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ISGT ASIA 2019

Conference Program

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University of Electronic Science and Technology of China



国家电网
STATE GRID

May 21-24, 2019
Chengdu, China

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AGENDA

TUESDAY, MAY 21

TIME	ACTIVITY	VENUE
08:00-22:00	Registration & Conference Kits Collection	Lobby at South Wing (酒店南大堂)
09:00-12:00	Tutorials	
	Tutorial 1-“VSC HVDC and HVDC Grids” <i>Presenter: Dr. Dirk Van Hertem, University of Leuven</i>	Chamber of Mist (馨雨阁)
	Tutorial 2-“Blockchain for Smart Energy Systems” <i>Presenter: Dr. Yan Zhang, University of Oslo</i>	Chamber of Dew (浣花轩)
	Tutorial 3-“Microgrids, Current Enabling Technologies and Future Research Trends” <i>Presenter: Dr. Farhad Shahnia, Murdoch University</i>	Chamber of Dialogue (相语堂)
12:00-13:30	Lunch (for Tutorial Participants Only)	
14:30-17:30	Tutorials	
	Tutorial 4- “Modeling and Control of Voltage Source Converters for Power Quality Conditioning and Smart Microgrid” <i>Presenter: Dr. Yang Han, University of Electronic Science and Technology of China</i>	Chamber of Mist (馨雨阁)
	Tutorial 5- “Service-Dominant Logic as a Foundation for Business Model Innovation” <i>Presenter: Ebrahim Sadjadi, University of Carlos III</i>	Chamber of Dew (浣花轩)
18:00-20:00	Welcome Reception	

AGENDA

WEDNESDAY, MAY 22

WEDNESDAY, MAY 22

TIME	ACTIVITY	VENUE
08:00-22:00	Registration & Conference Kits Collection	Lobby at South Wing (酒店南大堂)
08:30-09:00	Opening Ceremony	
09:00-10:00	Keynote Session I	
	IoT Sensor Integration in an Energy Internet Platform <i>Saifur Rahman, Virginia Polytechnic Institute and State University</i>	Louvre Garden (卢浮花园)
	Arc Flash Hazard and Electrical Safety the New Revision of IEEE Std 1584 <i>Wei-Jen Lee, The University of Texas at Arlington</i>	
10:00-10:30	Coffee Break	
10:30-12:00	Keynote Session II	
	Grid Edge Synchronized Measurement and Applications <i>Yilu Liu, University of Tennessee</i>	Louvre Garden (卢浮花园)
	Learning the Unobservable: A Machine Learning Approach to High-Resolution State Estimation <i>Lang Tong, Cornell University</i>	
	Renewable Energy Based Clean Energy Systems <i>Zhe Chen, Aalborg University</i>	
12:00-13:30	Lunch	
13:30-15:30	Technical Sessions (TS01-06) & Special Sessions (SS01-02)	See Next Page
	Poster Session I	Jinjiang Hall (锦江厅)
	Mini-Symposium on Key Technologies and Applications of Cyber Energy Systems Oriented to New-Type Urbans	Four Seasons Hall-1,2 (四季 1、2 厅)
	Panel- Resilience of Power Systems and Energy Internet -I	Chengdu Hall-A (成都 A 厅)
	IEEE PES PSIM Kickoff Ceremony	Chengdu Hall-B (成都 B 厅)
15:30-16:00	Coffee Break	
16:00-18:00	Technical Sessions (TS07-12) & Special Sessions (SS03-04)	See Next Page
	Poster Session II	Jinjiang Hall (锦江厅)
	Panel- Resilience of Power Systems and Energy Internet -II	Chengdu Hall-A (成都 A 厅)
	Panel - Distributed Energy Resources, What Can Be Learned from Experience of Australia and China	Chengdu Hall-B (成都 B 厅)
18:00-20:00	Dinner	

Technical Sessions

13:30-15:30 | WEDNESDAY, MAY 22

Session #	Session Title	Venue
TS01	Grid Operation and Management- I	Chamber of Mist (馨雨阁)
TS02	Grid Operation and Management-II	Chamber of Dew (浣花轩)
TS03	Emerging Technologies and End-user Systems-I	Chamber of Dialogue (相语堂)
TS04	Grid Operation and Management-III	Chamber of Peony (牡丹亭)
TS05	Power Electronics and Control and Protection systems for Smart Grids-I	Chamber of Blossom (梅兰阁)
TS06	Renewable Generation and Distributed Energy Resources Integration-I	Chamber of Lotus (芙蓉居)

16:00-18:00 | WEDNESDAY, MAY 22

TS07	Computational Intelligence Applications, Information and Communication Technologies (ICT), and Cyber-Security-I	Chamber of Mist (馨雨阁)
TS08	Grid Operation and Management -IV	Chamber of Dew (浣花轩)
TS09	Emerging Technologies and End-user Systems-II	Chamber of Dialogue (相语堂)
TS10	Grid Operation and Management -V	Chamber of Peony (牡丹亭)
TS11	Power Electronics and Control and Protection systems for Smart Grids-II	Chamber of Blossom (梅兰阁)
TS12	Renewable Generation and Distributed Energy Resources Integration-II	Chamber of Lotus (芙蓉居)

Special Sessions

13:30-15:30 | WEDNESDAY, MAY 22

Session #	Session Title	Venue
SS01	Smart Grid Resiliency	Brocade City Hall-1,2 (锦城 1、2 厅)
SS02	Machine Learning and its applications to Power Systems-I	Four Seasons Hall-3,4 (四季 3、4 厅)

16:00-18:00 | WEDNESDAY, MAY 22

SS03	Planning, Operation and Control Techniques for Integrated Systems with Distributed Photovoltaic and Cascaded Small-Hydropower Stations	Brocade City Hall-1,2 (锦城 1、2 厅)
SS04	Machine Learning and its applications to Power Systems-II	Four Seasons Hall-3,4 (四季 3、4 厅)

WEDNESDAY, MAY 22

Keynote Session I

Chaired by Weihao Hu



Saifur Rahman

IEEE Life Fellow
President of the IEEE Power and Energy Society
Founding Director of the Advanced Research Institute
Virginia Polytechnic Institute and State University

Speech title: IoT Sensor Integration in an Energy Internet Platform

Abstract: Internet of Things (IoT) deployments offer a much higher value proposition if these can function in the context of smart buildings. Such advanced information and communication technology (ICT) applications in commercial buildings, schools, libraries, shopping centers, etc. offer low cost but highly effective monitoring and control opportunities. Sensors deployed in key locations can monitor the building environment in real-time, collect information for intelligent decision making, and facilitate various services. An IoT sensor platform has been developed that provides a unified communication platform which can integrate information from disparate sources and provide one control hierarchy. It is a powerful, low-cost, open-architecture software platform that can monitor and control major electrical loads (e.g., HVAC, lighting and plug loads), as well as solar PV systems, energy storage units and other IoT sensors in commercial buildings. The platform can provide new or legacy buildings with a building automation system (BAS) or connect with existing BAS systems in large and small commercial buildings. This platform leverages machine learning algorithms to draw insights from a deployed building's historical operating data and occupant preferences to save energy (kWh) while increasing occupant comfort. This also allows buildings to reduce peak demand (kW) through direct communication with utilities using demand response protocols such as openADR.

BIO: Professor Saifur Rahman is the founding director of the Advanced Research Institute (www.ari.vt.edu) at Virginia Tech, USA where he is the Joseph R. Loring professor of electrical and computer engineering. He also directs the Center for Energy and the Global Environment (www.ceage.vt.edu). He is a Life Fellow of the IEEE and an IEEE Millennium Medal winner. He is the president of the IEEE Power and Energy Society (PES) for 2018 and 2019. He was the founding editor-in-chief of the IEEE Electrification Magazine and the IEEE Transactions on Sustainable Energy. He has published over 140 journal papers and has made over four hundred conference and invited presentations. In 2006 he served on the IEEE Board of Directors as the vice president for publications. He is a distinguished lecturer for the IEEE Power & Energy Society and has lectured on renewable energy, energy efficiency, smart grid, electric power system operation and planning, etc. in over 30 countries. He is the founder of BEM Controls, LLC, a Virginia (USA)-based software company providing building energy management solutions. He served as the chair of the US National Science Foundation Advisory Committee for International Science and Engineering from 2010 to 2013. He has conducted several energy efficiency related projects for Duke Energy, Tokyo Electric Power Company, the US Department of Defense, the State of Virginia and the US Department of Energy.

WEDNESDAY, MAY 22

Keynote Session I

Chaired by Weihao Hu



Wei-Jen Lee

IEEE Fellow
President-Elect of the IEEE Industry Application Society
IEEE IAS Distinguished Lecturer
Director and Professor Energy Systems Research Center
The University of Texas at Arlington

Speech Title: Arc Flash Hazard and Electrical Safety the New Revision of IEEE Std 1584

Abstract: Though electrical incidents represent a relatively small percentage of all work-related incidents, they are disproportionately fatal. In the case of burn injury, it may result in extended hospitalization and rehabilitation. According to NFPA 70E, approximately 5 to 10 arc flash explosions occur on the job every day in the United States. Proper protection is the key to reduce casualties during these incidents. IEEE 1584 and NFPA 70E are developed to protect the safety of the workers. With the better understanding of the arc flash phenomena, several areas in the IEEE Std. 1584-2002 need further research, testing validation, and revision.

The IEEE and the NFPA (National Fire Protection Association) have joined forces on an initiative to fund and support research and testing to improve the understanding of arc flashes. The results of this collaborative project will provide information that will be used to improve electrical safety standards, predict the hazards associated with arcing faults and accompanying arc blasts, and provide practical safeguards for employees in the workplace. The identified areas include but are not limited to: 1) Heat and Thermal Effects, 2) Blast Pressure, 3) Sound, and 4) Light intensity.

This presentation will cover the basic understanding of the arc flash, performing the arcing current and incident energy calculation, and the procedures that have been carried out to provide information for the updating and clarifications of IEEE Std. 1584 – 2018 arc flash standards.

BIO: Professor Lee received the B.S. and M.S. degrees from National Taiwan University, 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 dot 3000 series development. He is the President Elect of the IEEE Industry Application Society (IAS). He is an editor of IEEE Transactions on Industry Applications and IAS Magazine and editorial board member of Journal of Modern Power Systems and Clean Energy (MPCE) and CSEE Journal of Power and Energy Systems. 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, smart grid, microgrid, energy internet and virtual power plants (VPP), arc flash hazards and electrical safety, load and wind capacity forecasting, power quality, distribution automation and demand side management, power systems analysis, online 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\$16 million dollars. He has published more than one hundred and fifty journal papers and two hundred seventy conference proceedings. He has provided on-site training courses for power engineers in Panama, China, 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.

Keynote Session II

Chaired by Dean Sharafi



Yilu Liu

Member of National Academy of Engineering
IEEE Fellow
Governor's Chair Professor of ORNL/UTK
Deputy Director of CURENT
University of Tennessee

Speech Title: Grid Edge Synchronized Measurement and Applications

Abstract: The talk will introduce the research of power grid wide-area monitoring and some fascinating observations that were made possible from the grid edge synchronized data. The critical roles of wide-area phasor measurement in situation awareness, operation, and control will be discussed. The concept of electromechanical wave propagation in power grid will be demonstrated using measurement data collected from the actual grids. Applications of time synchronized data in event location, oscillation detection, model validation, and others will be discussed.

BIO: Yilu Liu received her M.S. and Ph.D. degrees from the Ohio State University, Columbus, in 1986 and 1989. She received the B.S. degree from Xian Jiaotong University, China.

Dr. Liu is currently the UT-ORNL Governor's Chair at the University of Tennessee, Knoxville and Oak Ridge National Laboratory (ORNL). She is also the deputy director of the DOE/NSF engineering research center CURENT (curent.utk.edu). She led the effort to create the North American power grid Frequency Monitoring Network FNET/GridEye (fnetpublic.utk.edu, powerit.utk.edu). Dr. Liu is an expert in large grid dynamic modeling and simulations.

Dr. Liu is a member of National Academy of Engineering, a member of the National Academy of inventors, a fellow of IEEE.

WEDNESDAY, MAY 22

Keynote Session II

Chaired by Dean Sharafi



Lang Tong

IEEE Fellow
IEEE SPS Distinguished Lecturer
2018 Fulbright Distinguished Chair in Alternative Energy
Cornell University

Speech Title: Learning the unobservable: a machine learning approach to high-resolution state estimation

Abstract: We present a machine learning approach to power system state estimation when there are limited sensor measurements such that the system is unobservable. An observable system may become unobservable when sensors are at fault, sensor data missing, or data tempered by malicious agents. Specific applications include state estimation in distribution systems when there are few fast timescale sensors deployed in the system and high-resolution state estimation in the transmission systems using only limited phasor measurement units. For these applications, deep learning technology offers promising solutions in achieving optimal state estimation with significantly lower computation cost.

BIO: Lang Tong joined Cornell University in 1998 where he is now the Irwin and Joan Jacobs Professor in Engineering and the Cornell site director of the Power Systems Engineering Research Center (PSERC). His current research focuses on optimization, machine learning, and market operations of smart grid and future energy systems. A Fellow of IEEE, a distinguished lecturer of the IEEE Signal Processing Society, and the 2018 Fulbright Distinguished Chair in Alternative Energy, Professor Tong has made contributions in multiple technical fields in electrical engineering, including signal processing, communications, networking, and power systems, for which he received best paper awards from the IEEE Signal Processing, Communications, and Power and Energy societies, and his students received seven student paper awards.

Keynote Session II

Chaired by Dean Sharafi



Zhe Chen

IEEE Fellow
Leader of Wind Power Research Program
Aalborg University

Speech Title: Renewable Energy Based Clean Energy Systems

Abstract: Many nations have set long-term energy targets to develop renewable energy technology to provide sustainable and clean energy, to reduce the use of fossil fuel, to improve environment and life quality. The energy sector is facing the challenges to providing reliable, flexible, and price-competitive energy services to communities. With the development and deployment of innovative, sustainable low-carbon energy technologies, the interdependence of different energy carriers, such as power, gas and heat, and information technology have been continuously increased, many new features are emerging. This presentation will describe renewable energy technology developments, integration of multi energy systems, as well as some challenges in power systems.

BIO: Zhe Chen received the B.Eng. and M.Sc. degrees in Electrical Engineering from Northeast China Institute of Electric Power Engineering, China, in 1982, 1986 respectively, the Ph.D. degree in Power and Control, from University of Durham, England, in 1997.

Dr Chen has been a Professor with the Department of Energy Technology, Aalborg University, Denmark since 2002. He is the Danish Principle Investigator for Wind Energy of Sino-Danish Centre for Education and Research (SDC). The leader of Wind Power System Research program at the Department of Energy Technology, Aalborg University. Professor Chen's main current research interests are wind energy and modern energy systems. He has led and participated many international and national research projects. He is a Fellow of IEEE, a Fellow of IET (London, U.K.) and a Chartered Engineer in the U.K.

WEDNESDAY, MAY 22

Technical Sessions

13:30-15:30 | WEDNESDAY, MAY 22

TS01- Grid Operation and Management- I
 Session Chair: Xiaorong Xie, Tsinghua University
 Venue: Chamber of Mist (馨雨阁)

Time	Paper ID	Title & Authors
13:30~13:45	10	Reliability analysis of centralized protection system considering the impact of messages under multi-operating states <i>Yong Chen, Shengnan Li, Li Zhang, Bingcheng Liu, Hao Lu and Zhihui Dai</i> North China Electric Power University, China
13:45~14:00	142	Regional Power Grid AGC Control Strategy Research Based on Q-Learning Algorithm Under WACPB Mode <i>Xiangyu Zhao, Gang Yao, Nianjie Tian, Jiang Dai and Huaying Su</i> Guizhou Power Grid Dispatch Center, China
14:00~14:15	840	Wide-band Phasor Measurement Unit: Design and Test <i>Chen Wu, Jie Sheng, Guangying Cheng, Ronghua Duan, Min Cheng, Xiaorong Xie and Zhixue Li</i> Tsinghua University, China
14:15~14:30	60	Division of working variable domain fuzzy PID control for valley electric phase change heat storage <i>Yu Hongxia, Yang Chengxiang and Zhao Qingqi</i> Shenyang Economic and Technological Development Zone, China
14:30~14:45	116	The Study on the Load Characteristics of the Induction Motor with Converter and their Influence on Under Voltage Load Shedding <i>Nan Li, Xiaonan Yang, Feng Han, Yuxiang Li, Yunxu Hu and Yiping Yu</i> Hohai University, China
14:45~15:00	123	Transformer Over Passivation to Prevent On-Load Tap Changer Silver Sulphide Corrosion <i>Sameera Samarasinghe, Daniel Martin and Hui Ma</i> The University of Queensland, Australia
15:00~15:15	15	Dynamic Performance of a High Accuracy Generator Model for Stability Analysis <i>Quincy Wang, Renke Huang, Song Wang, Ruisheng Diao and Yilu Liu</i> University of Tenn and Oak Ridge Nat Lab, United States

TS02- Grid Operation and Management-II
 Session Chair: Yufei Teng, State Grid Sichuan Electric Power Research Institute
 Venue: Chamber of Dew (浣花轩)

Time	Paper ID	Title & Authors
13:30~13:45	155	Reactive Power Provision for Voltage Support Activating Flexibility of Active Distribution Networks via a TSO-DSO Interactive Mechanism <i>Kunjie Tang, Rui Fang, Li Wang, Junge Li, Shufeng Dong and Yonghua Song</i> Zhejiang University, China
13:45~14:00	169	An Out-of-step Splitting Strategy Based on WAMS Information for Oscillation Center Migration under Multi-Operation Mode <i>Hangpeng Ni, Tao Lin, Ruyu Bi and Shuitian Li</i> Wuhan University, China

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14:00~14:15	171	Static Security Assessment of Power System Considering Governor Nonlinearity <i>Chengwei Fan, Zhen Chen, Xiaoru Wang, Yufei Teng, Gang Chen, Hua Zhang and Xiaoyan Han</i> Sichuan Electric Power Research Institute, China
14:15~14:30	180	Fault Line Selection of Single Phase Grounding Fault in Small-Current Ground System Based on Reactive Current <i>Shilong Li, Yufei Teng, Xiaopeng Li, Huajie Zhang and Shilin Feng</i> State Grid Sichuan Electric Power Research Institute, China
14:30~14:45	187	A Transmission System Planning Method Considering Risk Volatility and Capability of Accommodating Wind Power <i>Sun Bo, Yan Jubin and Yang Yuxuan</i> Chengdu Chengdian Electric Power Engineering Design Co. Ltd, China
14:45~15:00	190	Supraharmonics measurement algorithm based on CS-SAMP <i>Yang Xinggang, Pan Aiqiang, Yu Guangzheng and Li Chenyang</i> Shanghai University of Electric Power, China
15:00~15:15	191	Impact of the UHVDC on Performance Characteristics of Power Grid <i>Qiushi Xu, Xu Zheng, Aihong Tang, Shuyuan Zhang and Dechao Xu</i> Wuhan University of Technology, China
15:15~15:30	274	Research on Power Capacitor Insulation State Detection Based on Polarization Depolarization Current Method <i>Chenmeng Zhang, Xin Wang, Siwen Tan and Shuping Cao</i> State Grid Sichuan Electric Power Research Institute, China

TS03- Emerging Technologies and End-user Systems-I

Session Chair: Jinghua Li, Guangxi University

Venue: Chamber of Dialogue (相语堂)

Time	Paper ID	Title & Authors
13:30~13:45	24	Multiple Loads-Single Smart Meter for Measurement and Control of Smart Grid <i>Brandon England and Ali Alouani</i> Tennessee Tech, United States
13:45~14:00	58	Optimal Operation of Hybrid AC/DC Distribution Network Based on Two-Stage Robust Optimization Model and Corrective Control <i>Yang Fu, Zhiquan Zhang, Zhenkun Li and Xiaolin Ge</i> Shanghai Maritime University, China
14:00~14:15	111	Operational Benefits Assessment of Demand Response Based on Linearized Consumers Satisfaction Constraints and Stochastic Simulation Method <i>Min Zhang, Xiaoyu Cao and Jianxue Wang</i> Xi'an Jiaotong University, China
14:15~14:30	125	Optimal Operation of AC/DC Hybrid Micro Grid Considering Night Energy Storage Constraints <i>Linjun Shi, Wei Wei, Haoqing Zhu, Xiaodong Yuan, Juntao Fei and Kejun Qian</i> Hohai University, China
14:30~14:45	160	Temporal and Spatial Pricing for Optimal Electric Vehicle Charging and Discharging Management <i>Xianzhong Dai, Yufeng Chai, Xinyang Han, Xiangpeng Zhan and Jun Yang</i> State Grid Energy Research Institute, China
14:45~15:00	177	Impact of Time-Shiftable Traffic Demands on Coupled Transportation and Power Distribution Systems <i>Longxian Hu, Wei Wei and Ziqi Shen</i> Tsinghua University, China

15:00~15:15	183	A Two Stage AC-DC Converter for Speed Control of a DC Motor <i>Anupam Dixit</i> The University of Queensland, Australia
15:15~15:30	197	Improved Droop Control Strategy for Reactive Power Sharing of Parallel Inverters In Low-Voltage Microgrid <i>Xiaodan Bai, Hong Miao and Chengbi Zeng</i> Sichuan University, China

TS04- Grid Operation and Management-III
Session Chair: Min Sun, University of Electronic Science and Technology of China
Venue: Chamber of Peony (牡丹亭)

Time	Paper ID	Title & Authors
13:30~13:45	36	Unreasonable reactive power flow of traditional SVC and a novel SVC model against it <i>Huaichang Ge, Tianhua Chen, Hao Chen, Haoyin Ding, Qinglai Guo, Bin Wang and Fengda Xu</i> Tsinghua University, China
13:45~14:00	40	Life Cycle Cost Analysis of Distribution Transformers Considering High Overload Capacity and Vegetable Insulating Oil <i>Lin Gan, Wenxiong Mo, Jian Fang, Jian Jiang, Yi Rao, Yu Tan and Hang Zhang</i> China Southern Power Grid Guangzhou Power Supply Bureau Co. Ltd, China
14:00~14:15	42	Multi-machine Power System Stabilizers Optimal Design Considering Multiple Operating Modes <i>Jianbo Yi, Guozhou Zhang, Qi Huang, Yufei Teng and Peng Zhang</i> University of Electronic Science and Technology of China, China
14:15~14:30	54	Dynamic State Estimation of Distribution Network Base on Pseudo Measurement Modeling and UPF <i>Biyun Chen, Hongbin Li and Xiangyang Su</i> Guangxi University, China
14:30~14:45	129	Research on Intelligent and Auxiliary Formulating Dispatching Plan Method for Large-scale Power Grids <i>Min Zhao, Fang Tian and Ping Ding</i> China Electric Power Research Institute, China
14:45~15:00	136	Probabilistic Load Forecasting via Point Forecast Feature Integration <i>Qicheng Chang, Yishen Wang, Xiao Lu, Di Shi, Haifeng Li, Jiajun Duan, Zhiwei Wang</i> GEIRI North America, United States
15:00~15:15	158	Optimal Power Flow Calculation of Combined Electricity-Heat Power System Based on Alternating Direction Method of Multipliers <i>Wei Du, Zhihong Yang, Junjie Ligao, Guoxin He, Xiaochen Zhang and Jun Yang</i> Wuhan University, China
15:15~15:30	174	Similarity Calculation Considering the Impact of Voltage Regulation <i>Zeyang Tang, Defu Cai, Wenna Wang, Yan Liu, Fei Yu, Dan Qiu, Kan Cao, Xin Shu, Bingke Yan, Li Wan, Xiaodong Yu and Kunpeng Zhou</i> Electric Power Research Institute State Grid Hubei Electric Power Co., Ltd, China

TS05- Power Electronics and Control and Protection systems for Smart Grids-I

Session Chair: Jinrui Tang, Wuhan University of Technology

Venue: Chamber of Blossom (梅兰阁)

