Automation

Title: Design of a special crawler crane for substation

Authors: Longbin Zhang, China Three Gorges University

Title: An Intelligent Digital Secretary for Design of Electric Power Engineering

Authors: Yiqi Lu, Huazhong University of Science & Technology; Jinghai Xie, Shihua Lu, State Grid Jibei Economic Research Institute; Beijing Jingyan electric power engineering design co., LTD; Chuye Hu, Huazhong University of Science and Technology; Ying Xu, State Grid Jibei Economic Research Institute; Beijing Jingyan electric power engineering design co., LTD; Shaorong Wang, Huazhong University of Science and Technology

Title: Efficiency Evaluation of Power Market and Standardization Design of Electricity Transaction

Authors: Dongyuan Yang, Kunming Power Exchange Center; Liujun Liu, School of Electrical Engineering; Wuhan University; Bangcan Wang, Kunming Power Exchange Center; Yi Du, State Grid Wuhan Power Supply Company; Mengfei Xie, Peishan He, Kunming Power Exchange Center

Session9

Wed 04/11 15:30-16:30

Moderator:

Title: Statistical Analysis of GIS Defects and Major Condition Parameters

Authors: GongYanPeng, shuai yuan, China Electric Power Research Institute; qingzhu yang, North China Electric Power University; shaoan wang, Electric power research institute of state grid Zhejiang electric power company; Yangchun Cheng, State Key Laboratory of Alternate Electrical Power System with Renewable Energy Sources; North China Electric Power University; jun zhao, State Grid Hebei Electric Power Research Institute

Title: Discharge characteristics of DC self-pulse touchable plasma jets

Authors: Xu jiaxing, nie lanlan, lu xinpei, Huazhong University of Science and Technology

Title: Effects of Nonionic Surfactant and Repairing Agent Contents on the Performance of Clean-Repairing Agent for Silicon Rubber

Authors: Gao Song, State Grid Jiangsu Electric Power Research Institute

Title: Internal Fault Diagnosis and Analysis of a 1000kV Shunt Reactor with Abnormal Ground Current of Iron Core and Clamp

Authors: Lin Zhao, ShaoheWang, Yiming Zheng, the Equipment Technology Center, State Grid Zhejiang Electric Power Research Institute

Title: Research on water absorption characteristic of cycloaliphatic epoxy resin insulator

Authors: Li Yin, Chong Zhang, Wei Yang and Bingyue Yan, State Key Laboratory of Advanced Power Transmission Technology, Global Energy Interconnection Research Institute Co., Ltd.; Ye Tian, Electric Power Research Institute of State Grid Liaoning Electric Power Co., Ltd.; Yuhao Liu, Yunsong Wang, Engineering Laboratory of Power Equipment Reliability in Complicated Coastal Environments, Tsinghua Shenzhen International Graduate School, Tsinghua University

Title: Simulation of Three-Dimensional Temperature Distribution for GIL Insulator based on FVM

Authors: Wei Du, State Grid Zhejiang Electric Power Research Institute; Zikun Zhao, State Grid Tianjin Electric Power Company; Xiaolong Li, Chen Cao, School of Electrical Engineering, Shenyang University of Technology; Wen Wang, China Electric Power Research Institute Co., Ltd.

Title: Factors on Ohmic Loss of Converter Transformer Wall Bushing Plugging

Authors: Ruixiang Tao, Xuesong Dong, Tianyan Luo, JunHua Hu, the State Grid Zhejiang Electric Power Research Institute

Title: Simulation and Experimental Analysis of DC Arc Characteristics in Metal Splitter Plate

Authors: Xin Huang, Xiangjun Liu, College of Electrical Engineering and Automation, Fuzhou University

Session10

Wed 04/11 15:30-16:30

Moderator:

- | |
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| <p>Title: The Magnetic Diagnostics for MHD Researches and the Detection of Locked Modes on J-TEXT</p> <p>Authors: Dongliang Han, Chengshuo Shen, *Nengchao Wang, Daojing Guo, Da Li, Feiyue Mao, Zhengkang Ren, Yonghua Ding and the J-TEXT team, International Joint Research Laboratory of Magnetic Confinement Fusion and Plasma Physics, Huazhong University of Science and Technology</p> |
| <p>Title: Development of the gas puffing system for GPI diagnostic on the J-TEXT tokamak</p> <p>Authors: F. Li, Z. J. Yang, L. Gao, State Key Laboratory of Advanced Electromagnetic Engineering and Technology, School of Electrical and Electronic Engineering, Huazhong University of Science and Technology</p> |
| <p>Title: Construction of Pulsed Rotating Magnetic Field Ionization Platform</p> <p>Authors: Wang Lin (Institute of Fusion and Plasma Research, School of Electrical and Electronic Engineering, Huazhong University of Science and Technology), Yong Yang, Bo Rao, Yang Zhao, Ming Zhang</p> |
| <p>Title: Upgrade of Operation Mode of Bipolar Pulse Power Supply on J-TEXT</p> <p>Authors: Shiyi Peng (the International Joint Research Laboratory of Magnetic Confinement Fusion and Plasma Physics, State Key Laboratory of Advanced Electromagnetic Engineering and Technology, School of Electrical and Electronic Engineering, Huazhong University of Science and Technology), Yonghua Ding, * Bo Rao, Nengchao Wang, Mao Li and the J-TEXT team</p> |
| <p>Title: Numerical simulation of tearing mode suppression by applying non-resonant magnetic perturbations on J-TEXT</p> <p>Authors: Fan Gu (Huazhong University of Science and Technology), Zhonghe Jiang, Yunfeng Liang, Song Zhou, Zhaosu Wang, Jingyu Xiong, Jianjun Yuan and the J-TEXT team</p> |
| <p>Title: Design of a Low-Energy and High-Current-Density Ion Beam System in RF Source</p> <p>Authors: Feng Xue, Chen Zuo, Dong Li, Kaifeng Liu, Dezhi Chen, Jie Gong, State Key Laboratory of Advanced Electromagnetic Engineering and Technology, School of Electrical and Electronic Engineering, Huazhong University of Science and Technology</p> |
| <p>Title: Simulation and Experimental Analysis of Electromagnetic Pulse Spot Welding of Sheet</p> <p>Authors: Hang Zhang, Qingjian Wang, Hongfa Ding, Wuhan National High Magnetic Field Center, School of Electrical and Electronic Engineering, Huazhong University of Science and Technology</p> |
| <p>Title: Modification of operation mode of J-TEXT bipolar pulse power supply</p> <p>Authors: Shiyi Peng, Yonghua Ding, Nengchao Wang, Mao Li, International Joint Research Laboratory of Magnetic Confinement Fusion and Plasma Physics, State Key Laboratory of Advanced Electromagnetic Engineering and Technology, School of Electrical and Electronic Engineering, Huazhong University of Science and Technology</p> |
| <p>Title: A plate embossing forming method based on pulse electromagnetic force</p> <p>Authors: Qi Xiong, Lijun Zhou, Meng Yang, Xiang Zhao, Zhe Li, Xinhui Zhu, College of Electrical Engineering & New Energy, China Three Gorges University</p> |
| <p>Title: Research on The Forming Performance of Small Tube Based on Dual-Coils</p> <p>Authors: Qi Xiong, Xinhui Zhu, Meng Yang, Zhe Li, Lijun Zhou, Shengfei Li, College of Electrical Engineering & New Energy, China Three Gorges University</p> |
| <p>Title: Design a Solenoid Lens for MeV Ultrafast Electron Diffraction Device</p> <p>Authors: Zhenqiu Dong, Tao. Yang, Kuanjun. Fan, Huazhong University of Science and Technology</p> |
| <p>Title: Design of a Combined-Function Corrector for HUST FEL-THz</p> <p>Authors: Kunyue Jiang, Kuanjun Fan, State Key Laboratory of Advanced Electromagnetic Engineering and Technology, School of Electrical and Electronic Engineering, Huazhong University of Science and Technology</p> |

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