Time	Paper ID	Title & Authors
13:30~13:45	81	A strategy for suppressing the second harmonic of output power for photovoltaic grid-connected inverters with low voltage ride-through <i>Haitao Yang, Huifen Zhang, Xijing Wang and Xibin Zhao</i> University of Jinan, China
13:45~14:00	87	Fault Detection of High Voltage Circuit Breaker Based on Moving Window Variational Mode Decomposition and Fuzzy Entropy <i>Junxiang Liu, Le Luan, Hongbin Wang, Heping Peng and Haijing Wang</i> Test and Research Institute of Power Supply Bureau, Guangzhou Power Grid, China
14:00~14:15	91	Simulation of Electrical Stresses on DC Cable system in a ± 800 kV LCC-UHVDC Transmission System <i>Haitian Wang and Mingyu Zhou</i> Global Energy Interconnection Research Institute Europe GmbH, Germany
14:15~14:30	161	A novel zero-residual-current arc suppression method using single-phase voltage source inverter <i>Hongbo Yang, Jinrui Tang, Hui Hou, Xixiu Wu and Xinhao Bian</i> Wuhan University of Technology, China
14:30~14:45	179	Fault Analysis of DC-Transformer for DC Distribution grid <i>Pu Lin, Zhaoyun Zhang, Shuquan Chen, Zhi Zhang and Xinghua Wang</i> Dongguan University of Technology, China
14:45~15:00	202	Modeling of LCC-HVDC Stations Based on Concept of Motion Equation <i>Jun Lu, Xiaoming Yuan, Jiabing Hu, Meiqing Zhang and Hao Yuan</i> Huazhong University of Science and Technology, China
15:00~15:15	208	Unbalanced Loads Control Strategy for Virtual Synchronous Generator in passive network <i>Xichun Wu, Jun Mei, Bingbing Wang, Liang Dong, Chaoyun Qin and Zong Jin</i> Southeast University, China

TS06- Renewable Generation and Distributed Energy Resources Integration-I

Session Chair: Tao Ding, Xi'an Jiaotong University

Venue: Chamber of Lotus (芙蓉居)

Time	Paper ID	Title & Authors
13:30~13:45	27	Impact of FRT Control Strategies of Photovoltaic Power Generation System on Short-Term Dynamic Voltage Response <i>Gelma Boneya Huka, Pupu Chao and Weixing Li</i> Harbin Institute of Technology, China
13:45~14:00	45	Simplified modeling of Directly Driven Wind Turbine with Permanent Magnet Synchronous Generator based on PSASP/UD <i>Kang Ju, Weiguo He, Feng Wu, Linjun Shi, Hongyang Huang, Wen Hua, Guanghui Hua</i> Hohai University, China
14:00~14:15	53	Fault Analysis for Three Phase Unbalanced Distribution Network with Photovoltaic Generation Integration <i>Huan Li, Ke Peng and Xinhui Zhang</i> Shandong University of Technology, China

14:15~14:30	62	Combined Tree Growth Algorithm for Optimal Location and Size of Multiple DGs with Different Types in Distribution Systems <i>Mansur Khasanov, Kaigui Xie, Salah Kamel, Lili Wen and Xuan Fan</i> Chongqing University, China
14:30~14:45	126	Different Impacts of Positive Error and Negative Error of Wind Power Forecasting on Power System Economical Operation <i>Chen Yu, Kang Chang, Yanfang Zhu, Yanhong Ma, Xiuli Zhang and Xiaohu Yang</i> NARI Group Corporation (SGEPRI), China
14:45~15:00	139	Peaking Compensation Mechanism for Supply and Demand Sides Union Promoting Wind Power Integration <i>Jianfeng Sha, Hao Liu, Hui Feng Dong, Tianliang Wang and Xin Jiang</i> Zhengzhou University, China
15:00~15:15	69	Multi-Objective Whale Optimization Algorithm for Optimal Integration of Multiple DGs into Distribution Systems <i>Salah Kamel, Ali Selim, Francisco Jurado, Juan Yu, Kaigui Xie and Changqing Yu</i> Chongqing University, China
15:15~15:30	992	Operational Optimization of Wind Farm Integrated Battery/Electrolyzer in Electricity Market Considering Fluctuation Penalty <i>Xiao Xu, Weihao Hu, Di Cao, Qi Huang and Zhe Chen</i> University of Electronic Science and Technology of China

Technical Sessions

16:00-18:00 | WEDNESDAY, MAY 22

TS07- Computational Intelligence Applications, Information and Communication Technologies (ICT), and Cyber-Security -I

Session Chair: Jian Li, University of Electronic Science and Technology of China

Venue: Chamber of Mist (馨雨阁)

Time	Paper ID	Title & Authors
16:00~16:15	163	Research and Implementation of Electric-Communication Joint Teaching Platform Based on the IEC-103 Protocol <i>Xinhao Bian, Jinrui Tang, Hui Hou, Xixiu Wu and Hongbo Yang</i> Wuhan University of Technology, China
16:15~16:30	204	Cloud-Supported Internet of Things Data Security and Access Control in Smart Grid <i>Yalian Wu, Chengcheng Wu and Jian Hou</i> Xiangtan University, China
16:30~16:45	233	Research of Typical Line Loss Rate in Transformer District Based on Data-Driven Platform <i>Bo Xu, Liming Wang, Yong Zhao, Shubo Liu, Xinran Li, Jinran Wang, Ling Liu and Guoqiang Sun</i> Hohai University, China
16:45~17:00	336	A Fault Pattern and Convolutional Neural Network Based Single-phase Earth Fault Identification Method for Distribution Network <i>Yajie Li, Yu Zhang, Wenjing Liu, Zhenning Chen, Yonghui Li and Jun Yang</i> Wuhan University, China

17:00~17:15	350	Study on short-term load forecasting method considering meteorological factors of offshore oil field group microgrid <i>Wenting Tan, Anan Zhang, Yating Feng, Yangfan Sun, Huang Huang and Siyuan Wang</i> Southwest Petroleum University, China
17:15~17:30	372	A Novel Key-value based Real-time Data Management Framework for Ship Integrated Power Cyber-Physical System <i>Chengya Shang, Xianqiang Bao, Lijun Fu, Li Xia, Xinghua Xu and Chengcheng Xu</i> University of Naval Engineering, China
17:30~17:45	375	Linearization Error of Power Flow Model Considering the Distribution of State Variables <i>Nan Feng, Zhifang Yang, Zhixin Fan, Juan Yu and Gaofeng Yang</i> Chongqing University, China
17:45~18:00	410	Line Loss Association and Prediction Model Based on Deep Learning <i>Daiyu Deng, Jian Li, Weihao Hu, Qi Huang, Shuwen Xu and Dechao Xu</i> UESTC, China

TS08- Grid Operation and Management -IV

Session Chair: Min Sun, University of Electronic Science and Technology of China

Venue: Chamber of Dew (浣花轩)

Time	Paper ID	Title & Authors
16:00~16:15	561	Influence of Generator-tripping Time on Transient Stability <i>Yusheng Xue, Xueqiong Zhu and Ze Li</i> Southeast University, China
16:15~16:30	563	Load Flow Analysis of 132/11 KV Grid Station Bahawalpur region Pakistan and its Voltage Improvement through FACTS Devices using ETAP <i>Abubakar Siddique, Yonghai Xu, Waseem Aslam, Muhammad Hanan, Adnan Azhar and Hafiz Mudassir Munir</i> North China Electric Power University, , China
16:30~16:45	573	Advanced method for the insertion time of the closing resistor based on the pre-breakdown characteristics <i>Wei Wei, Ying Liu, Shengwei Mei, Fan Tang, Lijie Ding, Shumin Miao and Lun Tang</i> State Grid Sichuan Electric Power Research Institute, China
16:45~17:00	574	Study on Residual Flux Evaluation Method Based on Variable-Regional Integral during the Voltage Attenuation Process <i>Wei Wei, Ying Liu, Shengwei Mei, Fan Tang, Lijie Ding, Lun Tang and Shumin Miao</i> State Grid Sichuan Electric Power Research Institute, China
17:00~17:15	983	Analysis on Oscillation Propagation Characteristics based on Impedance Model <i>Yan Gong, Qi Huang, Jian Li, Dongsheng Cai and Yue Ma</i> University of Electronic Science and Technology of China, China
17:15~17:30	1002	Prediction for the Maximum Frequency Deviation of Post-disturbance Based on the Deep Belief Network <i>Yichao Zhang, Hongyu Zhu and Xiaoru Wang</i> Southwest Jiaotong University, China
17:30~17:45	792	On Multiobjective Optimization of Switch Allocation in Radial Distribution Networks <i>Zbigniew Galias</i> AGH University of Science and Technology

TS09-Emerging Technologies and End-user Systems-II
Session Chair: Yang Han, University of Electronic Science and Technology of China
Venue: Chamber of Dialogue (相语堂)

WEDNESDAY, MAY 22

Time	Paper ID	Title & Authors
16:00~16:15	313	Cooperative Energy Management for Enterprise Microgrid Using Electrical Energy Router <i>Shiqing Jiao, Yong Li, Sijia Hu, Yu Zhang, Xiaohui Song, Li He and Jingrong Shi</i> Hunan University, China
16:15~16:30	330	Impacts of Zero Net Energy Buildings on Customer Energy Savings and Distribution System Planning <i>Ming Liang, Jiyu Wang, Yao Meng, Ning Lu, David Lubkeman and Andrew Kling</i> North Carolina State University, United States
16:30~16:45	331	Reliability Evaluation of Voltage Source Converters for MVDC Applications <i>Gayan Abeynayake, Gen Li, Tibin Joseph, Wenlong Ming, Jun Liang, Andrew Moon, Kevin Smith and James Yu</i> Cardiff University, United Kingdom
16:45~17:00	343	Optimal Scheduling of Integrated Energy Systems Considering Multi-Energy Flow Constraints <i>Dawei Chen, Can Wan, Shufeng Dong and Yonghua Song</i> Zhejiang University, China
17:00~17:15	345	A Novel Optimal Operation of Integrated Electrical and Heating System with Photovoltaic and Solar Thermal System <i>Yuchen Song, Weihao Hu, Xiao Xu, Qi Huang and Zhe Chen</i> University of Electronic Science and Technology of China, China
17:15~17:30	395	Oriented Electric Vehicles and DC Charging Piles Feasibility Analysis of Power Line Communication Based on OFDM <i>Liang Zhang, Shengbin Chi, Kang Chen, Ling Lyu and Huanhuan Ma</i> Northeast Electric Power University, China
17:30~17:45	404	A optimal algorithm for DC breakers configuration in multi-terminal DC systems <i>Shengjie Hu and Yuhong Wang</i> Sichuan University, China
17:45~18:00	408	Low Complexity Non-Intrusive Load Disaggregation of Air Conditioning Unit and Electric Vehicle Charging <i>Attique Ur Rehman, Tek Tjing Lie, Brice Vallès and Shafiqur R. Tito</i> Auckland University of Technology, New Zealand

TS10- Grid Operation and Management -V
Session Chair: Tao Jin, Fuzhou University
Venue: Chamber of Peony (牡丹亭)

Time	Paper ID	Title & Authors
16:00~16:15	193	Loss Comparison Study of MMC-HVDC and All-DC Offshore Wind farm <i>Weijia Tang, Mingming Shi, Zhen Li and Nayan Yu</i> State Grid Jiangsu Electric Power Co., LTD. Research Institute, China
16:15~16:30	195	Research on Power Supply Recovery Scheme Based on Distributed Intelligence <i>Jun Ying, Mingxiang Liu, Yalou Chen, You Yue, Wenlu Ji and Ming Zhang</i> NARI Group Co. Ltd. (State Grid Electric Power Research Institute), China

16:30~16:45	214	Power Transmission Network Expansion Planning Research Considering System Weak Connection Recognition <i>Chufei Xiao, Fei Tang and Dichen Liu</i> Wuhan University, China
16:45~17:00	230	Global Voltage Sensitivity Calculation for power system including transmission and distribution networks <i>Jierui Yang, Yujie Sun, Guopeng Liu, Xinhui Cui, Chengbin Wang and Kaigang Ma</i> School of Electrical Engineering, Shandong University, China
17:00~17:15	254	Optimal Power Flow in Hybrid AC and Multi-terminal HVDC Networks with Offshore Wind Farm Integration Based on Semidefinite Programming <i>Yuhao Zhou, Long Zhao, Wei-Jen Lee, Zhenyuan Zhang and Peng Wang</i> University of Electronic Science and Technology of China, China
17:15~17:30	259	Optimal Allocation Method of Dynamic Reactive Power Compensation to Suppress Simultaneous Commutation Failure of Multiple DC Lines <i>Wen Jian, Fei Tang and Chufei Xiao</i> Wuhan University, China
17:30~17:45	264	An MILP Model for Annual Electric Power Balance Based on Monthly Multi-typical Daily Load Scenarios <i>Suituo Shao, Wei Yan, Yang Liu and Yingming Mao</i> Chongqing University, China
17:45~18:00	269	Data-driven Localization of Forced Oscillations in Power Systems <i>Wenqing Li, Tong Huang, Nikolaos Freris, P. R. Kumar and Le Xie</i> University of Science and Technology of China, China

TS11- Power Electronics and Control and Protection systems for Smart Grids-II
Session Chair: Pengfei Hu, University of Electronic Science and Technology of China
Venue: Chamber of Blossom (梅兰阁)

Time	Paper ID	Title & Authors
16:00~16:15	229	Numerical Stability and Compensation Method for Equivalent Controlled Source in Electromagnetic Transient Simulation <i>Lu Gao, Feng Ji, Heming Yan, Chang Lin, Hui Pang and Jihong Li</i> Global Energy Interconnection Research Institute, China
16:15~16:30	281	Current Amplitude Ratio Based Pilot Protection for the transmission Line Connected to Inverter-interfaced Renewable Energy Power Plants <i>Ke Jia, Zhe Yang, Zhengxuan Zhu, Qijuan Zhao, Yu Fang and Bohan Liu</i> North China Electric Power University, China
16:30~16:45	290	Application of Current-transferring Submodule in Modular Multilevel Converter <i>Mengxue He, Jun Mei, Guangyao Fan, Rui Ge, Chaoyun Qin, Dong Liang and Jin Zong</i> Southeast University, China
16:45~17:00	301	Configuration and Control of Energy Router for Classification and Consumption of Wind Power <i>Jinhao Hu and Jilai Yu</i> Harbin Institute of Technology, China
17:00~17:15	315	Electric spring control based on intelligent controller and cascade second-order generalized integrator phase locked loop <i>Yuqi Zheng, Jun Long and Haoyan Yang</i> Guangxi University, China

17:15~17:30	365	Parameter Optimization Method of MMC Controls Based on Firefly Algorithm <i>Tianxiao Huang, Tianzhi Cao, Ziqiang Ran, Binghui Wang and Qing Liu</i> State Grid Jibei Power Company, China
17:30~17:45	370	Multi-Phase Permanent Magnet Synchronous Generator Variable Speed Constant Frequency Offshore Wind System Based on Modular Multilevel Converter <i>Yao Gang, Gao Yichang, Zhou Lidan, Li Dongdong and Li Xing</i> SJTU, China
17:45~18:00	885	Active Frequency Support Control of Energy Storage Power Station Based on Photovoltaic and Energy-storage Microgrid <i>Ting Yang, Hongfen Cui, Liang Zhang, Bo Yang, Guanjun Li and Yongcan Lu</i> Nanjing Institute of Technology, China

TS12- Renewable Generation and Distributed Energy Resources Integration-II

Session Chair: Weihao Hu, University of Electronic Science and Technology of China

Venue: Chamber of Lotus (芙蓉居)

Time	Paper ID	Title & Authors
16:00~16:15	63	Allocation of Distributed Generation in Radial Distribution Networks Using an Efficient Hybrid Optimization Algorithm <i>Mansur Khasanov, Salah Kamel, Kaigui Xie, Ping Zhou and Bo Li</i> Chongqing University, China
16:15~16:30	293	Robust Voltage Security Region with VSC-HVDC Connections <i>Tao Niu, Feng Jiang, Qinglai Guo, Zheng Wang, Huaichang Ge, Hongyang Jin, Bin Wang</i> Tsinghua University, China
16:30~16:45	152	A Multi Objective Framework for Optimal Installation of Distributed Generator Units Using Genetic Algorithm <i>Arputha Aravinth, Vikas Anand Vatul and Narayanan K</i> Sastra Deemed University, India
16:45~17:00	168	Stochastic Planning Model for Incremental Distribution Network Considering CVaR and Wind Power Penetration <i>Xijun Ren, Na Yang, Bin Ye, Yunting Yao and Ciwei Gao</i> Southeast University, China
17:00~17:15	258	Fault Model of Inverter Interfaced Distributed Generator Adopting PQ Control Strategy Considering Current Tracking Capability of Converter <i>Chuanzhi Wei, Xiaohan Shi, Boxi Zhou and Yang Liu</i> Shandong University, China
17:15~17:30	279	Inertial Response of Doubly-fed Induction Generator with the Phase-locked Loop <i>Mengqi Qing and Fei Tang</i> Wuhan University, China
17:30~17:45	291	Critical Bus Voltage Support in Islanded Microgrids with Consensus Algorithm of Distributed Generators <i>Ernauli Aprilia, Wang Zhang, Ke Meng and Zhao Yang Dong</i> University of New South Wales, Australia
17:45~18:00	68	Capacitor Allocation in Distribution Systems Using Fuzzy Loss Sensitivity Factor with Sine Cosine Algorithm <i>Salah Kamel, Ali Selim, Francisco Jurado, Juan Yu, Kaigui Xie and Tao Wu</i> Chongqing University, China

Special Sessions

13:30-15:30 | WEDNESDAY, MAY 22

SS01- Smart Grid Resiliency

Session Chairs: Dhivya Sampath Kumar, National University of Singapore

Anurag Sharma, Newcastle University

Kailun Zhang, State Grid Chengdu Electric Power Supply Company

Venue: Brocade City Hall-1,2 (锦城 1、2 厅)

WEDNESDAY, MAY 22

Time	Paper ID	Title & Authors
13:30~13:45	184	Planning of Distributed Energy Resources in Singapore <i>Dhivya Sampath Kumar, Hamimah Binte Ahmad Jefria, Anurag Sharma, Wai Lok Woo</i> National University of Singapore, Singapore
13:45~14:00	185	Study of Smart Condition Monitoring using Deep Neural Networks with Dropouts and Cross-Validation <i>Hwee Fang Cindy Tan, Wai Lok Woo, Anurag Sharma, Logenthiran Thillainathan and Dhivya Sampath Kumar</i> Newcastle University in Singapore, Singapore
14:00~14:15	412	An Implementation Evaluation Method of Demand Response considering Secondary Peak Effect <i>Shihai Yang, Feng Ji, Xiaodong Cao, Hongwei Shen and Li Huang</i> Jiangsu Zhizhen Energy Technology Limited Inc, China
14:15~14:30	518	A Method to Forecast Storm-Caused Distribution Grid Damages Using Cost-Sensitive Regression Algorithm <i>Fauzan Jufri, Seongmun Oh, Jaesung Jung and Min-Hee Choi</i> Ajou University, South Korea
14:30~14:45	816	New Performance Indicators for Evaluating the Power System Static Security with STATCOM/BESS <i>Huimin Wang, Qi Huang and Zhaojun Li</i> University of Electronic Science and Technology of China, China
14:45~15:00	868	Load Shedding Method of Power Restoration of Distribution Network Based on SOP <i>Zhigang Xie, Bei Han, Guojie Li, Chenbo Xu and Caiming Jiang</i> Shanghai Jiao Tong University, China
15:00~15:15	976	A Reliability-based DG Planning Method against Ice Storm Weather <i>Chaofan Lin, Di Fang, Zhaohong Bie and Liang Gao</i> Xi'an Jiaotong University, China
15:15~15:30	981	A Review of Smart Grid Restoration to Enhance Cyber-Physical System Resilience <i>Hamed Haggi, Reza Roofegari Nejad, Meng Song and Wei Sun</i> University of Central Florida, United States

SS02- Machine Learning and its applications to Power Systems-I

Session Chairs: Xuan Liu , Hunan University

Liang Che, Hunan University

Venue: Four Seasons Hall-3,4 (四季 3、4 厅)

Time	Paper ID	Title & Authors
13:30~13:45	122	Wind turbine generator fault detection based on multi-layer neural network and random forest algorithm <i>Xiangwu Yan, Yongsheng Jin, Yun Xu and Ruojin Li</i> North China Electric Power University, China
13:45~14:00	206	Deep Learning for Predicting the Operation of Under-Frequency Load Shedding Systems <i>Youqiang Xiao, Rongzhen Zhao and Yunfeng Wen</i> Chongqing University, China
14:00~14:15	243	The Analysis of State Estimator Condition Number: A Machine Learning Approach <i>Xi He, Chunming Tu, Peiqiang Li and Pingjuan Ge</i> Hunan University, China
14:15~14:30	271	Analysis of 10kV Non-technical Loss Detection with Data-driven Approaches <i>Zheng Wang, Guodong Li, Xudong Wang, Chang Chen and Huan Long</i> Southeast University, China
14:30~14:45	420	Day-Ahead Security Constrained Unit Commitment with controllable risk <i>Xin Zhu, Xuan Liu and Yinhui Shang</i> Hunan University, China
14:45~15:00	434	Isolation Forest based Detection for False Data Attacks in Power Systems <i>Yufei Song, Xuan Liu, Zongchao Yu, Jianwei Tian and Mu Chen</i> Hunan University, China
15:00~15:15	555	Knowledge Acquisition for Transformer Condition Assessment Using Synthetic Minority Over-Sampling Technique and Decision Tree Algorithm <i>Hua Xie, Junxing Chen, Pei Zhang, Fang Zhang, Xiangfei Meng and Jiaxu Cheng</i> Beijing Jiaotong University, China

WEDNESDAY, MAY 22

Special Sessions

16:00-18:00 | WEDNESDAY, MAY 22

SS03- Planning, Operation and Control Techniques for Integrated Systems with Distributed Photovoltaic and Cascaded Small-Hydropower Stations

Session Chairs: Xiaoyan Han, State Grid Sichuan Electric Power Company

Gang Chen, State Grid Sichuan Electric Power Company

Venue: Brocade City Hall-1,2 (锦城 1、2 厅)

Time	Paper ID	Title & Authors
16:00~16:15	612	An new method of photovoltaic generation fluctuation suppression for cascade hydro-photovoltaic-pumped storage generation system <i>Lei Chen, Jun Wang, Fan Wu, Xiaoyan Han, Zhang Sun and Gang Chen</i> Xihua University, China

16:15~16:30	618	An optimal operation method for cascade hydro-photovoltaic-pumped storage hybrid generation system <i>Xing Huang, Jun Wang, Si Xiong and Tao Wang</i> Xihua University, China
16:30~16:45	668	Application of Vortex Dynamics Diagnosis in Numerical Simulation of Tubular Turbine <i>Dan Yao, Zhenggui Li, Shengyang Peng, Xinrui Li, Shiyang Pan, Xianzhu Wei, Fengchen Li, Xiaoyan Han and Xueren Wang</i> Xihua University, China
16:45~17:00	818	Emergency Control for Improving Transient Stability of Integrated Systems with Photovoltaic and Hydropower Stations Based on EEAC Theory <i>Weitao Chen, Xiangyu Wu, Yin Xu, Jinghan He and Zheng Shi</i> Beijing Jiaotong University, China
17:00~17:15	875	Feasibility Analysis of Pumped Storage Integration for PV Fluctuation Mitigation <i>Zhengbo Chen, Xiao Xu, Jichun Liu, Weihao Hu, Junyong Liu, Shaosen Zhou, Hua Zhang and Xiaoyan Han</i> Sichuan University, China
17:15~17:30	886	Analysis on Internal Flow Characteristics of Tubular Turbine Draft Tube <i>Shi-Yang Pan, Zheng-Gui Li, Xin-Rui Li, Xiao-Bing Liu, Yong-Zhi Zhao, Xiao-Yan Han, Xian-Zhu Wei and Feng-Chen Li</i> Xihua University, China
17:30~17:45	959	Microgrids as Electrification Alternatives for the Amazon Region in Ecuador <i>Jean-Michel Clairand, Héctor Chinchero-Villacís, Xavier Serrano and Andrés Gonzalez-Zumba</i> Universidad de las Américas - Ecuador, Ecuador
17:45~18:00	999	Optimized Operation of Photovoltaic and Pumped Hydro Storage Hybrid Energy System in the Electricity Market <i>Kai Liu, Weihao Hu, Xiao Xu, Qi Huang, Zhenyuan Zhang and Zhe Chen</i> University of Electronic Science and Technology Of China
18:00~18:15	911	Numerical Analysis of Cavitation Flow in Low <i>Chang-Shen Lu, Zheng-Gui Li, Xinrui Li, Xin Chai, Xiao-Bing Liu, Chuan-Qi Ou, Dan Yao, Biao Ma and Wei-Jun Wang</i> Xihua University, China

SS04- Machine Learning and its applications to Power Systems-II
Session Chairs: Xuan Liu, Hunan University
Liang Che, Hunan University
Venue: Four Seasons Hall-3,4 (四季 3、4 厅)

Time	Paper ID	Title & Authors
16:00~16:15	596	Multi-dimensional Evaluation of Temporal Neural Networks on Solar Irradiance Forecasting <i>Zhenyu Song and Laura Brown</i> Michigan Technological University, United States
16:15~16:30	660	BP Neural Network Based Fault Prediction of Distribution Network during Typhoon Disaster <i>Chen Yu, Bin Chen, Jiaxin Chen, Yunyun Xie, Gongxin Li and Kang Chang</i> NARI Group Corporation (SGEPRI), China

16:30~16:45	666	Research on Minimum Schedulable Power Optimization of CCHP System <i>Kun Zhang, Xinran Li and Jinming Liu</i> Hunan University, China
16:45~17:00	854	A Simulation Approach to Multi-station Solar Irradiance Data Considering Temporal Correlations <i>Xingbo Fu, Feng Gao, Jiang Wu, Ruanming Huang, Yichao Huang and Fei Fei</i> Xi'an Jiaotong University, China
17:00~17:15	907	An Ensemble Machine Learning Based Fault Classification Method for Faults During Power Swing <i>Dinesh Patil, Od Naidu, Preetham Yalla and Hida S</i> ABB Corporate Research Center, India
17:15~17:30	963	Research on Credibility of the Dynamic Simulation Results of Power Grid Frequency Regulation based on the Hybrid System Model <i>Qin Liu, Mingkui Wei, Yong Li, Weihua Luo, Qiang Lan, Zhida Su, Xiong Xiao, Song Xiao</i> Southwest Jiaotong University, China

Poster Sessions

13:30~18:00 | WEDNESDAY, MAY 22

WEDNESDAY, MAY 22

Poster Session I		
Venue: Jinjiang Hall		
Time: 13:30-15:30		Session Chairs: Yunlong Teng and Bi Liu University of Electronics Science and Technology of China
Board Number	Paper ID	Title & Authors
1	14	The investigation on state evaluation method and its correction of 220kV oil immersed transformers with big data analysis <i>Xinghua Liu, Peng Gao, Kecun Han, Xuebin Lv, Chao Yang, Tongping Xie, Yang Yu, Peng Sun, Jian Guo and Hongshun Liu</i> Shandong University, China
2	23	Optimization of Black-Start Scheme for Mitigating Overvoltage <i>Lu Zhang, Zhaoxia Jing, Tianyao Ji and Yi Sun</i> South China University of Technology, China
3	39	Research on Pricing Segmentation Method of Electric Vehicle Charging Service Fee <i>Liu Juan</i> Nari group corporation/state grid electric power research institute, China
4	46	Security Evaluation under N-1 for Active Distribution Networks Coordinated with Transmission Grid <i>Zufeng Hou, Jiaqi Chen, Yuan Liang, Yong Zhang and Wei Wu</i> Department of Electrical Engineering, Tsinghua University, People's Republic of China
5	47	Research and Application Based on Network Security Monitoring Platform and Device <i>Qingdong Meng, Dan Li and Yu Ma</i> Northeast Branch of State Grid Corporation of China, China
6	65	Reconfiguration of Radial Distribution Systems for Power Loss Minimization Using Salp Swarm Optimization Algorithm <i>Hanan Hamour, Salah Kamel, Juan Yu, Kaigui Xie, Loai Nasrat and Mansur Khasanov</i> Chongqing University, China
7	76	Abrupt Change Detection of Home Electrical Appliance Signals Using Mathematical Morphology Gradient <i>Lu Zhang, Zhaoxia Jing, Francois Auger, Xinglei Han, Sarra Houidi and Kien Bui Huu</i> South China University of Technology, China
8	88	Design of temperature control system for high-precision position sensor calibration thermostat based on Fuzzy-PID compensation <i>Li Shujiang, Ma Chi, Fu Wei, Li Zhongshuang and Tao Shaojia</i> School of Information Science and Engineering, Shenyang University of Technology, China
9	138	Analysis of Half-Wavelength Transmission Lines System State in Operation <i>Weifang Lin, Jun Yi, Fangfang Yu, Junchuan Jia, Ansi Wang and Xinyue Wang</i> CEPRI, China

Time: 13:30-15:30		Session Chairs: Yunlong Teng and Bi Liu University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
10	164	Root Cause Analysis of Abnormal Conduction of Electric Trigger Converter Valve in HVDC Projects <i>Kun Liu, Zhen Wang and Jing Zhuang</i> China Southern Power Grid EHV Power Transmission Company Maintenance & Test Center
11	192	Power System Real Time Reliability Monitoring and Security Assessment in Short-term and on-line Mode <i>Dajiang Wang, Yefeng Jiang, Chenguang Qiu, Hao Xiong, Mingde Bi, Yaming Ge, Jie Li, Yi Cao, Gang Li, Zhanfei Cui, Zhaoyang Yan, Tao Zhu, Yun Chai and Shoukui Zhang</i> State Grid Jiangsu Electric Power Company Research Institute, China
12	210	A gossip-based asynchronous distributed algorithm for economic dispatch problem with transmission losses <i>Rui Wang, Qiqiang Li, Yang Shi and Luhao Wang</i> School of Control Science and Engineering, Shandong University, China
13	216	Influence of HVDC Reactive Power Compensation Modeling Method on Short-Circuit Current Calculation <i>Ying Wang, Kunpeng Zhou, Kan Cao, Defu Cai, Haiguang Liu and Xuemao Zhao</i> State Grid Hubei Electric Power Research Institute, China
14	217	Short-Term Load Forecasting of Smart Grid Based on Load Spatial-Temporal Distribution <i>Gangui Yan, Tianyi Han, Wei Zhang and Shujian Zhao</i> Northeast Electric Power University, China
15	237	Short-term Photovoltaic Output Prediction Method Based on Similar Day Selection with Grey Relational Theory <i>Yang Cui and Jiarui Zhang</i> Key Laboratory of Modern Power System Simulation and Control & Renewable Energy Technology, Ministry of Education (Northeast Electric Power University), China
16	241	The Study and Application of Field Test Technology of UHVDC Protection System <i>Xiangping Kong, Peng Li, Xinyue Gong, Chi Zhang and Qiang Luo</i> State Grid Jiangsu Electric Power Co., Ltd. Research Institute, China
17	242	Static security control method to solve UPFC near area equipment overload <i>Li Feng, Peng Hui-Min, Yuan Hui-Ling and Li Wei</i> NARI GROUP Corporation/State Grid Electric Power Research Institute, China
18	263	Research on the Structure Optimization of Grid Frame Based on Generalized Slow Coherency Clustering <i>Weiqiang Liang and Fei Tang</i> Wuhan University, China
19	265	Fault Location of Distribution Network Based on Multi-method Fusion <i>Yiwen Gao, Wenye Zhou, Shilong Li, Huajie Zhang and Xiangxi Duan</i> State Grid Sichuan Electric Power Research Institute, China

Time: 13:30-15:30		Session Chairs:Yunlong Teng and Bi Liu University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
20	272	Distribution Network Topology Error Identification Method Based on D-PMU and Branch State Function <i>Yang Liu, Jinping Sun, Qifang Chen and Mingchao Xia</i> Beijing Jiaotong University, China
21	314	Analysis on AC Voltage Characteristic of UHVDC Converter Station and Dynamic Compensation <i>Zheqian Jin, Qian Chen, Haoqing Xiong, Wenhai Zhou, Xiaolu Deng and Qi Zhang</i> College of Energy and Electrical Engineering, Hohai University, China
22	328	Research and Development of Advanced Applications for Relay Protection Fault Information System Adaptable to Smart Dispatch <i>Dongliang Nan, Hongshan Zhuang, Yuting Dong, Jie Wu, Yi Yang and Yonghui Sun</i> Hohai University, China
23	338	Study on 24h Dynamic Reactive Power Optimization Considering Safety Operation Limit of Generators <i>Bin Lu, Xi Xu, Zhipeng Xu, Wen Wang and Xuenan Gu</i> NARI Technology Co. Ltd., China
24	432	The coordinated control of thermostatically controlled loads and energy storage considering the lock-out effect <i>Mingchao Xia, Yuguang Song and Qifang Chen</i> Beijing Jiaotong University, China
25	463	Investment Optimization of Incremental Distribution Network Based on Cooperative Game in the Context of Investment Liberalization <i>Xijun Ren, Bin Ye, Haiwen Shao, Ciwei Gao and Na Yang</i> Southeast University, China
26	490	Research on the Influence of Demand Response on the Life of Distribution Network Transformer <i>Jiefu Tian, Hui Ren, Lining Hu, Fei Wang and Huixin Feng</i> North China Electric Power University, China
27	585	Status Evaluation of Power Secondary Equipment Based on Big Data of Monitoring <i>Xiangxi Duan, Shilin Feng, Yiwen Gao, Cheng Long, Rongsen Luo and Yongchao Sun</i> State Grid Sichuan Electric Power Research Institute, China
28	607	Impact of Network Structure on Short-Term Voltage Stability Using Data-Driven Method <i>Wanjun Huang, Xinran Zhang and David Hill</i> The University of Hong Kong, China
29	627	Efficiency Evaluation of Electric Power Industry Based on DEA Model <i>Delv Zhu, Jing Shi, Jiaqi Xu, Kaihui Nan, Wang Zhang, Xiang Fang and Ying Xiao</i> State Grid Jiangsu Electric Power Co., Ltd.Economic Research Institute, China
30	633	Transmission Line Fault Identification Based on BP Neural Network <i>Ran Kou and Yuhong Wang</i> Sichuan University, China

Time: 13:30-15:30		Session Chairs: Yunlong Teng and Bi Liu University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
31	634	Analysis of Voltage Stability Weak Nodes Location and Optimization Measures in DC Multi-infeed Receiving-end Power Grid <i>Zhang Wenjia, Liu Daigang, Ge Yi, Sun Wentao, Wang Quanquan and Shi Jing</i> State Grid Jiangsu Electric Power Company Economic Research Institute, China
32	635	Research on Reconstruction Method of Multi-terminal Electromagnetic Loop Networks <i>Feng Zhang, Quanrui Hao, Guixing Yang, Guoteng Wang, Pengpeng Kang and Zheng Xu</i> Zhejiang University, China
33	651	Tabulating Cybersecurity Solutions for Substations: Towards Pragmatic Design and Planning <i>Hengchuan Tan, Carmen Cheh, Binbin Chen and Daisuke Mashima</i> ADSC, Singapore
34	669	Design of Information System Cyber Security Range Test System for Power Industry <i>Yongyuan He, Longchuan Yan, Jiaoli Liu, Dongxia Bai, Zhiyu Chen, Xuehao Yu, Dequan Gao and Jing Zhu</i> SGCC, China
35	708	Distribution Network Topology Model Generation Method for Distributed Feeder Automation <i>Ran Chen, Jian Lu, Mingxiang Liu, Jun Ying, Yalou Chen and Shiyong Feng</i> NARI Group Co. Ltd. (State Grid Electric Power Research Institute), China
36	759	Analysis on Impact of Baihetan Inverter Connection Modes on Stability of Zhejiang Power Grid <i>Guoteng Wang, Wen Hua and Zheng Xu</i> Zhejiang University, China
37	820	Study on Voltage and Reactive Power Control of 10kV Direct Load Supply of 220kV Transformer Substation <i>Xue Gong, Jiang Xie and Xingli Li</i> State Grid Yibin Power Supply Company, China
38	864	Optimization of Artificial Bee Colony Algorithm Based Load Balancing in Smart Grid Cloud <i>Luo Cheng Shen, Jia Zhou Li, Yan Wu, Zhenyu Tang and Yi Wang</i> State Grid Sichuan Electric Power Company, China
39	906	Power System Transient Stability Assessment Method Based on CapsNet <i>Xu Tian, Jun An and Gang Mu</i> Northeast Electric Power University, China
40	925	Active-adaptive control system of the thyristor voltage regulator <i>Elena Sosnina, Rustam Bedretdinov, Evgeny Kryukov and Andrey Smirnov</i> Nizhny Novgorod State Technical University n.a. R.E. Alekseev, Russia
41	936	Power System Text Information Matching Research Based on Deep Learning <i>Wei Bao, Chengyu Lu and Huafeng Luo</i> Research center. Hangzhou WR Power Science & Technology Co. Ltd, China

Time: 13:30-15:30		Session Chairs:Yunlong Teng and Bi Liu University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
42	949	Developing a Decision Support System for the Optimal Operating Strategies of a Polygeneration Facility <i>Maximiliano Lainfiesta, Xuwei Zhang, Jinjie Wu and Huihui Song</i> Harbin Institute of Technology-Weihai, China
43	951	An Ensemble Wavelet Deep Learning Approach for Short-term Load Forecasting <i>Zhiwei Song, Zhaojing Cao, Can Wan and Shenglan Xu</i> Zhejiang University, China
44	956	Frequency Regulation Energy Storage Utility Evaluation Based on Different Power Supply Structures <i>Hao Chen, Yong Sheng, Yanbing Jia, Jin Zheng, Tianhao Song, Gang Luo and Dong Xie</i> Taiyuan University of Technology, China
45	968	Docker-based Simulation Training System on Dispatching and Control Cloud <i>Qun Ma, Jiabing Han, Zhengqing Xu, Xuanhuai Yang and Qunshan Li</i> Beijing Kedong Electric Power Control System Co., Ltd, China
46	1004	Fast State Estimation of Power System based on Extreme Learning Machine Pseudo-Measurement Modeling <i>Yubin Wang, Mingchao Xia, Qifang Chen, Fangjian Chen, Xiaonan Yang and Feng Han</i> Beijing Jiaotong University, China
47	1013	Fault Location and Fault Type Recognition of Power System Based on Wavelet Transform <i>Xiaotian Tang, Zhenyuan Zhang, Qi Huang and Yan Gong</i> University of Electronic Science and Technology Of China, China
48	115	Smart Substation Secondary Equipment Defect Diagnosis Method Based on Information Flow <i>Wenyue Zhou, Xia Li, Yongkang Zheng, Mingzhong Liu, Xuanwen Ding and Xin Zhu</i> State Grid Sichuan Province Electric Power Company, China
49	250	Optimal Energy Flow of Integrated Energy System Considering Distributed Energy Resources <i>Yongjie Zhong, Hongwei Zhou, Xuanjun Zong, Kai Yang and Yonghui Sun</i> Hohai University, China
50	194	Research on the Transformer Area Recognition Method Based on Improved K-Means Clustering Algorithm <i>Chen Liu, Junping Wang, Xiaohua Wang, Meng Wu, Jialing Bai and Libo Lian</i> Tsinghua Sichuan Energy Internet Research Institute, China
51	472	Indirect PCA Dimensionality Reduction Based Machine Learning Algorithms for Power System Transient Stability Assessment <i>Kening Chen</i> China State Grid Energy Research Institute, China
52	492	A kind of Recommendation Algorithm of Matrix Decomposition Based on Power Grid User Rating Characteristics <i>Tingting Zeng and Daxing Wang</i> Sichuan Grid Industrial Group Co., Ltd, China

Time: 13:30-15:30		Session Chairs: Yunlong Teng and Bi Liu University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
53	862	Wind power prediction based on the chaos theory and the GABP neural network <i>Lina Zhu, Hongtao Shi, Maosheng Ding, Tianji Gao and Zhongnan Jiang</i> College of Electrical and Information Engineering, North Minzu University, China
54	551	Virtual Power Plant Model for the Cluster of Household Prosumers Based on Minkowski Sum <i>Lu Qiu-Yu, Tan Yan, Duan Li-Juan and Yang Yin-Guo</i> Tsinghua University, China
55	781	Virtual Power Plant Optimization Decision Method Considering the Interaction Between Combined Cooling-Heating and Power and Electric Heating Equipment <i>Honghui Kuang, Shaoqing Guo and Hui Ni</i> Beijing QU Creative Technology Co., Ltd., China
56	519	A Combined ARIMA-PPR Model for Short-Term Load Forecasting <i>Lintao Yang and Honggeng Yang</i> College of Electrical Engineering and Information Technology, Sichuan University, China
57	664	Identifying Correlation between Planning Strategy and Reliability of Distribution Networks Based on Machine Learning <i>Yang Wang, Yue Xiang and Junyong Liu</i> Sichuan University, China
58	701	Review of Machine Learning in Power System <i>Zhibo Ma and Chi Zhang</i> University of Bath, United Kingdom
59	930	Research of Fault Diagnosis and Location of Power Transformer Based on Convolutional Neural Network <i>Jia Qin, Bowen Zhou and Ziheng Mi</i> Northeastern University, China
60	235	A Method for Identifying Connectivity Relationship in Low-Voltage Area Based on Voltage Big Data <i>Shuang Wu, Wei Hu and Yu Dong</i> Tsinghua University, China
61	249	Efficient Abnormal Load Identification in Large-Scale Power System employing Rayleigh Quotient Method and Parallel Computing Techniques <i>Song Han and Hongqian Li</i> Department of Electrical Engineering, Guizhou University, China
62	409	Detection and Identification of Bad Data Based on Neural Network and K-means Clustering <i>Tong Zhang, Yi Wang, Jian Ning and Mingyu Zhai</i> Nari Group Corporation, China
63	643	A New Attack Separation Scheme Based on Bilinear State Estimation <i>Wenli Xue, Huaizhi Wang and Xichang Wen</i> Shenzhen University, China

Time: 13:30-15:30		Session Chairs: Yunlong Teng and Bi Liu University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
64	720	Research on Predicting the Short-term Output of Photovoltaic (PV) Based on Extreme Learning Machine Model and Improved Similar Day <i>Yongmei Jiang, Xiaoni Chi, Yang Yang, Jinzi Miao and Qiuxuan Wu</i> Hangzhou Dianzi University, China
65	842	Data-Driven System-Side Harmonic Impedance Estimation Method for UHVDC Converter Station <i>Haiwei Xie, Wentao Lv, Shengyuan Liu, Feng Chen, Zhenzhi Lin and Diya Zhou</i> College of Electrical Engineering, Zhejiang University, China
66	952	A General Real-time OPF Algorithm Using DDPG with Multiple Simulation Platforms <i>Huanhuan Nie, Ying Chen, Yankan Song and Shaowei Huang</i> Tsinghua University, China
67	988	Mitigating Multi-Stage Cascading Failure by Reinforcement Learning <i>Yongli Zhu and Chengxi Liu</i> GEIRI North America

Coffee Break

Poster Session II
Venue: Jinjiang Hall

Time: 16:00-18:00		Session Chairs: Ying Liu, University of Electronic Science and Technology of China Xiawei Wu, University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
68	38	Probabilistic Small Signal Stability Assessment of Large-scale Wind Power Integration <i>Ping He and Jie Chen</i> Zhengzhou University of Light Industry, China
69	70	Assessment Integration of Wind-based DG and DSTATCOM in Egyptian Distribution Grid Considering Load Demand Uncertainty <i>Salah Kamel, Ashraf Ramadan, Mohamed Ebeed, Juan Yu, Kaigui Xie and Tao Wu</i> Chongqing University, China
70	73	Designs and Applications for the Controller Parameters of the Photovoltaic System <i>Bo Wang, Hai-juan Shen, Shao-zhen Chen, Dong Wang, Ke Yang</i> State Grid E-Commerce Co. LTD, China
71	74	Optimal Siting and Sizing of Energy Storage System in Distribution Grid Considering Power Supply Reliability <i>Qiu Di, Liu Dong, Yingtu Mao and Yikai Sun</i> Shanghai Jiao Tong University, China
72	92	Feasibility Study to Install a 1 MW Grid Connected Solar Plant in Wairoa- Mahia Peninsular, New Zealand <i>Anthony Garae-Liu and Tek Tjing Lie</i> Auckland University of Technology, New Zealand

Time: 16:00-18:00		Session Chairs: Ying Liu, University of Electronic Science and Technology of China Xiawei Wu, University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
73	94	A Novel Sliding Mode Control of Doubly-fed Induction Generator for Optimal Power Extraction <i>Kong Qing Mei, Wang Xiangdong and Li Shujiang</i> Shenyang University of Technology, China
74	106	Control Strategy Analysis of Grid-connected Energy Storage Converter Based on Harmonic Decomposition <i>Yonggan Xu, Jian Luo, Kunming Tang, Jie Jiang, Xin Gou, Jiawei Shi and Bingwen Lu</i> Chongqing University, China
75	107	Volt/VAR Control with DERs, LTCs, and Switched Capacitors: Case Study with a Commercial Distribution System <i>Ling Jiang and Keyue Smedley</i> University of California Irvine, US
76	165	DERs Sizing of Hybrid Microgrid by Hierarchic Optimization Strategy <i>Kang Kai, Zhang Yunlong, Cao Zixun, Li Hui and Chen Hongkun</i> Wuhan University, China
77	170	Renewable Energy-based Micro-Grid; a Zero-Emission Option for Electricity Production in Australia <i>Ahmad Zahedi</i> James Cook University, Australia
78	189	Distributed Generation Low-Carbon Trading Strategy Based on Cooperative Game Nucleolus Method <i>Saite Yang, Qian Chen, Jie Yu, Jian Geng, Hongwei Du, Zheqian Jin and Wei Zeng</i> College of Energy and Electrical Engineering, Hohai University, China
79	207	A Peer-To-Peer Market Mechanism for Distributed Energy Resources <i>Fen Lin, Wei Zhang, Xiuli Wang, Yongxi Huang, Shixiong Qi and Ziyi Zhao</i> Xi'an Jiaotong University, China
80	212	SOC-based Hybrid Energy Storage System Dynamical and Coordinated Control for Vessel DC Microgrid <i>Hao Li, Lijun Fu, Yan Zhang, Xueping Gao and Yunfeng Lin</i> Naval University of Engineering, China
81	218	Model Predictive Control based Load Frequency Control for Power Systems with Wind Turbine Generators <i>Xiaofei Sun, Kai Liao, Jianwei Yang and Zhengyou He</i> Southwest Jiaotong University, China
82	225	The Characteristics and Challenge on Large-Scale Renewable Energy Grid Integration <i>Yan Li</i> China Electric Power Research Institute (CEPRI), China
83	232	Online Identification Strategy of Synchronous generator Based on Laplacian Eigenmap Algorithm for Wind Power System <i>Huazhi Chen, Yang Liu, Fei Tang, Chufei Xiao, Weiqiang Liang, Mengqi Qing and Fang Zhou</i> Wuhan University, China

Time: 16:00-18:00		Session Chairs: Ying Liu, University of Electronic Science and Technology of China Xiawei Wu, University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
84	238	The Research of Sub-Synchronous Oscillation in DFIG Wind Farm under Weak AC Grid <i>Caihong Dong, Peng Zhang, Yang Bai, Jiaxin Hu and Tianshu Bi</i> North China Electric Power University, China
85	251	Probabilistic assessment of distribution network with high penetration of distribution generations <i>Xiongguang Zhao, Feifei Wang, Chenxu Wang, Fei Tang, Dichen Liu, Mengqi Qing and Mengjiao Qing</i> Wuhan University, China
86	253	Reactive Power and Voltage Coordinated Control of Wind Farm for Parallel Running STATCOM <i>Lufei Xu, Hailiang Zhong and Tianhua Chen</i> NARI Group Corporation (State Grid Electric Power Research Institute), China
87	260	Short-term load forecasting based on Elman Neural Network optimized by Firefly Algorithm <i>Haitao Liu, Xiao Sun, Lun Xu, Si Gu and Fang Sun</i> Nanjing Institute of Technology, China
88	262	The Application of M3C Based on Optimized Sorting in Fractional Frequency Transmission System <i>Wenhao Wang and Mingdong Wang</i> Zhengzhou University, China
89	282	Study of the Hierarchical Control System for DC Micro-grid <i>Lili Yu, Zhaoyun Zhang, Yitao Liu and Wei Wang</i> Dongguan University of Technology, China
90	295	Optimal allocation of distributed generation based on multi-objective ant lion algorithm <i>Haitao Liu, Lun Xu, Chao Zhang, Xiao Sun and Jing Chen</i> Nanjing Institute of Technology, China
91	344	Fixed Change-Rate Matrix Correction Algorithm for Processing PV Nodes in Active Distribution Network Power Flow Calculation <i>Fei Chang, Qian Zhu, Shuai Hu, Zhanwang Li, Zhendong Zang and Rui Wang</i> Southeast University, China
92	382	Integrated Decision Making of Distribution Network Planning Schemes Based on EW-GRA Algorithm Combined with P-OWA Operator <i>Yanxun Qi, Ruanming Huang, Han Wu, Qing Xie, Dong Peng</i> North China Electric Power University, China
93	400	DE algorithm based double-layer frame of power flow calculation for loop distribution networks <i>Yulu Zhou, Yalin Chen and Jingrui Zhang</i> Xiamen University, China
94	423	Uncertainty Analysis of Wind Power Fluctuations in Yunnan Power Grid <i>Pingping Xie, Jizhong Zhu, Jin Zou and Peizheng Xuan</i> Electric Power Research Institute, China Southern Power Grid, China

Time: 16:00-18:00		Session Chairs: Ying Liu, University of Electronic Science and Technology of China Xiawei Wu, University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
95	448	Reactive Power Optimization of Power Grid with Photovoltaic Generation Based on Improved Particle Swarm Optimization <i>Huibo Liu, Guoying Huang, Chun Wang, Haixuan Liu, Zizhao Wang, Ziwei Xu and Linjun Shi</i> Hohai University, China
96	478	Comprehensive Performance Evaluation and Research of RE-CCHP System <i>Saniye Maihemuti, Weiqing Wang, Haiyun Wang and Jiahui Wu</i> Xinjiang University, China
97	481	Research and Application of Rapid Frequency Response Technology for New Energy Power Station <i>Hua Guanghui, Hu Ruwei, He Weiguo, Kong Ailiang and Liang Shuo</i> CEPRI, China
98	515	Dynamic Pricing for Microgrids Energy Transaction in Blockchain-based Ecosystem <i>Jingpeng Yue, Zhijian Hu, Chendan Li, Amjad Anvari Moghaddam, Josep M. Guerrero and Jeremy Dulout</i> Wuhan University, China
99	523	Switch Optimal Planning in Distribution Networks based on Dynamic Programming <i>Tao Wei, Jian Su, Jiming Ma and Wenjie Hong</i> Hangzhou Yangsi Information Technology Co. Ltd., China
100	559	Integrated operation mode of grid-connected microgrid considering double-layer demand response <i>Huimin Wang, Ping Yang, Rui Gao and Zhijun Ren</i> South China University of Technology, China
101	589	Coordinated Primary Frequency Control for Virtual Power Plant Based on Distributed Subgradient-Projection Method <i>Yin-Guo Yang, Qiu-Yu Lu, Shuang-Xi Wu, Zhongguan Wang and Tian Xia</i> Tsinghua University, China
102	626	Analysis and Inspiration of the National Load all Powered by Renewable Energy in Portugal <i>Wei Yang</i> Centro de Investigação em Energia REN - State Grid, S.A., Portugal
103	636	Capacity Assessment of VAR Compensation in Distribution Network using Multi-parametric Programming <i>Zhenyi Wang, Chuan Zhao, Ronghua Duan and Tian Xia</i> Tsinaghua University, China
104	642	Frequency Regulation Strategy for DFIG Combining Over-speed Control and Adaptive Virtual Inertia <i>Huanjing Lao, Li Zhang, Tong Zhao and Liang Zou</i> Shandong University, China
105	655	Imprecise reliability of lifetime data based on three-parameter generalized inverse Weibull distribution <i>Changhai Li, psoter, Lulu An and Qiuge Dan</i> University of Electronic Science and Technology of China, China

Time: 16:00-18:00		Session Chairs: Ying Liu, University of Electronic Science and Technology of China Xiawei Wu, University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
106	685	Research on the Impact of Wind Power Integration on Power System Voltage Stability <i>Yinqiao Wang, Zhimin Li and Fang Lu</i> Harbin Institute of Technology, China
107	739	Grid Integration and Demand Response Management of Geothermal Power Plant with Hybrid Energy Storage System in Indonesia <i>Ardila Johan Erdiansyah, Xibeng Zhang and Abhisek Ukil</i> University of Auckland, New Zealand
108	756	The system of implementation effect evaluation for distribution network planning and design standard <i>Yuqing He, Chongbo Sun, Yifei Wang, Weihong Yang, Cong Liu, Shigong Jiang and Can Cui</i> State Grid Hunan Electric Power Corporation, Economical and Technical Research Institute, China
109	757	A converter control strategy based on droop control in distributed generation systems <i>Liu Dezhou, Fan Siyang, Qu Hang, Liu Chong and Jiang Zhe</i> Systems Engineering Research Institute, China
110	821	Battery Cell Temperature Estimation Model and Cost Analysis of a Grid-Connected PV-BESS Plant <i>Md Mehedi Hasan and Seyyed Ali Pourmousavi Kani</i> School of ITEE, The University of Queensland, Australia
111	832	DC Bus Voltage Regulation for Distributed Energy Sources through Buck-Boost Converter in a Direct Current Micro Grid <i>Asif Raza Solangi, Qi Huang, Ghalib Raza, Muneer Abbas and Siraj Hyder Solangi</i> University of Electronic Science and Technology of China, China
112	844	Optimal Dispatch Model of Wind Power Accommodation in Combined Heat and Power System Based on Unit Commitment <i>Chaofan Hu, Zhiqiang Luo, Shengyu Zhou, Huabao Xie and Linxian Hu</i> Harbin Institute of Technology, China
113	877	Effect of Temporary DC Fault of FB-MMC-HVDC on Offshore Wind Farm Based on DFIGs <i>Xia Chen, Zeyuan Yu and Wenhui Tang</i> South China University of Technology, China
114	881	Reliability Assessment of Standalone Wind-Based Energy Storage System Using Monte Carlo Simulation <i>Nemer Amleh, Mohammad Almuahini and Muhammed Khalid</i> King Fahd University of Petroleum and Minerals, Saudi Arabia
115	892	Research on Improving the Operation Stability of Wind Farms Connected to Power Grid by Using VSC-HVDC Containing SMES <i>Ziwei Tan, Yujia Zhai and Feng Wang</i> Hunan University, China

Time: 16:00-18:00		Session Chairs: Ying Liu, University of Electronic Science and Technology of China Xiawei Wu, University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
116	897	Hierarchical and Divisional Optimal Dispatching Strategy for Active Distribution Network based on Hybrid Particle Swarm Optimization <i>Jian Zhao, Ning Zhou, Hao Liu, Qian Sun and Lei Wang</i> State grid Henan electric power company electric power research institute, China
117	899	Impact of large-scale wind power with DFIG on small signal stability of the system <i>Xiaoyi Xu, Ning Chen, Shuangqiu Qian, Hualing Han and Dawei Zhao</i> China Electric Power Research Institute, China
118	923	Coordinated Optimal Planning of Generation and Storage in Hybrid AC/DC Micro-grid <i>Liang Ge, Chaoran Fu and Mingming Wu</i> State Grid Shanghai Municipal Electric Power Company Pudong Supply Company, China
119	929	Voltage Control Partitioning of Wind Power Integration System Based on pilot-bus control space <i>Wei Cui, Yufei Rao, Chenghao Li, Yang Liu, Pengling Ren, Ze Gao and Hua Wang</i> Electrical Power Research Institute of Henan Electric Power Corporation, China
120	948	Review on modeling of photovoltaic power generation systems <i>Dawei Zhao, Luming Ge, Minhui Qian, Dajun Jiang, Linan Qu, Hualing Han, Yanzhang Liu and Xudong Wang</i> China Electric Power Research Institute, China
121	961	Review on modeling of wind power generation systems <i>Minhui Qian, Dawei Zhao, Fubao Wu, Lingzhi Zhu, Ning Chen, Haifeng Li and Ningyu Zhang</i> China Electric Power Research Institute, China
122	1003	A Value-of-Service based Model for Resilient Distribution System Restoration with Microgrids <i>Zhigang Ye, Bo Chen, Chen Chen, Kai Wu and Zihang Zhang</i> Xi'an Jiaotong University, China
123	847	Multiobjective Sizing Optimization for Combined Heat and Power Microgrids Using a Triangular Evaluation Model and the Self-Adaptive Genetic Algorithm <i>Jianyong Zhao, Heng Nian and Liang Kong</i> Zhejiang University, China
124	153	Robust Islanding Identification Technique for single DG Distribution Networks and Rank Based Load Shedding <i>Narayanan K, Girish Ganesan. R, Mahadevan B, Shahbaz Ahmed Siddiqui and Manoj Fozdar</i> Sastra Deemed University, India
125	369	Predicting the Damage of Distribution System by Strong Wind <i>Seongmun Oh, Jaesung Jung, Fauzan Jufri and Min-Hee Choi</i> Ajou University, South Korea
126	156	Optimal Energy Management of Vanadium Redox Flow Batteries Energy Storage System for Frequency Regulation and Peak Shaving in an Islanded Microgrid <i>Hao Quan, Jin Kun Teo, Anupam Trivedi and Dipti Srinivasan</i> National University of Singapore, Singapore

Time: 16:00-18:00		Session Chairs: Ying Liu, University of Electronic Science and Technology of China Xiawei Wu, University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
127	311	Layered real-time optimization and coordinated control of active distribution network considering distributed generation <i>Yunsong Yan, Mingcai Kang, Junfang Zhang, Zhou Xu and Ying Liu</i> Nanjing University of Science and Technology, China
128	457	A Novel Method of Contingency Screening and Ranking in Distribution Network Based on PMU <i>Shuxin Tian, Kunpeng Li and Yang Fu</i> Shanghai University of Electric Power, China
129	429	Fault Section Location Method Based on Random Forest Algorithm for Distribution Networks with Distributed Generations <i>Jinquan Zhao, Xue Xia, Dawei Su, Chunlei Xu and Fan Wu</i> Hohai University, China
130	617	The Working Conditions Optimization of Low-Head Water Turbine with Different Guide Vane Outlet Angle <i>Shengyang Peng, Zhenggui Li, Jiarong Zhang, Yongzhi Zhao, Liang Wang, Demin Liu, Jianming Yang and Bingquan Yang</i> Xihua University, China
131	851	Research & Prospect of Cascade Hydro-photovoltaic-pumped storage Hybrid Power Generation Technology <i>Liang Wang, Xiaoyan Han, Gang Chen, Lijie Ding, Shumin Miao, Hua Zhang, Xiaoqing Chang and Bin Luo</i> State Grid Sichuan Electric Power Company, China
132	771	An Optimized Control Model of Battery Energy Storage Systems for Primary Frequency Response <i>Xiwen Cui, Xinran Li and Kun Zhang</i> Hunan University, China
133	83	The Integrated Generation and Transmission Expansion Planning Considering the Wind Power Penetration <i>Haijun Xing, Shaoyun Hong, Jing Lei, Hong Fan, Shiqian Li, Gang Ren and Yanfang Wu</i> Shanghai University of Electric Power, China
134	86	Statistical Characterization of Solar Irradiance Variability and Its Effect on Step Voltage Regulators <i>Yi Cui, Feifei Bai, Yilu Liu and David Smith</i> Univ of Tenn and Oak Ridge Nat Lab, United States
135	101	Multi-objective Planning of Soft Open Point in Active Distribution Network Based on Bi-level Programming <i>Shenxi Zhang, Ke Li, Libo Zhang, Heng Zhang, Jiawei Lyu and Haozhong Cheng</i> Shanghai Jiao Tong University, China
136	245	Siting of Electric Vehicle Charging Stations Based on Weighted Voronoi Diagram: A Graphic User Interface Design <i>Jinpeng Meng, Yue Xiang, Yang Wang and Junyong Liu</i> Sichuan University, China

Time: 16:00-18:00		Session Chairs: Ying Liu, University of Electronic Science and Technology of China Xiawei Wu, University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
137	257	Research on Distribution Network Planning Containing Micro-grids <i>Lei Shen, Xun Xu, Tianqi Zheng and Jingyue Gu</i> Shibei Power Supply Company of SMEPC, China
138	296	Automatic Simulation of Active Distribution Network Based on Multi-Agent Technology <i>Tianyou Li, Zhixuan Liu, Yanxin Chai, Yue Xiang, Junyong Liu and Zeming Li</i> Sichuan University, China
139	297	Visualization System Design for Investment and Planning of Active Distribution Networks <i>Zhixuan Liu, Fang Lin, Tianyou Li, Yan Lin, Yanxin Chai, Yue Xiang, Junyong Liu and Lili Zhou</i> Sichuan University, China
140	403	Optimal Scheduling to Improve Load Supply Capability Considering the Integration of Electric Vehicles in Active Distribution System <i>Jun Xiao, Hua'An Xie, You Situ, Weideng Yuan and Jiahui Chen</i> Dongguan Power Supply Bureau of Guangdong Power Grid Co. Ltd., China
141	411	Research on Establishment and Method of Performance Evaluation Index System of smart grid Distribution Network <i>Di Wang, Lin Lv, Jie Tang and Xinda He</i> Sichuan University, China
142	503	Security co-planning of generation and transmission considering flexible facility and high-penetration renewable energy <i>Chengming Zhang, Shenxi Zhang, Haozhong Cheng, Jianzhong Lu, Zheng Wang and Xiaohu Zhang</i> Shanghai Jiao Tong University, China
143	640	Research on Multi-objective Planning of Active Distribution Network Considering Energy Storage Operation Strategy <i>Shilong Wang, Xibin Yang, Qinghua Lin, Zhijun Ren, Huimin Wang, Hongxia Guo and Ping Yang</i> South China University of Technology, China
144	741	Weaknesses Identification Using Reliability Tracking in Distribution System with Distributed Generation <i>Jing Pan, Bin Xu, Xiaogang Hou and Lingfeng Kou</i> China Electric Power Research Institute, China
145	753	Modular Distribution Network Reliability Analysis and Comprehensive Evaluation Method <i>Ruoxuan Sun, Mufan Wang, Zaijun Wu, Xiaobo Dou, Yuchao Luo, Jianlong Sun, Liang Cheng and Jian Yuan</i> Southeast University, China
146	835	Research on Power Flow Optimization of Intelligent Distribution Network with Distributed Generation <i>Xuenan Gu, Xi Xu, Zhipeng Yu, Sujuan Huang and Bin Lu</i> NARI Technology Co. Ltd, China
147	848	Urban Smart Energy System Architecture and Key Technology Analysis <i>Xiaoyun Qu, Kou, Hou and Niu</i> China Electric Power Research Institute Co, LTD, China

Time: 16:00-18:00		Session Chairs: Ying Liu, University of Electronic Science and Technology of China Xiawei Wu, University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
148	919	An Optimal Dispatch Strategy of Distribution Networks with Electric Vehicle Charging Stations Integrated Energy Storage <i>Jianjun Fan, Shaocong Bi, Hong Yuan, Yuankai Han, Qiongshan Wu, Xiaoyi Liu and Xiao Li</i> Key Laboratory of Power System Intelligent Dispatch and Control (Shandong University), Ministry of Education, China
149	529	Mid-Long Term Optimized Dispatching of Virtual Power Plant Based on Weighted Kilowatt-hour Battery Loss Model <i>Tianqi Lu, Heyan Zhu, Peng Yu, Chuang Yan, Zhe Nan, Xue Xiao, Zheng Gu and Xiao Pan</i> State Grid Liaoning Electric Power CO, LTD. Power Economic Research Institute, China
150	682	Research on Storage and Processing Method for Renewable Energy Big Data <i>Tie Li, Junci Tang, Feng Jiang, Xiaopeng Xu, Cheng Li and Tao Ding</i> Xi'an Jiaotong University, China
151	772	Research on Cooperative Scheduling Model of Wind-Solar-Thermal Virtual Power Plant Based on Thermal Load Demand <i>Xiuyun Gao, Ying Wang, Feng Zuo, Yan Jiang, Chengzhi Sun, Yimiao Yue and Yan Zhao</i> Economic and Technological Research Institute of State Grid Heilongjiang Electric Power Co., Ltd, China
152	860	Optimal Scheme of Energy Storage System with Wind Power Integration Considering Negative Peak Load Regulation Capacity <i>Linli Liu, Haichao Cui, Yabo Zhao, Haibo Liu, Xiuping Zhang and Xijuan Li</i> Key Laboratory of Power System Intelligent Dispatch and Control (Shandong University), Ministry of Education, China
153	874	A Novel Integrated Control Strategy of Multi-micro Source Microgrid <i>Yannan Dong, Zhiyuan Cai, Henan Dong and Yahong Zheng</i> Shenyang University of Technology, China
154	740	Optimal Planning Model for Integrated District Energy Systems Considering Electricity and Gas Distribution Networks <i>Ke Sun, Weibin Yin, Yanan Wang, Chengcheng Shao and Chun Li</i> Xi'an Jiaotong University, China
155	707	Typical Voltage Quality Optimization Strategy for Distribution Network <i>Shengkai Wang, Jiandong Jiang, Yisheng Fang and Yuanbo Dang</i> Zhengzhou University, China
156	380	Energy Management Optimization Strategy of User Side in Smart Grid Based on Model Predictive Control <i>Ting Zhang, Yueping Xiang, Jianwei Yang and Tianlei Zang</i> School of Electrical Engineering, Southwest Jiaotong University, China
157	211	The Study of Mechanism and Limit Measures for 500kV Single Phase Short Circuit Current Exceeding Limit in UHVDC Converter Station <i>Wang Xi, Li Yan, Zhang Hua, Sun Xinwei and Tang Lun</i> State Grid Sichuan Electric Power Research Institute, China

Time: 16:00-18:00		Session Chairs: Ying Liu, University of Electronic Science and Technology of China Xiawei Wu, University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
158	546	Research on Intelligent Transient Information Monitoring Technology for Overhead Line <i>Liang Zhao, Jian Zhu and Hua Liu</i> State Grid Yangzhou Electric Power Company, China
159	61	Research on Feeder Interconnect Flexible Multi-State Switch <i>Menghan Su, Qunhai Huo, Wei Tongzhen and Guo Xinming</i> The Institute of Electrical Engineering Chinese Academy of Sciences, China
160	944	Time Difference Method to Calculate the Optimal Differential Point of Half-wavelength AC Transmission Line Differential Protection <i>Yarong Guo, Zexin Zhou, Huanzhang Liu and Xingguo Wang</i> China Electric Power Research Institute, China
161	709	Transient Voltage of Hybrid DCCB for MVDC Distribution grids and Its Mitigation <i>Hong Cao, Zexin Zhou, Xiaodong Zhang, Dingxiang Du, Xingguo Wang, Weijie Wen and Jiuxin Ma</i> Tianjin University, China
162	872	A Novel Fuzzy Evidential Reasoning Method Combining Entropy Weight for Power Grid Emergency Capability Evaluation with Uncertainty <i>Zeyuan Yu, Zhewen Niu, Xia Chen and Wenhui Tang</i> South China University of Technology, China
163	141	Research and Demonstration Application of On-line monitoring and evaluation technology for primary frequency regulation in Renewable Energy Power Station <i>Dong Liu, Bo Wang, Xin Shan, Tingxiang Lu, Xiaobo Ling, Zhenning Tan, Jingkai Zhu, Sheng Huang and Zhihua Wang</i> NARI Group Corporation, China
164	89	The Dynamic Subsidy Pricing Mechanism of Clean Energy Central Heating <i>Xin-Nan Zhou, Zhong-Lin Yi, Xuan-Yuan Wang, Zhi-Jie Sun, Feng Xie, Jun Fu, Li-Rong Duan, Feng-Tao Guang and Zhe Jiao</i> State Grid Jibei Electric Power Co., Ltd.; North China Electric Power Research Institute
165	90	Economic Evaluation Model and Application Tool of Electric Energy Substitution <i>Xin-Nan Zhou, Zhi-Jie Sun, Feng Xie, Bei-Bei Sun, Mao-Yi Fang, Zeng-Hui Meng, Wen-Xiu Yang</i> State Grid Jibei Electric Power Co., Ltd.; North China Electric Power Research Institute

AGENDA

THURSDAY, MAY 23

TIME	ACTIVITY	VENUE
08:30-17:30	Registration & Conference Kits Collection	Outside Jinjiang Hall (锦江厅外)
08:30-10:00	Keynote Session III	
	Reliable Power Electronic based Smart Grids <i>Frede Blaabjerg, Aalborg University</i>	Jinjiang Hall (锦江厅)
	Hybrid Intelligent Approach for Classification of Incipient Faults in Transmission Network <i>Gary W. Chang, National Chung Cheng University</i>	
	Automatic Operator (AO): Architecture, Key Technologies and Applications <i>Hongbin Sun, Tsinghua University</i>	
10:00-10:30	Coffee Break	
10:30-12:00	Keynote Session IV	
	Grid Modernization: Challenges, Opportunities, and Solutions <i>Jianhui Wang, Southern Methodist University</i>	Jinjiang Hall (锦江厅)
	Earth Fault Protection in Distribution Networks <i>Bingyin Xu, Shandong University of Technology</i>	
	Challenges and opportunities of Solar PV integrations to national grids <i>Tapan Saha, University of Queensland</i>	
12:00-13:30	Lunch	
13:30-15:30	Technical Sessions (TS13-16) & Special Sessions (SS05-07)	See Next Page
	Poster Session III	Jinjiang Hall (锦江厅)
	Panel - Multi-timescale Transient Stability in Power-Electronized Power Systems	Four Seasons Hall-3,4 (四季 3、4 厅)
15:30-16:00	Coffee Break	
16:00-18:00	Technical Sessions (TS17-20) & Special Sessions (SS08)	See Next Page
	Poster Session IV	Jinjiang Hall (锦江厅)
	Mini-Symposium on Global Energy Interconnection Development and Talent Cultivation	Brocade City Hall-1,2 (锦城 1、2 厅)
	Women in PES (WiP) - Career Advancement, Networking and Education of Women in the Energy Industry	Four Seasons Hall-3,4 (四季 3、4 厅)
18:00-20:00	Banquet	

THURSDAY, MAY 23

Technical Sessions

13:30-15:30 | THURSDAY, MAY 23

Session #	Session Title	Venue
TS13	Grid Operation and Management -VI	Chamber of Dew (浣花轩)
TS14	Emerging Technologies and End-user Systems-III	Chamber of Dialogue (相语堂)
TS15	Grid Operation and Management --VII	Chamber of Peony (牡丹亭)
TS16	Renewable Generation and Distributed Energy Resources Integration-III	Chamber of Blossom (梅兰阁)

16:00-18:00 | THURSDAY, MAY 23

TS17	Grid Operation and Management -VIII	Chamber of Dew (浣花轩)
TS18	Emerging Technologies and End-user Systems-IV	Chamber of Dialogue (相语堂)
TS19	Grid Operation and Management-IX	Chamber of Peony (牡丹亭)
TS20	Renewable Generation and Distributed Energy Resources Integration-IV	Chamber of Blossom (梅兰阁)

Special Sessions

13:30-15:30 | THURSDAY, MAY 23

Session #	Session Title	Venue
SS05	Complementary and Coordinated Planning, Operation and Control of Multi-Energy Systems-I	Chamber of Mist (馨雨阁)
SS06	Uncertainty Handling Techniques for Smart Grid	Chamber of Lotus (芙蓉居)
SS07	Power Electronic Interface for Smart DC Microgrids	Brocade City Hall-1,2 (锦城 1、2 厅)

16:00-18:00 | THURSDAY, MAY 23

SS08	Complementary and Coordinated Planning, Operation and Control of Multi-Energy Systems-II	Chamber of Mist (馨雨阁)
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THURSDAY, MAY 23

Keynote Session III

Chaired by Can Wan



Frede Blaabjerg

IEEE Fellow

President of IEEE Power Electronics Society

Distinguished Lecturer for IEEE Power Electronics Society

Vice President of Danish Academy of Technical Sciences Aalborg University

Speech Title: Reliable Power Electronic based Smart Grids

Abstract: The world is becoming more and more electrified – it is a convenient way to transport energy and in many cases it has high efficiency. The renewable generation has passed 1000 GW of installed capacity without hydro and the modern grid become power converter dominated – with all its possible flexibilities, opportunities and challenges in terms of reliability – this presentation will discuss power grid structure, power converter technology and its reliability as well as discuss challenges like converter-converter interaction and power grid stability.

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

His current research interests include power electronics and its applications such as in wind turbines, PV systems, reliability, harmonics and adjustable speed drives. He has published more than 600 journal papers in the fields of power electronics and its applications. He is the co-author of four monographs and editor of ten books in power electronics and its applications.

He has received 30 IEEE Prize Paper Awards, the IEEE PELS Distinguished Service Award in 2009, the EPE-PEMC Council Award in 2010, the IEEE William E. Newell Power Electronics Award 2014 and the Villum Kann Rasmussen Research Award 2014. He was the Editor-in-Chief of the IEEE TRANSACTIONS ON POWER ELECTRONICS from 2006 to 2012. He has been Distinguished Lecturer for the IEEE Power Electronics Society from 2005 to 2007 and for the IEEE Industry Applications Society from 2010 to 2011 as well as 2017 to 2018. In 2019-2020 he serves a President of IEEE Power Electronics Society. He is Vice-President of the Danish Academy of Technical Sciences too.

He is nominated in 2014-2018 by Thomson Reuters to be between the most 250 cited researchers in Engineering in the world.

THURSDAY, MAY 23

Keynote Session III

Chaired by Can Wan



Gary W. Chang

IEEE Fellow
Chair of IEEE PES Transmission & Distribution Committee
Distinguished Professor and Vice President in Academic Affairs
National Chung Cheng University

Speech Title: Hybrid Intelligent Approach for Classification of Incipient Faults in Transmission Network

Abstract: Voltage sags are often manifested as the permanent or incipient faults occurred in the power system because of equipment malfunctions or failures. The incipient faults which are originally self-cleaning faults may repeatedly occur and gradually develop to a permanent fault after its first occurrence. The incipient fault detection is considered as a crucial task in predictive maintenance for power apparatuses such as transformers, circuit breakers, and underground cables. This presentation describes a hybrid method for incipient faults detection and classification. The proposed method firstly adopts four methods to extract peculiar features from voltage waveforms of abnormal phases recorded by power quality monitors at substations in a transmission network. Then, a feature selection method and the support vector machine combined with particle swarm optimization and are applied to classify various types of incipient faults. Test results show that the proposed method contributes relatively accurate classification of incipient faults and can be employed as a useful tool for condition monitoring of major power equipment in the smart grid.

BIO: Gary W. Chang obtained his Ph.D. degree from the University of Texas at Austin in 1994. He joined the Department of Electrical Engineering at National Chung Cheng University in 1998, where he holds a position of Distinguished Professor and the Vice President in Academic Affairs of the University. At present, Prof. Chang serves as an associate editor for both IEEE Transactions on Power Delivery and IEEE Power Engineering Letters. He also has served as the guest editor for special issues of several IEEE Transactions. Prof. Chang is the past Chair of IEEE PES Power Quality Subcommittee (2016-2017) and currently is the Chair of IEEE PES Transmission and Distribution Committee (2018-2019). He is a co-founder of Taiwan Smart Grid Industry Association and has been actively engaged in the collaboration between academia and local electric power industry since 2009. His areas of research interest include power systems optimization, power quality, renewable energy, and smart grid. Prof. Chang is an IEEE Fellow and a registered Professional Engineer in the state of Minnesota, USA.

THURSDAY, MAY 23

Keynote Session III

Chaired by Can Wan



Hongbin Sun

IEEE Fellow, IET Fellow
ChangJiang Scholar Chair Professor
Tsinghua University

Speech Title: Automatic Operator(AO): Architecture, Key Technologies and Applications

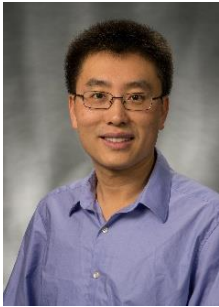
Abstract: With the development of power grids, how to select pivotal features influencing secure operation and discover security knowledge have become the most challenge topic for complex power grids. In the traditional dispatch pattern, dispatching rules are made by experts, which is time-consuming and difficult to find out security features comprehensively and correctly. It will result in neither secure nor economical for power system operations. Thus, it is urgent to develop automatic operator (AO) by artificial intelligence, which we have been working on over the recent ten years. First, the principle and architecture of AO is presented. Then the key technologies of AO are developed, including power transfer interface detection, security feature selection, security knowledge discovery, and knowledge management and application. Furthermore, the AO system is developed originally and has been put into online applications in several Provincial Power Grids in China, including the Guangdong Power Grid. Instead of rough and offline dispatching rules, fine rules can be acquired online by AO, promoting the intelligent decision making in dispatch.

BIO: Hongbin Sun received his double B.S. degrees from Tsinghua University in 1992, the Ph. D from Dept. of E.E., Tsinghua University in 1996. From 2007.9 to 2008.9, he was a visiting professor with School of EECS at the Washington State University in Pullman. He is currently a ChangJiang Scholar Chair professor of Electrical Engineering, Director of Energy Management and Control Research Center, Deputy Dean of Academic Affair Office, Tsinghua University. He also is the Director of Lab of Smart Grid and Renewable Energy, Tsinghua-Berkeley Shenzhen Institute (TBSI). He is IEEE Fellow and IET Fellow, Vice Chair of Energy Committee of World Federal Engineering Organization (WFEO), Chair of IEEE PES Technical Committee on Energy Internet, Deputy Chair of CSEE Technical Committee on Energy Internet, and Chair of IEEE PES Working Group on Smart Grid Voltage Control. He also serves as deputy EIC of CSEE JPES, editor of the IEEE TPWRS and IEEE PEL, associate editor of IET RPG, and member of the Editorial Board of Applied Energy and several Chinese journals. He is the founding Chair of IEEE Conference on Energy Internet and Energy System Integration (EI2). His research interests include Energy Management System, System-wide Automatic Voltage Control, Energy Internet and Energy System Integration. He was awarded the second-class prize of China National Technology Innovation Award for his contribution on development of new generation of energy management system. He has published more than 400 peer-reviewed papers and 4 books. He has been authorized more than 10 US Patents of Invention and 100 Chinese Patents of Invention.

THURSDAY, MAY 23

Keynote Session IV

Chaired by Zhenyuan Zhang



Jianhui Wang

Editor-in-Chief of the IEEE Transactions on Smart Grid
IEEE PES Distinguished Lecturer
Southern Methodist University

Speech Title: Grid Modernization: Challenges, Opportunities, and Solutions

Abstract: Our aging grid infrastructure faces increasing challenges from multiple sources including greater demand variability, stricter environmental regulations and growing cyber security concerns. Advanced smart grid technologies provide possible solutions to tackle these challenges. Meanwhile how to best utilize these new devices and technologies such as PMUs and electric vehicles remains a challenge by itself. In this talk, I will address various topics which span a multitude of areas including demand response, stochastic optimization for renewable integration, microgrids and cyber security. I will present the technical issues in implementing these technologies and corresponding potential solutions.

BIO: Dr. Jianhui Wang is an associate professor at Southern Methodist University. Prior to joining SMU, Dr. Wang had an eleven-year stint at Argonne National Laboratory with the last appointment as Section Lead – Advanced Grid Modeling. He is the Secretary of the IEEE Power & Energy Society (PES) Power System Operations, Planning & Economics Committee. Dr. Wang is the Editor-in-Chief of the *IEEE Transactions on Smart Grid* and an IEEE PES Distinguished Lecturer. He is also a Clarivate Analytics highly cited researcher for 2018.

THURSDAY, MAY 23

Keynote Session IV

Chaired by Zhenyuan Zhang



Bingyin Xu

Director of Smart Grid Research Center of Shandong University of Technology
The Chairman of the board of Kehui Power Automation Ltd.

Speech Title: Developments of Earth Fault Protection for Non-solidly Earthed Networks

Abstract: In the absence of a more reliable method, many utilities in China still use manual switching to identify faulty feeders in medium voltage networks with non-solidly earthed neutrals (i.e. fully isolated or Peterson coil compensated networks). There is therefore an urgent need for a reliable earth fault detection technique to improve supply quality and protect networks from long duration over voltages. Most earth fault protections in use today are based on steady state power frequency or harmonic components. The field performance of these systems has been far from satisfactory due to weak and unstable fault currents. For many years it has been realized that transient based earth fault protection could overcome the problems encountered by steady state methods because transient fault currents have much higher magnitude than steady state values and are largely unaffected by the presence/absence of Peterson coils. Transient methods were first proposed in the early 1950s in Germany and compared the initial polarities of zero sequence voltage and current. No significant progress in the use of transient techniques was then reported until the late 1990s when modern microelectronics, and high speed data acquisition and processing, provided the opportunity to develop new transient protection techniques. New developments in transient based earth fault protection are introduced. Practical experiences with the application of transients based on earth fault protection in China are presented.

BIO: Prof. Xu Bingyin received Bachelor and Master Degrees on power system automation from Shandong University, China, in 1982 and 1987 respectively, and was awarded Ph.D of power system automation of Xi'an Jiaotong University, China, in 1991. He studied in The City University, UK, from Oct. 1988 to Oct., 1990 as part of split-Ph.D training program. He is a member of technical committee of CIRED Chinese national committee, and a member of WG17 (Use of IEC61850 for distributed energy resources and distribution automation) of IEC TC 57. His research interests are fault location and monitoring of power lines, distribution automation and protection as well as smart distribution grids.

Keynote Session IV

Chaired by Zhenyuan Zhang



Tapan Saha

IEEE Fellow
IEEE PES Distinguished Lecturer
Director of Australasian Transformer Innovation
Centre University of Queensland

Speech Title: Challenges and opportunities of Solar PV integrations to national grids

Abstract: Many countries are promoting renewable energy generations to address climate change and to reduce carbon emissions. Among them, solar photovoltaic (PV) is making significant proliferations in both distribution and transmission networks. Solar PV generation is variable and hence they bring many challenges for network and overall energy management. At the University of Queensland, our research team has been involved in a number of solar PV projects, which are progressing towards addressing some of the major challenges the electricity industry is currently facing. This keynote speech will present some key outcomes from our research projects to address the challenges and opportunities from PV integrations.

BIO: Tapan Saha received his PhD from the University of Queensland (UQ), Brisbane, Australia in 1994. Previously, Tapan obtained a B. SC in Electrical & Electronic Engineering from Bangladesh University of Engineering and Technology (BUET), Dhaka in 1982 and a Master of Technology in Electrical Engineering from Indian Institute of Technology, New Delhi in 1985. He has been with the University of Queensland since 1996, where he has been a Professor of Electrical Engineering since 2005. Currently he is an Adjunct Professor of Xi'an Jiao Tong University in China. Previously he worked in James Cook University of North Queensland, Townsville for two and a half years and in BUET for three and a half years. Currently he is the Leader of the Power & Energy Systems Research Group, Director of Australasian Transformer Innovation Centre & Leader of UQ Solar. He is a Fellow of IEEE and a Fellow and CPEng of Institution of Engineers Australia. He is an IEEE Power & Energy Society Distinguished Lecturer. Tapan has successfully supervised 40 PhD students as the principal supervisor. He has received extensive funding from Australian competitive agencies, state and federal governments and electricity industry. He has published more than 500 papers in IEEE, IET & Elsevier Journals and peer reviewed conferences.

THURSDAY, MAY 23

Technical Sessions

13:30-15:30 | THURSDAY, MAY 23

TS13- Grid Operation and Management -VI

Session Chair: Yang Han, University of Electronic Science and Technology of China

Venue: Chamber of Dew (浣花轩)

THURSDAY, MAY 23

Time	Paper ID	Title & Authors
13:30~13:45	584	Operating Overvoltage Simulation Research of ± 800 kV UHVDC Transmission Converter DC Yard Caused by Typical Grounding Fault <i>Hao Zhang, Yapei Liu, Yujing Guo, Yongqi Yao, Zhijun Wang, Bo Zhang and Yingqian Du</i> Pinggao Group Co., Ltd, China
13:45~14:00	586	Influence of Nozzle Expansion Angle on the Breaking Performance of Ultra-high Voltage SF6 Circuit Breaker <i>Hao Zhang, Yujing Guo, Yongqi Yao, Zhijun Wang, Bo Zhang, Yapei Liu and Yingqian Du</i> Pinggao Group Co., Ltd, China
14:00~14:15	587	Optimal Design of 535kV High Speed Mechanical Switch Pin Based on MAXWELL and LS-DYNA <i>Zhigang Wang, Yapei Liu, Yongqi Yao, Hao Zhang, Zhijun Wang, Bo Zhang, Yingqian Du</i> Pinggao Group Co., Ltd, China
14:15~14:30	588	Optimal Active Power Control of AGC Considering High-Penetration EVs <i>Kaiwen Zeng, Jianning Liu, Xiangzhen He, Dezhi Wang, Lefeng Cheng, Tao Yu, Xinlei Cai, Pengyu Di and Jiaming Li</i> Power Dispatching Control Center of Guangdong Power Grid Co., Ltd., China
14:30~14:45	608	Component Importance Indices of Transmission Systems Based on The Impact-increment Based State Enumeration Method <i>Yong Zhang, Bengang Wei, Zhaojie Liu, Tangyun Xu, Xiaonan Liu and Kai Hou</i> Tianjin University, China
14:45~15:00	620	Optimal PMU Placement for the Distribution System Based on Genetic-Tabu Search Algorithm <i>Quan Xu, Li Yu, Yuting Wang, Xiangyu Kong and Xiaoxiao Yuan</i> Electric Power Research Institute China Southern Power Grid Company Limited, China
15:00~15:15	805	Structural Dynamics Simulation and Engineering Application Analysis of 550kV GIL <i>Yingqian Du, Zhijun Wang, Yapei Liu, Yongqi Yao, Tianshuo Yin, Bo Zhang, Hao Zhang</i> Pinggao Group Co., Ltd, China

TS14- Emerging Technologies and End-user Systems-III

Session Chair: Binyu Xiong, Wuhan University of Technology

Venue: Chamber of Dialogue (相语堂)

Time	Paper ID	Title & Authors
13:30~13:45	427	Electromagnetic Transient Simulation Analysis for the 500 kV Saturated Iron-Core Superconducting Fault Current Limiter <i>Mengze Yu, Haifeng Hong and Huixiang Chen</i> China Southern Power Grid, China
13:45~14:00	438	STATCOM Based Network Voltage Unbalance Mitigation for Sub-Transmission Networks <i>Thisandu Kahingala, Sarath Perera, Upuli Jayatunga and Ashish Agalgaonkar</i> University of Wollongong, Australia
14:00~14:15	442	Technical and Economic Analysis of Aluminum Conductor with Multi-stranded Composite Core and Its Application <i>Xuzhu Dong, Ruihai Li, Yongli Liao, Jinqiang He, Bo Gong, Lingmeng Fan, Dannan Zheng, Weizhuo Chen, Yan Zhu, Qingming Wang and Zhengmin Zhou</i> Electric Power Research Institute, China Southern Power Grid Co., Ltd, China
14:15~14:30	449	An Optimal Operational Strategy for Vanadium Redox Flow Battery Based on Particle Swarm Optimization <i>Binyu Xiong, Zirui Wang, Kun Qin, Jizhong Chen and Juyi Mu</i> Wuhan University of Technology, China
14:30~14:45	467	Equivalent Modeling of Power Electronic Transformer in AC-DC hybrid system <i>Wenzhi Zhao, Jinghong Zheng and Zeming Zheng</i> Tsinghua University, China
14:45~15:00	474	Residual Capacity Estimation of Valve-regulated Lead-acid (VRLA) Batteries for Second-use <i>Zhirui Liang, Zhengxiang Song, Jianhua Wang, Guogang Zhang and Xian Wang</i> Xi'an Jiaotong University, China
15:00~15:15	549	Optimal Dispatching Strategy of Load Aggregators Considering Peak Load Shifting <i>Ying Wei, Zhihao Yang and Haoming Liu</i> Hohai University, China
15:15~15:30	572	Dynamic Feeder Reconfiguration in Automated Distribution Network Integrated with Renewable Energy Sources with Respect to the Economic Aspect <i>Ali Azizvahed, Hossein Lotfi, Mojtaba Jabbari Ghadi, Sahand Ghavidel, Li Li and Jiangfeng Zhang</i> University of Technology Sydney, Australia

TS15- Grid Operation and Management -VII

Session Chair: Min Sun, University of Electronic Science and Technology of China

Venue: Chamber of Peony (牡丹亭)

Time	Paper ID	Title & Authors
13:30~13:45	288	Adaptability analysis of distance protection on the transmission lines emanating from renewable power generators <i>Yu Fang, Ke Jia, Zhengxuan Zhu, Tao Feng, Zhe Yang and Bohan Liu</i> North China Electric Power University, China
13:45~14:00	298	Two-Stage Topology Identification Method for Distribution Network Via Clustering Correction <i>Ye Chen, Jinming Chen, Hao Jiao, Yajuan Guo, Wei Jiang and Haibo Tang</i> State Grid Jiangsu Electric Power Company Electric Power Research Institute, China
14:00~14:15	300	Estimation of Power System Inertia Using System Identification <i>Vasupalli Sagar and Sachin Kumar Jain</i> PDPM-IIITDM Jabalpur, India
14:15~14:30	305	Analysis of Influence Factors on the Transmission Capability of the Yu-e Back-to-back VSC-HVDC South Channel <i>Yu Xiaodong, Tang Zeyang and Cao Kan</i> Electric Power Research Institute, State Grid Hubei Electric Power Co, Ltd, China
14:30~14:45	320	An Optimal Control Strategy of Staggered Coordinated Recovery of Multi-infeed HVDC Systems <i>Weiping Liao, Rui Zhou, Kun Xie and Yan Zhang</i> Guangdong Power Grid Co., Ltd. Jiangmen Power Supply Bureau, China
14:45~15:00	321	A Two-steps Splitting Strategy Based on Laplacian Eigenmap Algorithm For Large Power Grid With Power Wind Connected <i>Mengjiao Qing and Fei Tang</i> Wuhan University, China
15:00~15:15	327	Transient Stability Analysis of AC/DC System Considering Electromagnetic Transient Model <i>Qi Tao, Yusheng Xue and Chenhao Li</i> Zhejiang University, China
15:15~15:30	333	Asynchronous Distributed Dynamic Economic Dispatch in Active Distribution Networks <i>Tong Xu, Wenchuan Wu, Qiuyu Lu, Yu Zhu and Jiaqi Chen</i> Tsinghua University, China

TS16- Renewable Generation and Distributed Energy Resources Integration-III

Session Chair: Xiao Xu, University of Electronic Science and Technology of China

Venue: Chamber of Blossom (梅兰阁)

Time	Paper ID	Title & Authors
13:30~13:45	306	Optimal Operation of Distribution Network with Distributed Wind Power Efficient Consumption Accounting for Demand Response <i>Qian Sun, Jiandong Duan and Wenchao Lu</i> Xi'an University of Technology, China

13:45~14:00	318	Single-stage Grid-connected Photovoltaic Generation Takes Part in Grid Frequency Regulation for Electromechanical Transient Analysis <i>Gangui Yan, Wenbo Hu, Qi Jia and Shanfeng Zhang</i> Northeast Electric Power University, China
14:00~14:15	377	Research on Control Strategy of Improved Virtual Synchronous Generator for Improving the Operating Capability of Passive Isolated Islands <i>Yuhong Wang, Lan Luo and Tianze Li</i> Sichuan University, China
14:15~14:30	385	A Corrective Control Approach for Combined Heat And Power System integrated with Multiple Energy Storage System <i>Qunli Lin, Xinwei Shen, Yong Sun, Zhenyuan Li, Qinglai Guo and Hongbin Sun</i> Tsinghua University, China
14:30~14:45	396	Research on Comprehensive Assessment System of Park Integrated Energy System <i>Junfeng Liu, Kai Yuan, Yin Xu, Yi Song, Chongbo Sun, Xianing Jin and Danlei Hu</i> Beijing Jiaotong University, China
14:45~15:00	419	Chance-Constrained Shrunk-Primal-Dual Subgradient (CC-SPDS) Approach for Decentralized Electric Vehicle Charging Control <i>Mingxi Liu and Mostafa Sahraei-Ardakani</i> University of Utah, United States
15:00~15:15	428	Optimal Scheduling Method for Electrical-Thermal Integrated Energy System Considering Heat Storage Characteristics of Heating Network <i>Bo Zhao, Xuesong Zhang, Chouwei Ni, Yunfei Mu, Mingjun Wang and Xianjun Meng</i> Tianjin University, China
15:15~15:30	102	Long-Term Electricity Price Forecast Using Machine Learning Techniques and New Feature Discovery <i>Ashkan Yousefi, Omid Ameri and Dean Sharafi</i> Victoria University, Australia

Technical Sessions

16:00-18:00 | THURSDAY MAY 23

TS17- Grid Operation and Management -VIII

Session Chair: Yuefang Du, University of Electronic Science and Technology of China

Venue: Chamber of Dew (浣花轩)

Time	Paper ID	Title & Authors
16:00~16:15	653	Research on overspeed protection control strategies of PWR nuclear power units <i>Libin Wen, Wei Sheng and Zheng Xu</i> Zhejiang University, China

16:15~16:30	670	General Design Research of Intelligent Substation Equipment Interface Based on Modular Construction <i>Gaiping Shi, Jinsong Hu, Bin Chen, Yinzhong Wei, Xiangyu Kong and Jingtao Yao</i> State Grid Economic and Technological Research Institute Co., Ltd., China
16:30~16:45	676	Research on the Vibration Characteristics of GIS/GIL Bushbar <i>Zhijun Wang, Yujing Guo, Yongqi Yao, Yingqian Du, Hao Zhang, Yapei Liu and Bo Zhang</i> PINGGAO GROUP., LTD, China
16:45~17:00	678	Research on Parameter Correction of Frequency Situation Estimation Model <i>Yanyang Fu, Jianbo Yi, Yufei Teng, Zhuohui Guo and Qi Huang</i> University of Electronic Science and Technology of China
17:00~17:15	692	Comparative analysis of external characteristics of nuclear power units and thermal power units <i>Libin Wen, Wei Sheng and Zheng Xu</i> Zhejiang University, China
17:15~17:30	694	Design Method for the Reinforcement Scheme of the Typical Regional Power Grid with High Proportion of Renewable Energy using VSC-HVDC Technology <i>Guangzeng You, Xinglong Wu, Lingfang Li, Xinchun Zhu, Liang Xiao, Jian Yang and Zheng Xu</i> Zhejiang University, China
17:30~17:45	722	Effect of Different Activation Function on Short Term Load Forecasting Using Neural Network- A Comparative Study <i>Rajni Kumari and Sachin Kumar Jain</i> IIITDM Jabalpur, India

TS18- Emerging Technologies and End-user Systems-IV
Session Chair: Hao Quan, Nanjing University of Science and Technology
Dipti Srinivasan, National University of Singapore
Venue: Chamber of Dialogue (相语堂)

Time	Paper ID	Title & Authors
16:00~16:15	613	Optimal Configuration of Energy Storage Capacity in Multi-energy System with Temperature Control Equipment Based on Discrete Fourier Transform <i>Shuocheng Wang, Bo Hu, Kaigui Xie, Jiahao Yan, Yanlin Li, Huawei Chao and Yi Zeng</i> Chongqing University, China
16:15~16:30	619	Planning of Central Energy Station in Community Integrated Energy System with Electrical and Heat Storage Devices <i>Li Yu, Jinyong Lei, Xiaobin Guo, Peng Li, Cheng Li, Guanyu Song and Yusheng Wu</i> Tianjin University, China
16:30~16:45	705	Control Strategies for Energy Optimization of HVAC Systems in Small Office Buildings using EnergyPlus <i>Mubashir Hussain Wani, Akshya Swain and Abhisek Ukil</i> The University of Auckland, New Zealand
16:45~17:00	706	Decentralized MPC-Based Frequency Control of Networked Microgrids <i>Kun Liu, Tao Liu and David Hill</i> The University of Hong Kong, China

17:00~17:15	713	A Frequency Control Strategy Using Electric Vehicles Considering Travelling Demand <i>Chenglin Li, Zheng Xu, Yu Zhou, Wanqing Chen and Xianjun Meng</i> Tianjin University, China
17:15~17:30	715	Interaction Characteristics of Ports of PET in AC/DC Hybrid System under Large Disturbances <i>Zonghang Han, Jinghong Zheng, Wenzhi Zhao and Zeming Zheng</i> Tsinghua University, China
17:30~17:45	734	Influence Analysis of Droop Coefficients on Load Margins for AC/DC Hybrid Microgrids <i>Lei Pang, Bei Han, Keyou Wang, Guojie Li, Haijun Liu and Shihui Yang</i> Shanghai Jiao Tong University, China
17:45~18:00	335	Stable Segment Method for Multiple Linear Regression on Baseline Estimation for Smart Grid Fast Automated Demand Response <i>Shun Matsukawa, Chuzo Ninagawa, Junji Morikawa, Takashi Inaba and Seiji Kondo</i> Gifu University, Japan

TS19- Grid Operation and Management -IX

Session Chair: Jinquan Zhao, Hohai University

Venue: Chamber of Peony (牡丹亭)

Time	Paper ID	Title & Authors
16:00~16:15	334	Distributed Economic Dispatch for Active Distribution Networks with Virtual Power Plants <i>Qiuyu Lu, Tong Xu, Yinguo Yang, Wenchuan Wu, Yu Zhu and Jiaqi Chen</i> Tsinghua University, China
16:15~16:30	337	Topology Modeling Method for Distribution Network via Power Line Communication <i>Jun Ying, Mingxiang Liu, Yalou Chen, You Yue, Wenlu Ji and Ming Zhang</i> NARI Group Co., Ltd. (State Grid Electric Power Research Institute), China
16:30~16:45	359	The Study and Application of Security Control Plan Incorporating Frequency Stability (SCPIFS) in CPS-Featured Interconnected Asynchronous Grids <i>Yuqi Han, Wentao Zhang, Jun Wei, Xuna Liu and Shengyong Ye</i> State Grid Sichuan Economic Research Institute, China
16:45~17:00	361	Analysis and Treatment of 220kV Main Transformer Insulating Cylinder Discharge Failure <i>Tianshi Wang</i> Liaoning Shihua University, China
17:00~17:15	376	Fault Diagnosis of HVDC System Based on Wavelet Entropy Clustering and Evidence Fusion Theory <i>Yuhong Wang and Keqiang Tai</i> Sichuan University, China
17:15~17:30	390	Economical Operation Optimization of Distribution Network Considering Multiple Adjustment Measures <i>Zhou Jiancong, Hu Taotao, Liao Lijuan, Gao Hongxia, Hu Jiajia, Wang Hui, Wang Jiayi, Shi Wenchao and Liu Jinyuan</i> Sichuan University, China

TS20- Renewable Generation and Distributed Energy Resources Integration-IV

Session Chair: Miao Yu, Zhejiang University

Venue: Chamber of Blossom (梅兰阁)

Time	Paper ID	Title & Authors
16:00~16:15	450	Chance-Constrained DG Hosting Capacity Assessment With Spatially Correlated Wind Speed <i>Han Wu, Ruanming Huang, Yuefeng Wang and Yue Yuan</i> Hohai University, China
16:15~16:30	466	Stability Analysis and Compensator Design for PV Generators Based on Describing Function Method <i>Jianing Liu, Yanghong Xia, Miao Yu and Wei Wei</i> Zhejiang University, China
16:30~16:45	471	A MILP Production Costing Method Realizing Environmental Benefits of Wind Power <i>Jiao Du, Yueyue Li, Shunbo Lei, Yujia Li and Yunhe Hou</i> The University of Hong Kong, Hong Kong
16:45~17:00	491	Comparative Study of EKF and UKF for SOC Estimation of Lithium-ion Batteries <i>Tian Xiao, Xiaohan Shi, Boxi Zhou and Xiaolei Wang</i> Shandong University, China
17:00~17:15	499	An Optimal Three-Phase Power Control Method of Distribution Network Based on Split-Phase SNOs <i>Lei Chao</i> State Grid Sichuan Electric Power Company Tianfu Power Supply Company, China
17:15~17:30	501	Impact of Frequency-Responsive Wind Turbines on Power System Stability <i>Li Sun, Yanfeng Ge, Dong Wang and Yunhe Hou</i> The University of Hong Kong, Hong Kong
17:30~17:45	504	Optimized operating strategy for a distribution network containing BESS and renewable energy <i>Ke Qing, Qi Huang, Shuheng Chen, Weihao Hu and Jun Wang</i> University of Electronic Science and Technology of China, China
17:45~18:00	525	Frequency Control Strategy of Grid-connected PV System Using Virtual Synchronous Generator <i>Wenfeng Li, Hui Wang, Yuan Jia, Suxiang Yang and Haoming Liu</i> Hohai University, China

THURSDAY, MAY 23

Special Sessions

13:30-15:30 | THURSDAY MAY 23

SS05- Complementary and Coordinated Planning, Operation and Control of Multi-Energy Systems-I

Session Chairs: Weisheng Wang, China Electric Power Research Institute

Wei Hu, Tsinghua University

Gangui Yan, Northeast Electric Power University

Venue: Chamber of Mist (攀雨阁)

Time	Paper ID	Title & Authors
13:30~13:45	967	Transformer Fault Diagnosis Analysis Using Deep Neural Network <i>Hossein Mehdipourpicha, Rui Bo, Haotian Chen, Jie Huang and Fengkai Hu</i> Missouri University of Science and Technology, United States
13:45~14:00	304	Energy decomposition of long and middle term contract in multi-energy system <i>Yongxi Huang, Xiuli Wang, Wei Zhang and Chunlian Cao</i> Xi'an Jiaotong University, China
14:00~14:15	362	Study of Typical Scenarios of Wind Power Based on Data Dimension Reduction and Affinity Propagation Clustering <i>Jiachen Li, Lin Ye and Qingzhi Zhai</i> China Agricultural University, China
14:15~14:30	451	Design and Implementation of Intelligent Dispatching Operation Strategy Platform for Power Grid with UHV <i>Fucai Li, Tao Cheng, Qiuting Guo, Yuchen Qi and Wei Hu</i> Tsinghua University, China
14:30~14:45	453	Complementary Coordinated Dispatch of Multi-energy Systems Considering Power Flexibility Margin <i>Bai Xiao, Zhiwen Xiao, Zhuo Jiang, Ling Dong, Maochun Wang, Hongzhi Yang and Gangui Yan</i> Northeast Electric Power University, China
14:45~15:00	458	Short-term Optimized Operation of Multi-energy Power System Based on Complementary Characteristics of Power Sources <i>Bai Xiao, Jia Zheng, Yonggang Shi, Mingxi Jiao, Yao Wang, Ling Dong, Maochun Wang, Hongzhi Yang and Gangui Yan</i> Northeast Electric Power University, China
15:00~15:15	476	A Novel Strategy for Wind-Solar-Hydro Complimentary Real-time Scheduling and Control <i>Hao-Tian Zhang, Haohao Wang, Yujie Ding and Ning Wang</i> State Grid Electric Power Research Institute (NARI), China
15:15~15:30	517	Complementarity Analysis and Evaluation of Renewable Energy Stations based on Mixed-Copula Model <i>Jiahao Wan, Quanfu Zheng, Ming Xiao, Xuebin Wang, Hao Su and Donghan Feng</i> Shanghai Jiao Tong University, China

THURSDAY, MAY 23

SS06- Uncertainty Handling Techniques for Smart Grid

Session Chairs: Hao Quan, Nanjing University of Science and Technology

Anurag Sharma, Newcastle University in Singapore

Venue: Chamber of Lotus (芙蓉居)

Time	Paper ID	Title & Authors
13:30~13:45	363	Probabilistic Load Flow Using an Improved Point Estimate Method Considering Wind Generation <i>Yulong Che, Xiaoqin Lv, Xiaoru Wang, Jianyun Liu and Yu Zhang</i> School of Electrical Engineering, Southwest Jiaotong University, China
13:45~14:00	413	Short-term Load Forecasting Approach with SVM and Similar Days Based on United Data Mining Technology <i>Xuna Liu, Wentao Zhang, Shengyong Ye and Yuqi Han</i> State Grid Sichuan Economic Research Institute, China
14:00~14:15	632	Price Setting of a Microgrid Operator in a Radial Distribution Network <i>Bala Sai Kiran Patnam and Naran M Pindoriya</i> Indian Institute of Technology Gandhinagar, India
14:15~14:30	671	Distributed Interactive Reactive Power and Voltage Control for AC/DC Hybrid Distribution Network <i>Wei Liu, Jianbin You, Minghui Yin, Hucheng Li, Liudong Zhang and Chaoming Wang</i> Nanjing University of Science and Technology, China
14:30~14:45	750	Cost-Effective Energy Management of Grid-Connected PV and BESS: A Case Study <i>Sachinkumar Suthar, Nitish Kumar and Naran M. Pindoriya</i> Indian Institute of Technology Gandhinagar, India
14:45~15:00	902	Research on Harmonic Influence of Electric Vehicle Wireless Charging System on Power Grid <i>Feng Wen, Qiang Li, Li Liu, Tao Wu and Rui Li</i> NanJing University of Science and Technology, China

SS07- Power Electronic Interface for Smart DC Microgrids

Session Chair: Fujin Deng, Southeast University

Venue: Brocade City Hall-1,2 (锦城 1、2 厅)

Time	Paper ID	Title & Authors
13:30~13:45	399	AC Side Impedance Modeling of Grid-Tied Modular Multilevel Converter Using Double Closed Loop Control Strategy <i>Cheng Zeng, Xiong Du, Jun Zhang and Chengmao Du</i> Chongqing University, China
13:45~14:00	513	Interleaved Hybrid Boost Converter with Switched Capacitor Technique <i>Mahadevan Bhaskar, Girish Ganesan R and Narayanan K</i> Nanyang Technological University, Singapore
14:00~14:15	598	Design and Implementation of Droop Control Strategy for DC Microgrid Based on Multiple DC/DC Converters <i>Yuxiong Liu, Yang Han, Chengjia Lin, Ping Yang and Congling Wang</i> University of Electronic Science and Technology of China, China

14:15~14:30	605	An Improved Droop Control Method for DC Microgrids with Droop Coefficient Correction and DC Bus Voltage Restoration <i>Luqiao Li, Yang Han, Ping Yang, Qi Huang, Zhenyuan Zhang and Yan Xu</i> University of Electronic Science and Technology of China, China
14:30~14:45	677	Simulation and Analysis of Multilevel DC Transformer Using Different Dual-Active-Bridge DC-DC Converter Models <i>Yanhui Qin, Kaike Wang, Zhendong Tan, Yue Xia, Ying Chen and Yankan Song</i> Tsinghua University, China
14:45~15:00	748	A Three-Phase Hybrid Four-Level Rectifier <i>Jianfei Chen, Fujin Deng, Qian Heng and Caisheng Wang</i> Southeast University, China
15:00~15:15	798	Preliminary Experiments of a Cryogenic Boost Chopper Based on Low-Resistance MOSFETs and Zero-Resistance ReBCO Inductor under 77K <i>Yu Chen, Xiao-Yuan Chen and Hua-Yu Gou</i> Sichuan Normal University, China
15:15~15:30	977	A Three-Phase Four-Level Rectifier with Reduced Component Count <i>Jianfei Chen, Fujin Deng, Qiang Yu and Yulin Zhong</i> Southeast University, China

Special Sessions

16:00-18:00 | THURSDAY MAY 23

SS08- Complementary and Coordinated Planning, Operation and Control of Multi-Energy Systems-II

Session Chairs: Weisheng Wang, China Electric Power Research Institute

Wei Hu, Tsinghua University

Gangui Yan, Northeast Electric Power University

Venue: Chamber of Mist (攀雨阁)

Time	Paper ID	Title & Authors
16:00~16:15	239	Capacity Assessment of Flexibility Retrofits for Coal Power Units to Promote Renewable Energy Accommodation <i>Xiaofei Li, Yuehui Huang, Weichun Ge, Huanhuan Luo and Guiping Zhou</i> China Electric Power Research Institute, China
16:15~16:30	542	Capacity Co-Optimization of Thermal and Battery Energy Storage System in Multi-energy Complementary System <i>Pai Li, Yuehui Huang, Wannian Qi and Jiatian Gan</i> China Electric Power Research Institute, China
16:30~16:45	575	Integrated Energy Collaborative Optimal Dispatch Considering Energy Flexible Building in Smart grid <i>Peiqiang Li, Chengyu Zeng, Zuoyun Tan, Xuqiong Yang and Piao Xu</i> Hunan University, China

16:45~17:00	856	<p>Optimal Planning of Multi-Carrier Energy Hub System Using Particle Swarm Optimization</p> <p><i>Toshiya Nanahara, Kenichi Kawabe, Hamdy Hassan and Alaa Farah</i></p> <p>Tokyo Institute of Tecnology, Japan</p>
17:00~17:15	900	<p>Optimization Operation of Multi-energy Complementary System based on Interval Model</p> <p><i>Yuan Li</i></p> <p>NARI, China</p>
17:15~17:30	905	<p>Capacity Allocation Optimization of Components in Regional Integrated Micro-energy System</p> <p><i>Hui Hui, Ming Xin Zhao and Jian Su</i></p> <p>China Electric Power Research Institute (CEPRI), China</p>

Poster Sessions

13:30~18:00 | THURSDAY, MAY 23

Poster Session III		
Venue: Jinjiang Hall		
Time: 13:30-15:30		Session Chairs: Yufei Teng, State Grid Sichuan Electric Power Research Institute Di Cao, University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
1	121	A Power Spot Market Model and Construction Path Considering Demand Response <i>Changyong Lin, Yi Du, Shengzhou Ke, Kangli Xiang, Yang Yi and Yuanfei Li</i> Economic and Technology Research Institute, State Grid Fujian Electric Power Company, China
2	173	Research on the Electricity Market Clearing Model and Price Fluctuation with Wind Power <i>Peizheng Xuan, Jizhong Zhu, Zou Jin and Pingping Xie</i> Electric Power Research Institute of CSG, china
3	222	The Day-ahead Optimization Scheduling of CCHP Energy System with Multi-mode Energy Storages <i>Wei Hu, Xiao Lu, Jiangping Jing, Jinran Wang, Haixiang Zang and Zhinong Wei</i> Hohai University, CHINA
4	284	From Uncertainty Elimination to Profit Enhancement: Role of Data in Demand Response <i>Bohong Wang, Qinglai Guo and Tianyu Yang</i> Tsinghua University, China
5	307	Analysis on Construction and Development of Hubei Electricity Sale Market <i>Defu Cai, Wenna Wang, Kunpeng Zhou, Bingke Yan, Li Wan, Chu Zhou, Yuchuan Hu, Xiaodong Yu and Ying Wang</i> State Grid Hubei Electric Power Research Institute, China
6	329	Simulation and Analysis of Centralized Bidding Market Clearing Method Based on Intelligent Algorithm <i>Long Huang and Haoyong Chen</i> School of Electric Power, South China University of Technology, China
7	366	Economic Dispatch and Frequency-regulation Reserve Capacity Integrated Optimization for High-penetration Renewable Smart Grids <i>Hong-Tzer Yang, Yi-Syuan Wu and Jian-Tang Liao</i> National Cheng-Kung University
8	381	Experimental Analysis of Equilibrium of Long-term Market Clearing Mechanism in China <i>Jingyi Shang, Haoyong Chen, Ke Shi, Xin Jiang and Jinfeng Gao</i> Zhengzhou University, China

THURSDAY, MAY 23

Time: 13:30-15:30		Session Chairs: Yufei Teng, State Grid Sichuan Electric Power Research Institute Di Cao, University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
9	502	Construction and Enlightenment of Japan's New Electricity Market <i>Yumeng Liu and Haoyong Chen</i> School of Electric Power, South China University of Technology, China
10	520	A Robust Operation Strategy for Energy Storage Considering Uncertainty in Electricity Price <i>Jingyi Shang, Xin Jiang, Wenqian Yin, Yunhe Hou, Zhihao Yang and Haoming Liu</i> Hohai University, China
11	562	Application of Two-Stage Feature Selection Technique in Power Load Forecasting Considering Delayed Effect <i>Min Liu, Weifeng Liu, Yidan Xu, Peng Wang and Dengke Wang</i> Guizhou University, China
12	609	Two-stage Optimization Method for Medium and Long-term Electric Quantity Security Check <i>Lili Li, Li Chang, Junfeng Yang and Xiaoyu Zheng</i> NARI Group, China
13	647	Marketing Models and Value-added Services of Power Grid Enterprises in Chinese Electricity Market Environment <i>Jianfu Chen, Yuanji Cai, Jianbiao Li, Yao Liu and Xingyu Pei</i> Tsinghua University, China
14	652	Shapley Value based Customers Voluntary Demand Response Program: A Stackelberg Game Approach <i>Jun Wang, Qi Huang, Weihao Hu, Jian Li, Zhenyuan Zhang, Dongsheng Cai, Xiaoyuan Zhang, Xianbo Wang and Changhai Li</i> University of Electronic Science and Technology of China, China
15	667	Wind Power Prediction Based on Principal Component Analysis and Long Short-Term Memory Networks <i>Weiming Lang, Xiangjin Ma, Yanhong Luo, Bowen Zhou and Dongsheng Yang</i> Northeastern University, China
16	719	Intra-day Multi-sequential Generation Schedule Considering Energy Storage System <i>Zhi Cai, Qiang Ding, Sai Dai, Yanfeng Ge, Songjie Shi and Jiawei Huang</i> China Electric Power Research Institute, China
17	887	Research on Lean Management of Power Marketing Strategy in Power Grid Enterprises <i>Chao Sun, Yingjie Zang, Jingwen Sun and Yanbo Liu</i> Shenyang Institute of Engineering, China
18	172	Uncertainty Handling in Electricity Market Operations <i>M Saboor-Ui-Haseena, Pranjal Pragya Verma, Wenjie Zhang, Hao Quan and Dipti Srinivasan</i> Nanjing University of Science and Technology, China

Time: 13:30-15:30		Session Chairs: Yufei Teng, State Grid Sichuan Electric Power Research Institute Di Cao, University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
19	785	Economic Analysis of User-end Grid Connected Energy Storage System Based on the Sensitivity Analysis of Battery Price <i>Geng Niu, Ming Wu, Lingfeng Kou, Xiaogang Hou, Xiaoyun Qu, Lijing Sun and Yijin Li</i> China Electric Power Research Institute, China
20	815	Priority Rules on the Charging of Electric Vehicles with Energy Storage <i>Jiangliang Jin and Yunjian Xu</i> Chinese University of Hong Kong, China
21	996	Electricity Consumption and Weather Reflect Macro-Economic Status <i>Xin Wu, Haotian Chang, Jian Li, Qi Huang and Zhenyuan Zhang</i> UESTC, China
22	535	Capacity Optimization of Battery Energy Storage System in Multi-energy Complementary System Based on Time Series Simulation Method <i>Yuehui Huang, Pai Li, Weisheng Wang and Ling Dong</i> China Electric Power Research Institute, China
23	323	Optimization Strategy for Generator Excitation System Adjustment Coefficient based on High Energy Consumption Load accessed to the Power Grid <i>Xiaohu Liang, Ruojin Li, Zhuang Cai and Yongsheng Jin</i> North China Electric Power University, China
24	735	Design and Research on Electricity Market Operation System in Southern Region <i>Xiaojuan Wang, Haoyong Chen and Long Huang</i> School of Electric Power, South China University of Technology, China
25	12	Real-Time Economic Dispatch and Subinterval Coordination Strategy to Benefit System Operations <i>Chenghui Tang, Fan Zhang and Zheng Zhao</i> State Grid Energy Research Institute CO., LTD., China
26	16	Power Optimization Strategy for Typical Industrial Users under the Condition of Time-of-use Pricing <i>Gang Wang, Xiaohui Zeng, Chen Yang, Yichen Xu, Peng Nan and Leijiao Ge</i> State Grid Xinjiang Electric Power Company Electric Power Research Institute, China
27	28	Optimization of Micro-grid Dispatching Based on Adaptive Chaos Particle Swarm Optimization <i>Ning Li, Xianwu Shan, Lu Heng, Yongping Ren, Hongwei Pan and Leijiao Ge</i> State Grid Xinjiang Electric Power Company Electric Power Research Institute, China
28	33	Stability Analysis of a DC Distribution System for Integration of Plug-In Electric Vehicles <i>Zhiyu Wei, Ke Peng and Jiajia Chen</i> Shandong University of Technology, China

Time: 13:30-15:30		Session Chairs: Yufei Teng, State Grid Sichuan Electric Power Research Institute Di Cao, University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
29	85	Research on Characteristics of Separation Repair Technology of Magnetic Shield <i>Tingting Luo, Zhiqiang Yang, Fei Ao, Dun Liu and Wanneng Zhu</i> Hunan University, China
30	93	Energy Savings Using Direct Current (DC) from Photovoltaic (PV) System in a Residential Home <i>Yunzhe Luo and Tek Tjing Lie</i> Auckland University of Technology, New Zealand
31	110	Air Conditioning Cooling Power Prediction of Provincial Residents Based on Regional Comprehensive Temperature <i>Kangli Xiang, Bojian Chen, Xiaohan Yu, Du Yi, Changyong Lin, Xianan Huang, Xianan Huang, Xiazhe Tu and Yuanfei Li</i> Power Economic Research Institute of State Grid Fujian Electric Power Co., Ltd, China
32	114	Stochastic Security Constraint Unit Commitment Considering the Correlation of Electric Vehicles Driving <i>Aiqiang Pan, Xiaolin Ge, Yunpeng Wang, Chenhao Pei and Shu Xia</i> Shanghai University of electric power, China
33	131	Cost Management Evaluation of Power Grid Engineering: A Life Cycle Theory <i>Jie Jiao, Ying Du, Jie Yang, Yanan Tian, Lin Hu and Qian Wang</i> State Grid Sichuan Economic Research Institute, China
34	133	Nonintrusive load monitoring based on particle swarm optimization <i>Qi Fu, Yi Guo, Xia Liu, Xiaolan Wang and Xiaotian Dai</i> School of Electrical Engineering and Electronic Information, XiHua University, China
35	140	Calculation and Analysis of Energy Storage Demand in Shanxi Power Grid <i>Zhang Shifeng</i> Electric Power Research Institute, State Grid Shanxi Electric Power Company, China
36	227	The Reaserch of Users-transformer Relationship Verification Method Based on Data-driven <i>Ping Li, Yonghui Yan, Mingzhu Xu, Fei Liu, Jinran Wang, Xinran Li, Ling Liu and Guoqiang Sun</i> Hohai University, CHINA
37	368	Research Status and Prospective on Current Transformer Saturation Recognition <i>Wenchao Lu, Jiandong Duan and Qian Sun</i> Xi'an University of Technology, China
38	433	Study on Evaluation of Sampling Test Efficiency for Distribution Transformer <i>Jinmeng Chen, Yi Li, Maohuan Fang, Jingqing Zhang and Hui Li</i> State Grid Material Co., LTD., China
39	440	Integration of Electric Vehicles into Power Grid based on Probabilistic Simulation <i>Yuan Xu, Tao Li, Hui Xu, Feng Gao, Tian Xia, Qinglai Guo and Jun Hu</i> THEIRI, China

Time: 13:30-15:30		Session Chairs: Yufei Teng, State Grid Sichuan Electric Power Research Institute Di Cao, University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
40	498	Grounding Current of Converter Transformer Core and Core Clamp and Its Harmonic Characteristics <i>Minghong Su, Xiao Yao, Dianbo Zhou, Yuhang He and Jing Zhang</i> State Grid Sichuan Electric Power Research Institute, China
41	578	Research on Meteorological Sensitive Load in Jiangsu based on Meteorological Dominant Factors <i>Jing Shi, Delv Zhu, Hu Li, Bingjie Li, Jian Tan and Yunli Shi</i> State Grid Jiangsu Electric Power Company Economic Research Institute, China
42	672	LBBF Algorithm for TDMA Time Slot Scheduling in VPLC System Based on HomePlug AV <i>Jian Cao, Xiaosheng Liu, Honghong Pu, Ying Cui, Huabao Xie and Dianguo Xu</i> Harbin Institute of Technology, China
43	728	Research on the Optimal Economic Dispatching of Micro-grid with Hybrid Energy Storage <i>Changqing Yu, Chunyan Li, Chenyu Zhao, Lili Wen, Xuan Fan and Wenyue Cai</i> Chongqing University, China
44	752	Research on a Typical Connection Mode of Flexible DC Distribution Applied to High Reliability Area <i>Jian Yuan, Lin Su, Anxin Yan and Ruoxuan Sun</i> China Energy Engineering Group Jiangsu Power Design Institute CO., LTD, China
45	755	Short-Term Load Forecasting of Microgrid Based on Grey Correlation Analysis and Neural Network Optimized by Mind Evolutionary Algorithm <i>Haoyan Yang, Jun Long, Penghui He and Yuqi Zheng</i> Guangxi University, China
46	761	Asymmetric Fault Propagation Mechanism on AC Side of Hybrid Microgrid And Suppression Methods <i>Yongqiang Zhu, Kang Liu, Quan Zhang, Minxiao Han, Kai Che and Yongyong Jia</i> North China Electric Power University, China
47	766	Reliability Evaluation of Offshore Oil Platform Power System <i>Wei Du, Xianjue Luo, Xue Li, Jun Guan, Chang Xiong and Deyi Li</i> Xi'an Jiao Tong University, China
48	810	Study on the Influence of Key Structure Parameters of Conical Insulator on AC and DC Electric Field Distribution <i>Jianying Zhong, Bo Zhang, Liucheng Hao, Yingqian Du and Yapei Liu</i> PingGao Group Co., Ltd, China
49	903	Research on a Kind of Ubiquitous Power Internet of Things System for Strong Smart Power Grid <i>Bin Xu, Qing Chen, Jun Ma, Yan Yu and Zhixia Zhang</i> Tianjin Tianda Qiusi Electric High Technology Co., China

Time: 13:30-15:30		Session Chairs: Yufei Teng, State Grid Sichuan Electric Power Research Institute Di Cao, University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
50	921	Research on Wind-hydro-thermal Power System Multi-time Scale Coordinated Optimal Dispatch <i>Honglian Ma, Wei Du, Qi Wang and Naiwei Gong</i> Xi'an Jiao Tong University, China
51	927	Smart Street Lighting System with Networking Communication <i>Nathawat Sukhathai and Thavatchai Tayjasanant</i> Chulalongkorn University, Thailand
52	935	Technical Analysis of the Charge/discharge Rate and the Capacity of Batteries in Meeting the Residential Peak Demand within a Community Solar <i>Muhammad Hayat, Farhad Shahnian and Gm Shafiullah</i> Murdoch University, Australia
53	941	Microgrid Reliability Evaluation Using Distributed Energy Storage Systems <i>Mohammed Abdulgalil, Muhammad Khalid and Jaber Alshehri</i> King Fahd University of Petroleum & Minerals, Saudi Arabia
54	980	Semi-fragile watermarking for color image authentication in power internet of things <i>Yaoran Huo, Jiajia Liu, Qin Zhang, Yu Zeng, Fan Yang, Jian Chang, Yuqiang Fan and Cheng Liu</i> Information & Communication Company, State Grid Sichuan Electric Power Company, China
55	993	Field Implementation of a Real-time Battery Control Scheme for a Microgrid at the University of California, Riverside <i>Yun Xue, Michael Todd, Sadrul Ula and Alfredo Martinez-Morales</i> UC Riverside, United States
56	1010	Noncontact Current Source Reconstruction Based on Independent Component Analysis-A Simulation Study <i>Ayambire Patrick Nyaaba, Qi Huang, Jian Li, Siming Pan, Bin Gao, Guiyun Tian, Shijun Zhang and Bin Xiao</i> University of Electronic Science and Technology of China, China
57	124	Household Energy Consumption Behaviors Analysis Based on Chicken Swarm Optimization and PrefixSpan Algorithm <i>Yuncong Yang, Jian Li, Chen Luan, Huang Qi, Zhao Jin, Zhiliang Wang and Dongsheng Cai</i> University of Electronic Science and Technology of China, China
58	308	Isolated Microgrid Capacity Configuration Considering Economic Risk of Customer Interruption <i>Junpeng Zhu, Yi Zheng, Yaqi Wang and Yue Yuan</i> Hohai University, China
59	595	Centralized Demand Response Framework of an Aggregator under Uncertainty <i>Bala Sai Kiran Patnam and Naran M Pindoriya</i> Indian Institute of Technology Gandhinagar, India

Time: 13:30-15:30		Session Chairs: Yufei Teng, State Grid Sichuan Electric Power Research Institute Di Cao, University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
60	486	Research on the test of communication protocol of power quality monitoring platform <i>Jinhao Wang, Da Lei and Xiaoyang Ma</i> Sichuan University, China
61	789	Abnormal Electricity Consumption Detection from Incomplete Records in Power System <i>Yang Zhang, Pietro Colella, Andrea Mazza, Ettore Bompard, Emiliano Roggero and Giuliana Galofaro</i> Politecnico Di Torino - Dipartimento Energia, Italy
62	99	Analysis on Complaint Behavior of Electric Power Customers <i>Defu Cai, Wenna Wang, Kun Chen, Kan Cao, Zeyang Tang, Haiguang Liu, Xianjun Ma, Min Xu and Zhenting He</i> State Grid Hubei Electric Power Research Institute, China
63	166	Study of Intelligent Inspection for Distribution Network Based on Internet of Things <i>Yang Zhichun, Shen Yu, Yang Fan, Wan Zilin, Lei Yang, Su Lei and Che Fangyi</i> State Grid Hubei Electric Power Co., Ltd, China
64	200	A Coordinated Voltage Control Strategy for Coordination of Wind Turbines Variable Mode control and OLTC in Distribution Grid <i>Wei Huang, Tianfei Guo, Yu Gao and Liangliang Hua</i> North China Electric Power University, China
65	673	Real-time Model Predictive Control for The Regional Autonomy Multi-microgrids With Three-Phase/Single-Phase Architecture <i>Yuhua Lv, Ping Yang, Zejian Liu, Jintao Chen and Ying Chen</i> Guangdong Key Laboratory of Clean Energy Technology, School of Electric Power, South China University of Technology, China
66	346	Comparative analysis of technology and economy on echelon battery energy storage <i>Bingjie Li, Hu Li, Guojing Liu, Jing Shi, Linyuan Wang and Hongda Zhao</i> State Grid Jiangsu Electric Power Co., Ltd., Nanjing

Coffee Break

Poster Session IV

Venue: Jinjiang Hall

Time: 16:00-18:00		Session Chairs: Shuheng Chen and Xiao Xu University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
67	77	Simulation Implementation of Embedded Protection Control Platform <i>Bixiang Dai</i> Nanjing SAC Power Grid Automation Co., Ltd., China

Time: 16:00-18:00		Session Chairs: Shuheng Chen and Xiao Xu University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
68	113	Research on Virtual Synchronous Generator Control Strategy Based on the Battery State of Charge <i>Jialin Peng, Jianhui Meng, Yi Wang and Meiqi Song</i> State Key Laboratory of Alternate Electrical Power System With Renewable Energy Sources, China
69	117	The Contrastive Analysis of Control of Microgrid Inverter <i>Yaru Xu, Xiaoning Xu, Xiaonan Yang, Feng Han, Xuhan Wu and Yiping Yu</i> Hohai University, China
70	119	Simulation Study on the Transient Characteristics of HVDC Voltage Divider and Their Effects on undervoltage sensing protection <i>Teng Yufei, Li Xiaopeng, Wu Jie and Liu Mingzhong</i> State Grid Sichuan electric Power Research Institute, China
71	154	Research on Prevention Measures of 380V Load Branch Over-step Trip in Substation <i>Zhiyuan Ma, Xianqiang Li, Hui Hou, Huanqing Zhang, Yuan Jiang, Chaojin Sima, Cong Yu and Du Liu</i> Wuhan University of Technology, China
72	196	Research on Multiple Constraints of Flexible Virtual Capacitor Control for VSC <i>Meiqi Song, Jianhui Meng, Yi Wang and Jialin Peng</i> State Key Laboratory of Alternate Electrical Power System With Renewable Energy Sources, China
73	220	Microgrid Adaptive Current Instantaneous Trip Protection <i>Bilian Liao, Jie Cheng and Guangwei Ren</i> Guangxi University, China
74	221	Research on Retrofitting Scheme of Merging Unit and Intelligent Terminal in 500kV Smart Substation <i>Xuanwen Ding, Jie Wu, Yongkang Zheng, Mingzhong Liu, Wenyue Zhou and Dongliang Nan</i> Electric Power Research Institute State Grid Sichuan Province Electric Power Company, China
75	325	OLT Analysis and Protection Control Design for ± 800 kV UHVDC System <i>Dongliang Nan, Yuting Dong, Hongshan Zhuang, Jie Wu, Yi Yang and Yonghui Sun</i> Hohai University, China
76	326	State-of-Charge Dynamic Balancing Control for Multi-Energy Storage Units in DC Distribution System <i>Chen Wang, Yun Zhang, Jianhui Meng and Yi Wang</i> State Key Laboratory of Alternate Electrical Power System With Renewable Energy Sources, China

Time: 16:00-18:00		Session Chair: Shuheng Chen and Xiao Xu University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
77	393	The Bidirectional DC/DC Converter Operation Mode Control Algorithm Based on RBF Neural Network <i>Liang Zhang, Kang Chen, Shengbin Chi, Ling Lyu, Huanhuan Ma and Kaiwen Wang</i> Northeast Electric Power University, China
78	425	Research on Protection for the Flexible Substation <i>Huanhuan Qi</i> Global Energy Interconnection Research Institute Co., Ltd, CHINA
79	464	Model Predictive control of dual-active-bridge based fast battery charger for plug-in hybrid electric vehicle in the future grid <i>Dehao Qin, Qiuye Sun, Dazhong Ma and Jiazheng Sun</i> Northeastern University, China
80	524	A Dual Inverter Based Grid Connected Solar Power Conditioning System with Coordinated Closed Loop Control <i>Baibhav Kumar Gupta, Amol Iswararao Gedam and Ramachandra Sekhar</i> Indian Institute of Technology, Ropar, India
81	553	Research on seamless switching control strategy of VSC-MTDC based on OPF <i>Yutong Liu, Yang Qi, Xiao Pan and Rukong Jin</i> Economic and Technological Research Institute of State Grid Liaoning Electric Power Co., Ltd, China
82	649	Research of MMC-UPFC Control Strategy <i>Jianpo Zhang, Ziwei Hu and Hongyan Zhang</i> North China Electric Power University, China
83	674	A New Method for HVDC Grounding Electrode Line Protection Based on Multi-Band Voltage Amplitude Integration <i>Yi Zhuang, Yufei Teng, Xiaopeng Li and Jiping Lu</i> Chongqing University, China
84	704	Research on the Model of CVT Operation Performance Based on the PHM System <i>Sujie Liu, Hao Wang, Xianshun Chen, Ruihan Wang and Cheng Chen</i> State Grid Sichuan Electric Power Corporation Metering Center, China
85	714	High-frequency Modeling of UHVDC Converter Station Based on PSCAD <i>Chaonan Ying, Zheng Xu and Chenxi Luo</i> Zhejiang University, China
86	724	Evaluation of Distance Protection Responses in AC Power System with Converter Interface <i>Hussain Alharthi, Jaber Alshehri, Muhammad Khalid, Ahmed Alzahrani and Mohammed Faggal</i> King Fahd University of Petroleum & Minerals, Saudi Arabia

Time: 16:00-18:00		Session Chair: Shuheng Chen and Xiao Xu University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
87	737	A voltage-balanced hybrid MMC topology for DC fault ride-through <i>Mao Ji, Yi Wang, Kaidong Tan and Chen Wang</i> State Key Laboratory of Alternate Electrical Power System with Renewable Energy Sources, China
88	773	Research on identification and calculation method of harmonic active power responsibility <i>Min Guo, Weidong Chen and Qingren Jin</i> Electric Power Research Institute of Guangxi Power Grid Co., Ltd., China
89	829	Model Predictive Control for Cascaded Multilevel Inverter based on Lyapunov Function <i>Rao Rao and Shiyong Hou</i> Chongqing University, China
90	837	Impacts of Switching AC Filters of UHVDC Converter Stations on Harmonics <i>Luo Shanshan, Chen Bing and Nayan Yu</i> Engineer, China
91	863	Data center visualization based on uDC-Builder <i>Zhenyu Tang, Xujing Wen, Yan Wu, Yuan Yin and Luocheng Shen</i> Information & Communication Company, State Grid Sichuan Electric Power Company, China
92	893	A Rapid Method for Voltage Sag Detection Based on Adaptive Order Morphology <i>Chunlin Guo, Kai Ma, Xiangzheng Song and Jianing Wang</i> North China Electric Power University, China
93	917	The realized forms of power electronics technology in new generation distribution power system <i>Shengzhi Lu, Weibing Sun, Xin Zhan, Feng Zhou, Yezhang Cao and Zhixia Zhang</i> Tianjin Tianda Qiushi Electric High Technology Co., China
94	918	A Virtual DC Machine Control Strategy for Dual Active Bridge DC-DC Converter <i>Yu Guo, Jianhui Meng, Yi Wang and Chen Wang</i> State Key Laboratory of Alternate Electrical Power System With Renewable Energy Sources, China
95	932	Comparison between Two LCL DC Transformer Topologies: SCR-LCL and IGBT-LCL <i>Mohammed Abdulgalil, Abubakr Elsayed, Muhammad Khalid and Ibrahim Elamin</i> KFUPM, Saudi Arabia
96	958	A Control Methodolgy of Inverter-Based Battery Energy Storage System for AC Microgrid <i>Thanakrit Kittiwarat, Surapong Suwankawin, Raksina Khanaroek and Kittanut Pongjirapat</i> Chulalongkorn University, Thailand
97	1012	PSO-based Secondary Frequency Control and Active Power Sharing <i>Mahmuda Begum, Li Li and Jianguo Zhu</i> University of Technology Sydney, Australia

Time: 16:00-18:00		Session Chair: Shuheng Chen and Xiao Xu University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
98	869	An Enhanced Droop Control Strategy for Accurate Reactive Power Sharing in Islanded Microgrids <i>Shujie Zhang, Chunmeng Chen, Ling Dong, Yongbin Li, Jianyong Zhao, Heng Nian and Liang Kong</i> Zhejiang University, China
99	991	Positive Sequence Modeling of AC Drive Systems with Power Interruption Ride-Through Capability in DigSILENT <i>Salish Maharjan, Ashwin M. Khambadkone and Rahul Bhujade</i> National University of Singapore, Singapore
100	787	Harmonic and Magnetic Leakage from Wireless Charging System for Electric Vehicles <i>Feng Wen, Qiang Li, Rui Li, Tao Wu and Li Liu</i> Nanjing University of Science and Technology, China
101	495	Evaluation of Filtering Function for Grid Connected STATCOM in Wind Power Applications <i>Li Shen, Xuotong Ouyang, Yunche Su, Mi Zhu, Yunling Wang, Ting Li and Di Ai</i> State Grid Sichuan Economic Research Institute, China
102	527	Reactive Power Compensation and Control Strategy for MMC-STATCOM Doubly-Fed Wind Farm <i>Tianqi Lu, Youyin Wang, Zhanjun Li, Meijun Li, Weimao Xu, Yunche Su, Zhijian Cao and Na Zhang</i> State Grid Liaoning Electric Power CO., LTD. Power Economic Research Institute, China
103	157	Circulating Current Control for Hybrid MMCs under DC Voltage Sag <i>Pengfei Hu, Jie Guo, Rui Yin and Yi Du</i> University of Electronic Science and Technology of China, China
104	603	Switched Capacitor Based Multilevel Boost Inverter for Smart Grid Applications <i>Girish Ganesan R, Raghuram Shankar, Mahadevan B and Narayanan K</i> Sastra Deemed University, INDIA
105	11	Condition-Based Maintenance of Protection Systems Based on Hierarchical Fuzzy Evaluation <i>Yong Chen, Shengnan Li, Li Zhang, Jianshuo Han, Xiaoqiang Qiu and Zhihui Dai</i> North China Electric Power University, China
106	17	Study of Superconducting Fault Current Limiters for MMC-MTDC with HVDC CBs <i>Jianlong Sun, Xiao Han, Yan Li, Zheren Zhang, Zheng Xu and Yuzhe Xu</i> Zhejiang University, China
107	494	Macro-level Evaluation of Distribution Network Operational Risks Caused by Distributed Generation <i>Bibin Huang, Jing Hu, Bowen Hong, Hu Yan and Kaihui Feng</i> State Grid Energy Research Institute Co., LTD, China

Time: 16:00-18:00		Session Chair: Shuheng Chen and Xiao Xu University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
108	103	Prediction of Critical Clearing Time for Transient Stability Based on Ensemble Extreme Learning Machine Regression Model Zhen Chen, Xiaoyan Han, Chengwei Fan, Hua Zhang and Chang Liu State Grid Sichuan Electric Power Research Institute, China
109	35	A Review on Dynamic Analysis Methods of Power System Frequency <i>Yuqiang Hou, Jianbing Xu, Jiajia Wang and Xuelian Wu</i> NARI Group Corporation, China
110	43	PSASP-based City Grid Ring-Closing Strategy Research and Corresponding Risk Assessment <i>Weiyang Zhou, Hua Li, Xiaoping Su and Tingting Xiang</i> State Grid Chengdu Power Supply Company, China
111	56	A New Method for Characterizing Voltage Sag Tolerance <i>Kai Ding, Wei Li, Pan Hu, Jia-Ni Xie and Ying Wang</i> Sichuan University, China
112	59	Evaluation Method of Equipment Voltage Sag Sensitivity Based on Kernel Density Estimation <i>Zhichao Lin, Busheng Luo and Zhijian Song</i> Huizhou Power Supply Bureau of Guangdong Power Grid Company Limited, China
113	112	Research on Potential Evaluation Model of Electric Energy Alternative <i>Yi Du, Kangli Xiang, Changyong Lin, Hongyang Lin, Xiazhe Tu and Huan Zheng</i> Power Economic Research Institute of State Grid Fujian Electric Power Company, China
114	143	Monthly Generation Unit Maintenance Optimization Method Considering Power Supply Capacity and Peak Regulation Capacity <i>Zikun Zhu, Jianxin Zeng, Xiaoli Zheng, Cong Zhou, Quanchao Zheng and Nan Zhang</i> Guangdong Yitaida Technology Development Co., LTD, China
115	188	Analysis of a Relay Protection Responding to 220kV Transmission Line <i>Huidong Guo, Mengqiong Wang and Zhenguo Ma</i> State Grid Shanxi Electric Power Research Institute, China
116	231	Research on Quick Distributed Feeder Automation for Fast Fault Isolation/Self-healing in Distribution Network <i>Jie Zhou, Lu Wang, Mingxiang Liu, Pan Dai, Rongguo Hao and Yingyuan Zhang</i> NARI Group Corporation (State Grid Electric Power Research Institute), China
117	248	Mathematical Modeling of Impedance During Power Swing as a Function of Time <i>Aldrich Zeno and Jordan Orillaza</i> University of the Philippines Diliman, Philippines
118	255	Voltage Sensitivity Analysis and Demand Dispatch Option of Electric Vehicle in Smart Grid <i>Muhammad Aqib and Abhisek Ukil</i> University of Auckland, New Zealand

Time: 16:00-18:00		Session Chair: Shuheng Chen and Xiao Xu University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
119	267	Analysis of Coordinated Control Strategy for Large-scale Renewable Energy VSC-HVDC Integration <i>Yan Li</i> China Electric Power Research Institute (CEPRI), China
120	277	Open-circuit Fault Diagnosis for Modular Multilevel Converter Using Wavelet Neural Network <i>Pu Lin, Zhaoyun Zhang, Zhi Zhang, Li Kang and Xinghua Wang</i> Dongguan University of Technology, China
121	280	Research Concept of Pattern Features of Generalized Load Curves in Future Power Systems <i>Jinghua Li, Changwei Lai, Bo Chen, Shanyang Wei, Qian Huang and Junjie Liang</i> Guangxi University, China
122	286	Research on Dynamic Voltage Characteristics of AC/DC Hybrid System Based on PET <i>Zheng Zeming</i> Tsinghua University, China
123	312	Emergency Control Strategy of Ultra-low Frequency Oscillations Based on WAMS <i>Qin Liu, Gang Chen, Baisi Liu, Yudong Zhang, Zhuolin Zeng, Chengwei Fan and Xiaoyan Han</i> State Grid Sichuan Electric Power Company, China
124	339	An evolution algorithm of the distribution network reconfiguration to avoid the infeasible solution <i>Yufei Rao, Weijun Teng, Zhaohui Li, Haijing Yang, Ze Gao, Jianbo Wang, Chunsun Tian and Yang Liu</i> Henan Electric Power Research Institute, China
125	352	Fault Analysis and Countermeasure of Arc Suppression Coil in 66kV System <i>Qinghao Wang</i> Fushun Power Supply Company, China
126	358	Selection Method of Neutral Point Overvoltage Protection for 220kV Transformer <i>Tao Wang</i> Fushun Power Supply Company, China
127	496	MMC-HVDC Fault Ride-through Coordination Control Strategy at Both Ends <i>Guangqiang Peng, Yueyang Wang, Shiyu Chen and Yuhong Wang</i> Sichuan University, China
128	531	Stochastic Geometry-based Model for Spatio-temporal Expanding Smart Grids <i>Rachad Atat, Muhammad Ismail and Erchin Serpedin</i> Texas A&M University at Qatar, Qatar
129	537	A Small-signal Sub-synchronous Oscillation Analysis Caused by SVC in Weak-link Power Grid <i>Xinwei Sun, Hua Zhang, Huabo Shi, Xi Wang and Lun Tang</i> State Grid Sichuan Electric Power Research Institute, China

Time: 16:00-18:00		Session Chair: Shuheng Chen and Xiao Xu University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
130	552	Research on On-line Monitoring Fault Diagnosis System of GIS UHF Partial Discharge <i>Yifan Wang, Jinlong Gong, Zhenyuan Zeng and Zhaoqiang Wang</i> State Grid Zhejiang Electric Power Research Institute, Hangzhou
131	606	A Decompositon Method for Weekly Unit Commitment Considering Hydro Power Characteristics <i>Chenjia Feng, Chengcheng Shao, Shen Zhang, Yanan Wang and Ding Li</i> Xi'an Jiaotong University, China
132	675	Sensitivity Vectors and Contingency Ranking using Linearised AC Load Flow <i>Priyanka Murali, Gopal Gajjar and S. A. Soman</i> Indian Institute of Technology-B, India
133	710	The quantitative assessment of the energy consumption about distribution transformer for charging stations <i>Li Yuqian, Jiang Jiandong, Han Wenwen, Mai Kaibo and Feng Chen</i> Zhengzhou University, China
134	747	Evaluation Method for HVDC Commutation Failure Caused by Inrush Current <i>Yufei Rao, Wei Cui, Chenghao Li, Yang Liu, Jianbo Wang and Hua Wang</i> Electrical Power Research Institute of Henan Electric Power Corporation, China
135	769	Quantifying the Performance of Pumped Hydro Storage in Supporting Renewable Integrated Power System <i>Min Wei, Yan Luo, Wei Xu, Jie Sheng, Xiaorong Xie and Zhixue Li</i> Beijing Zhuozhi Energy Research Technology Co., Ltd., China
136	783	THE RESEARCH ON HIGH VOLTAGE ELECTRONIC SWITCH <i>Rui Zhang and Hua Zhang</i> State Grid Sichuan Electric Power Research Institute, China
137	834	Review and Applications of Virtual Synchronous Machines Technologies <i>Yingjun Liu, Mukai Hao, Yunpeng He, Chuanzhi Zang and Peng Zeng</i> Shenyang Institute of Automation, Chinese Academy of Sciences, China
138	838	Engineering Application and Operation Analysis of Virtual Synchronous Generators <i>Xuekun Cheng</i> State Grid Jibei Electric Power Co., Ltd. Research Institute, China
139	845	Power System Virtual Inertia Implemented by Thermostatically Controlled Loads <i>Zhe Wang, Yuqing Bao, Cheng Shen and Chen Chen</i> Nanjing Normal University, China
140	853	Modeling and Analysis of Super-synchronous Oscillation in Converters-dominated Power System Based on Multivariable Frequency Domain Method <i>Yabing Yan, Weihua Zhou, Weijun Zhu, Siyuan Guo, Hao Xu and Ding Wang</i> State Grid Hunan Electric Power Company Limited Research Institute, China

Time: 16:00-18:00		Session Chair: Shuheng Chen and Xiao Xu University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
141	857	Construction of Dispatching, Maintenance and Reconditions Under Provincial-Municipal Integration System <i>Liu Jiayu, Yang Junhuan, Shen Luo Chen and Tian Yuan</i> State Grid Sichuan Information & Communication Company, China
142	878	Research and Application of Waste Heat Recovery and Cascade Utilization for Low-grade Flue Gas in Industrial Field <i>Naili Guo, Zhen Yu, Liang Zhao, Mao Li, Jiebin Yang, Jun Tang, Qiang Li and Dong Li</i> National Institute of Measurement and Testing Technology, China
143	971	Synchrophasor Measurements for Power System Monitoring and Control under the Standard IEC/IEEE 60255-118-1 <i>Shi Bonian, Ken Martin and Allen Goldstein</i> Beijing Sifang Automation Company, China
144	978	Effect of Forecast Accuracy on Day Ahead Prediction of Five Coincident Peak Days <i>Jinxiang Liu and Laura Brown</i> Michigan Technological University, USA
145	986	A Robust Control Strategy for Air Conditioner Group to Participate in Power System Frequency Regulation <i>Cheng Shen, Yu-Qing Bao, Tong-Zhou Ji, Jin-Long Zhang and Zhe Wang</i> Nanjing Normal University, China
146	209	Emergency Capacity Prediction of Direct Buried Cable under Rainfall Condition <i>Tinghan Song</i> Electric Power College, South China University of Technology, China
147	516	Framework for Computationally Efficient Outage Detection <i>Nihith Koundinya Spvs, Vignesh S, Sowmya R, Girish Ganesan R and Narayanan K</i> SASTRA Deemed to be University, India
148	602	Method of Static Reactive Power Allocation Considering N-1 Failure Mode and Load Fluctuation <i>Bo Yuan</i> Economic and Technological Research Institute of State Grid Hebei Electric Power Co., Ltd. , China
149	920	The Characteristics Analysis of Controllable Reactor of Transformer Type <i>Guosheng Zhao and Pei Li</i> Zhengzhou University, China

Time: 16:00-18:00		Session Chair: Shuheng Chen and Xiao Xu University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
150	558	The Runner Structure Fluid Solid Coupling Research Of Bulb Tubular Turbine Based On The Cam Relationship <i>Shengyang Peng, Zhenggui Li, Bo Wang, Xiaobing Liu, Yongzhi Zhao, Xiaoyan Han, Lijie Ding, Qing Yang and Hongguang Shi</i> Xihua University, China
151	226	Bandpass filtering scheme for improving phasor measurement accuracy <i>Xingchen Han, Hengxu Zhang, Fang Shi, Peng Wang and Yunbo Wang</i> Shandong University, China
152	247	Optimal Expansion Planning of AC/DC Hybrid System Integrated with VSC Control Strategy <i>Weiting Xu, Ao Li, Yunche Su, Mi Zhu, Xuetong Ouyang and Xinting Yang</i> State Grid Sichuan Economic Research Institute, China
153	252	Tech-economic Benefit Evaluation and Decision for Distribution Network Planning Based on Fuzzy Analysis Hierarchical Process <i>Tianyou Li, Zhixuan Liu, Yue Xiang, Junyong Liu, Zhuozhen Jiang and Yang Wang</i> Sichuan University, China
154	270	An optimal capacity planning method for multiple types of renewable energy in combined operation considering different peak-shaving demands <i>Xi Ye, Xuetong Ouyang, Xi Zhang, Mi Zhu and Weiting Xu</i> State Grid Sichuan Economic Research Institute, China
155	299	Explicit Formula Based Reliability Estimation Method for Distribution Feeder <i>Yunche Su, Siqi Cheng, Jun Rong, Weiting Xu, Shen Li, Yunkai Lei, Tianqi Lu and Chiyao Chen</i> State Grid Sichuan Economic Research Institute, China
156	373	Reliability Assessment of High-Medium-Low Voltage Integrated Distribution Network Using Hybrid Method <i>Lixiong Xu, Junyong Liu and Lanling Wang</i> Sichuan University, China
157	199	Method for Peration Control Obstacle location and Fault Prediction of Substation Based on Information Driven <i>Jie Wu, Yufei Teng, Wenxuan Ding, Dongliang Nan, Kaike Wang and Hongshan Zhuang</i> State Grid Sichuan Province Electric Power Company, China
158	386	Fusion of Multi-time Section Measurements for State Estimation of Power System <i>Xiaoli Liu, Lei Yao, Xianghui Zeng, Shuaidong Zhang, Muqing Liang, Changhong Deng and Yujie Ding</i> Wuhan University, China
159	186	Non-Intrusive Load Monitoring using Feed Forward Neural Network <i>Dhivya Sampath Kumar, K.L Low, Anurag Sharma and Wai Lok Woo</i> National University of Singapore, Singapore

Time: 16:00-18:00		Session Chair: Shuheng Chen and Xiao Xu University of Electronic Science and Technology of China
Board Number	Paper ID	Title & Authors
160	19	Numerical calculation of electric field safety area of 10 kV transformer based on Maxwell <i>Hao Chen, Ya Gao and Xiaosong Zhu</i> Chongqing University, China
161	599	Situational awareness for dynamic power system based on UKF-driven residual matrix analysis <i>Ruiqiang Zhang, Jianguang Yin, Fei Peng, Guodong Qi and Quanquan Gong</i> State Grid Shandong Province Electric Power Research Institute, China
162	870	Active distribution network planning method under power-user interaction mode <i>Xibin Yang, Shilong Wang, Shuangshang Song, Zhijun Ren, Minhua Guo, Hongxia Guo and Ping Yang</i> South China University of Technology, China
163	762	Day-Ahead Reactive Power Optimization Model for Active Distribution Network based on Various Active Management Measurements <i>Xin Ma, Jinsong Liu, Ruipeng Guo, Dewei Xu, Yadi Zhang, Yanping Wang and Zhao Huang</i> Zhejiang University, China
164	389	Short-term Daily Load Forecasting in Distribution Power System Based on VMD & BA-LSSVM Combined Method <i>Yuanhong Liu, Tao Wei, Fengzhan Zhao, Shuai Hao, Yu Zhang, Wei Zhang, Mingze Zhang, Yinong Li and Xincong Li</i> China Agricultural University, China
165	392	Reliability Evaluation of Distribution Power Unit Based on DG Power Contribution <i>Mingze Zhang, Yuanhong Liu, Tao Wei, Fengzhan Zhao, Shuai Hao, Yu Zhang, Wei Zhang, Yinong Li and Xincong Li</i> China Agricultural University, China
166	543	Architecture Design and Evaluation of Hybrid AC/DC Power Grids Based on Power Electronic Transformer <i>Yanhong Yang, Wei Pei, Shizhong Zhang and Hua Ye</i> Institute of Electrical Engineering, Chinese Academy of Sciences, China

AGENDA

FRIDAY, MAY 24

TIME	ACTIVITY	VENUE
08:30-17:30	Registration & Conference Kits Collection	Outside Jinjiang Hall (锦江厅外)
08:30-10:00	Technical Sessions (TS21-27) & Special Sessions (SS09-12)	See Next Page
10:00-10:30	Coffee Break	
10:30-12:00	Technical Sessions (TS28-34) & Special Sessions (SS13-15)	See Next Page
12:00-13:30	Lunch	
13:30-15:30	Technical Sessions (TS35-40) & Special Sessions (SS16-18)	See Next Page
15:30-16:00	Coffee Break	
16:00-18:00	Technical Sessions (TS41-45) & Special Sessions (SS19-21)	See Next Page

Technical Sessions

08:30-10:00 | FRIDAY, MAY 24

Session #	Session Title	Venue
TS21	Electricity Market, Innovative Business Mechanism, Policy/Regulatory Aspects-I	Chamber of Peony (牡丹亭)
TS22	Emerging Technologies and End-user Systems-V	Chamber of Blossom (梅兰阁)
TS23	Grid Operation and Management -X	Chamber of Lotus (芙蓉居)
TS24	Grid Operation and Management -XI	Brocade City Hall-1,2 (锦城 1、2 厅)
TS25	Power Electronics and Control and Protection systems for Smart Grids-III	Four Seasons Hall-3,4 (四季 3、4 厅)
TS26	Power Electronics and Control and Protection systems for Smart Grids-IV	Elegance and Auspice Room (雅瑞厅)
TS27	Renewable Generation and Distributed Energy Resources Integration -V	Brocade City Hall-3 (锦城 3 厅)

10:30-12:00 | FRIDAY, MAY 24

TS28	Computational Intelligence Applications, Information and Communication Technologies (ICT), and Cyber-Security-II	Chamber of Mist (馨雨阁)
TS29	Electricity Market, Innovative Business Mechanism, Policy/Regulatory Aspects-II	Chamber of Peony (牡丹亭)"
TS30	Grid Operation and Management -XII	Chamber of Lotus (芙蓉居)
TS31	Grid Operation and Management -XIII	Brocade City Hall-1,2 (锦城 1、2 厅)
TS32	Power Electronics and Control and Protection systems for Smart Grids-V	Four Seasons Hall-3,4 (四季 3、4 厅)
TS33	Computational Intelligence Applications, Information and Communication Technologies (ICT), and Cyber-Security-III	Elegance and Auspice Room (雅瑞厅)
TS34	Renewable Generation and Distributed Energy Resources Integration-VI	Brocade City Hall-3 (锦城 3 厅)

13:30-15:30 | FRIDAY, MAY 24

TS35	Grid Operation and Management -XIV	Chamber of Mist (馨雨阁)
TS36	Power Electronics and Control and Protection systems for Smart Grids-VI	Chamber of Dew (浣花轩)
TS37	Renewable Generation and Distributed Energy Resources Integration-VII	Chamber of Dialogue (相语堂)
TS38	Electricity Market, Innovative Business Mechanism, Policy/Regulatory Aspects-III	Chamber of Peony (牡丹亭)
TS39	Emerging Technologies and End-user Systems-VI	Chamber of Blossom (梅兰阁)
TS40	Renewable Generation and Distributed Energy Resources Integration-VIII	Chamber of Lotus (芙蓉居)

FRIDAY, MAY 24

16:00-18:00 | FRIDAY, MAY 24

Session #	Session Title	Venue
TS41	Grid Operation and Management -XV	Chamber of Mist (馨雨阁)
TS42	Power Electronics and Control and Protection systems for Smart Grids-VII	Chamber of Dew (浣花轩)
TS43	Renewable Generation and Distributed Energy Resources Integration-IX	Chamber of Dialogue (相语堂)
TS44	Grid Operation and Management -XVI	Chamber of Peony (牡丹亭)
TS45	Renewable Generation and Distributed Energy Resources Integration-X	Chamber of Lotus (芙蓉居)

Special Sessions

08:30-10:00 | FRIDAY, MAY 24

Session #	Session Title	Venue
SS09	Smart DC Distribution Systems	Chamber of Mist (馨雨阁)
SS10	Ancillary Services Provided by Wind Power	Chamber of Dew (浣花轩)
SS11	Risk Assessment and Planning of Power Systems Integrated with High Penetration of Renewable Energies	Chamber of Dialogue (相语堂)
SS12	Big Data Analytics, Modern Artificial Intelligence and Advanced Optimization Technologies in Power and Integrated Energy Systems-I	Four Seasons Hall-1,2 (四季 1、2 厅)

10:30-12:00 | FRIDAY, MAY 24

SS13	Emerging Technologies in Regional Energy Internet	Chamber of Dew (浣花轩)
SS14	Research on Key Technologies of Optimization Management and Energy Transaction of the Distributed Resource Under the Electricity-Sold Side Liberalization	Chamber of Dialogue (相语堂)
SS15	Big Data Analytics, Modern Artificial Intelligence and Advanced Optimization Technologies in Power and Integrated Energy Systems-II	Four Seasons Hall-1,2 (四季 1、2 厅)

13:30-15:30 | FRIDAY, MAY 24

SS16	Planning and Operation of Smart Distribution Network with High Penetration of Distributed Energy Resources and Electric Vehicles-I	Brocade City Hall-1,2 (锦城 1、2 厅)
SS17	Artificial Intelligence for Smart Grid and Sustainable Energy Systems-I	Elegance and Auspice Room (雅瑞厅)
SS18	Stochastic and Robust Optimization for Power System with High-Level Uncertain Renewable Energy Resources	Brocade City Hall-3 (锦城 3 厅)

16:00-18:00 | FRIDAY, MAY 24

SS19	Planning, Operation and Control of Large-Scale Electrical Vehicle for its Integration with Power Systems and Transportation Systems	Chamber of Blossom (梅兰阁)
SS20	Planning and Operation of Smart Distribution Network with High Penetration of Distributed Energy Resources and Electric Vehicles-II	Brocade City Hall-1,2 (锦城 1、2 厅)
SS21	Artificial Intelligence for Smart Grid and Sustainable Energy Systems-II	Elegance and Auspice Room (雅瑞厅)

Technical Sessions

08:30-10:00 | FRIDAY, MAY 24

TS21- Electricity Market, Innovative Business Mechanism, Policy/Regulatory Aspects-I

Session Chair: Fujin Deng, Southeast University

Venue: Chamber of Peony (牡丹亭)

Time	Paper ID	Title & Authors
08:30~08:45	57	Operational Reliability Analysis of Grid-Connected Microgrid Considering Operating Strategy in Market Environment <i>Biyun Chen and Hengwang Zhou</i> Guangxi University, China
08:45~09:00	100	Development of Incentive Model for Photovoltaic Generators to Participate in a Day-ahead Electricity Market in South Korea <i>Junhyuk Kong and Jaesung Jung</i> Energy Systems Research, Ajou University, South Korea
09:00~09:15	104	Optimal Power Transfer Limit Planning for Energy-intensive Industry Microgrid Considering Economic Accommodation of Wind Power <i>Yuzhou Zhou, Qiaozhu Zhai and Pai Li</i> Xi'an Jiaotong University, China
09:15~09:30	144	Long and Medium-Term Power Market Trading Security Checking Method Based on Multi-Scenario New Energy Prediction <i>Gang Qiu, Guoqing Li, Guilian Xiao, Yanjun Xue, Deliang Zhang and Wukui Zhai</i> Beijing QU Creative Technology Co., Ltd., China
09:30~09:45	149	Research on Relationship between Energy-Economy-Environment and Index System under the New Situation <i>Yi Du, Kangli Xiang, Yuanfei Li, Changyong Lin, Xiangnan Huang and Hongyang Lin</i> State Grid Fujian Electric Power Company, China

TS22- Emerging Technologies and End-user Systems-V

Session Chair: Yan Xu, Nanyang Technological University

Venue: Chamber of Blossom (梅兰阁)

Time	Paper ID	Title & Authors
08:30~08:45	760	Integrated Power Hardware-in-the-Loop and Lab Testing for Microgrid Controller <i>Hiroshi Kikusato, Taha Selim Ustun, Masaichi Suzuki, Shuichi Sugahara, Jun Hashimoto, Kenji Otani, Kenji Shirakawa, Rina Yabuki, Ken Watanabe and Tatsuaki Shimizu</i> National Institute of Advanced Industrial Science and Technology, Japan
08:45~09:00	794	Hybrid Energy Storage System for Voltage Stability in a DC Microgrid Using a Modified Control Strategy <i>Khalid Abdullah Khan and Muhammad Khalid</i> KFUPM, Saudi Arabia

FRIDAY, MAY 24

09:00~09:15	795	Cooperative Control in An Islanded Microgrid Under Blockchain-Based Market Operation <i>Huan Aaron Li and Nirmal Nair</i> University of Auckland, New Zealand
09:15~09:30	803	Research on AP Clustering of Weighted Load Index for Demand Response Potential Analysis <i>Chenyu Zhao, Chunyan Li, Ping Zhou and Yi Zeng</i> Chongqing University, China
09:30~09:45	807	Comparison of dispatch strategy in hybrid energy micro-grid with high PV penetration <i>Aobo Zhou</i> The University of Queensland, Australia
09:45~10:00	808	Inference of Tampered Smart Meters with Validations from Feeder-Level Power Injections <i>Yachen Tang, Chee-Wooi Ten and Kevin Schneider</i> GEIRINA, United States

TS23- Grid Operation and Management -X
Session Chair: Zhi Cai, China Electric Power Research Institute
Venue: Chamber of Lotus (芙蓉居)

Time	Paper ID	Title & Authors
08:30~08:45	415	Research on the Adaptability of Hubei Power Grid after the Reinforcing Project of Hubei-Chongqing Back-to-back VSC-HVDC <i>Haiguang Liu, Wenna Wang, Defu Cai, Kunpeng Zhou, Kan Cao and Hongyu Bian</i> State Grid Hubei Electric Power Research Institute, China
08:45~09:00	417	A Method for Evaluation of Transmission Section Steady-state Security Region Considering Multiple Faults and Maintenance Mode of Power Grid <i>Haiguang Liu, Kunpeng Zhou, Kan Cao, Chu Zhou, Defu Cai and Dan Xu</i> State Grid Hubei Electric Power Research Institute, China
09:00~09:15	418	Hierarchical Optimization of Cross-provincial Tie-Line Schedule Considering New Energy Consumption <i>Zhi Cai, Dan Xu, Bo Li, Weiwei Yang and Yang Liu</i> China Electric Power Research Institute, China
09:15~09:30	435	Faulty Feeder Identification Method in Resonant Grounding Distribution Network <i>Yu Xiuyong and Xiao Liye</i> Institute of Electrical Engineering, Chinese Academy of Sciences, China
09:30~09:45	439	Short-term Voltage Stability Mechanism Analysis Based on a Double-generator-one-load Model <i>Huaichang Ge, Chi Xu, Qinglai Guo, Jinyang Dong, Hongbin Sun and Bin Wang</i> Tsinghua University, China
09:45~10:00	445	Power Distribution Network Disconnection Fault Diagnosis Using Data Mining Method <i>Qiqi Zhang, Siyi Liu and Yan Zhang</i> Shanghai Jiao Tong University, China

FRIDAY, MAY 24

TS24- Grid Operation and Management -XI

Session Chair: Yizheng Xu, China Electric Power Research Institute, State Grid Corporation of China (SGCC)

Venue: Brocade City Hall-1,2 (锦城 1、2 厅)

Time	Paper ID	Title & Authors
08:30~08:45	452	Research on the load model and characteristics of inverter-fed motors for transient stability analysis <i>Baorong Zhou, Fang Zhao, Siyu Lu, Haoqin Zhan and Zhaobin Du</i> South China University of Technology, China
08:45~09:00	459	On Application Specific Requirements of PMUs for Electricity Distribution Grids <i>Yushan Hou and Vassilios Agelidis</i> Center for Electric Power and Energy, Department of Electrical Engineering, Technical University of Denmark, denmark
09:00~09:15	473	Coordinated Planning of Storage Unit in Remote Wind Farm and Grid Connection Line: A Distributionally Robust Optimization Approach <i>Libin Yang, Rui Xie, Wei Wei, Cai Sun and Shengwei Mei</i> Tsinghua University, China
09:15~09:30	479	Network Connectivity Identification Method based on Incidence Matrix and Branch Pointer Vector <i>Lun Tang, Wei Tang, Xiaoqing Chang, Shumin Miao, Liang Wang and Xia Yuan</i> State Grid Sichuan Electric Power Research Institute, China
09:30~09:45	505	Instantaneous-Power-Theory-Based Approach for Electromagnetic Transient Modeling of Loads at Bulk Supply Points <i>Yizheng Xu, Hongying Peng, Xiaomin Qiao, Qing Mu, Dechao Xu and Xing Zhang</i> China Electric Power Research Institute, China
09:45~10:00	507	Modeling and Analysis of VSC-MTDC Transmission Systems <i>Miaohong Su, Haiying Dong, Xiaojing Chen and Kaiqi Liu</i> Lanzhou Jiaotong University, China

TS25- Power Electronics and Control and Protection systems for Smart Grids-III

Session Chair: Jianbo Yi, University of Electronic Science and Technology of China

Venue: Four Seasons Hall-3,4 (四季 3、4 厅)

Time	Paper ID	Title & Authors
08:30~08:45	383	Fault Section identification method for Multi-terminal Hybrid HVDC Lines <i>Kun Zhang, Haifeng Li, Xinchu Zhu, Dachao Huang, Yuansheng Liang and Gang Wang</i> South China University of Technology, China
08:45~09:00	422	Impact of Different Protection Outlet Schemes on the Body Equipment of Large Capacity Power Flow Control Device <i>Huanhuan Qi and Yanjun Ma</i> Global Energy Interconnection Research Institute Co., Ltd, China
09:00~09:15	447	Short Circuit Analysis and Coordination of Overcurrent Relays for a Realistic Substation Located in Upper Egypt <i>Salah Kamel, Ahmed Shaban, Ahmed Korashy, Loai Nasrat, Juan Yu and Shuo Cheng Wang</i> Chongqing University, China

09:15~09:30	469	Dual Grid Voltage Modulated Direct Power Control of Grid-Connected Voltage Source Converter under Unbalanced Network Condition <i>Shuning Gao, Haoran Zhao and Yonghao Gui</i> Shandon University, China
09:30~09:45	470	Performance Analysis of the ELIS system for UHVDC Grounding Electrode Line under Line Break Faults <i>Xiaopeng Li, Yufei Teng, Xinyao Song, Shilong Li and Jing Zhao</i> State Grid Sichuan Electric Power Research Institute Chengdu, China
09:45~10:00	533	Passive Sliding Mode Variable Structure Control For MMC-UPFC <i>Shunchao Ke, Miao Zhu, Yang Chen, Changbao Zheng and Cungang Hu</i> Shanghaijiaotong University, China

TS26- Power Electronics and Control and Protection systems for Smart Grids-IV
Session Chair: Dongsheng Cai, University of Electronic Science and Technology of China
Venue: Elegance and Auspice Room (雅瑞厅)

Time	Paper ID	Title & Authors
08:30~08:45	540	Analysis and Design of Half-Bridge LCC Resonant Converter with Buck-Boost Integration Adopting Dual Carrier Modulation <i>Yiming Chen, Shiyang Yao, Jijun Gou, Jintang Luo and Leiming Lin</i> State Grid Sichuan Economic Research Institute, China
08:45~09:00	547	Research on the fault mechanism of FOCT and its reliability improvement measures <i>Fubin Pang, Yu Liu, Liangliang Song and Qiangsheng Bu</i> State Grid Jiangsu Electric Power CO., LTD. Research Institute, China
09:00~09:15	556	Dual-Channel Subsynchronous Damping Control based on Voltage Source Converter Excitation System <i>Jiancheng Zhang, Kuayu Wu, Hongtao Xiong and Boliang Lou</i> State Grid Zhejiang Electric Power Research Institute, China
09:15~09:30	650	MMC New Type Sub Module Toplogy and Control <i>Jianpo Zhang, Ziwei Hu and Xincheng Tian</i> State Key Laboratory of Alternate Electrical Power System With Renewable Energy Sources (North China Electric Power University, China
09:30~09:45	684	Improving CFI of LCC-HVDC Systems Through Voltage Compensation Using UPFC <i>Qian Chen, Yunkai Lei, Yunling Wang, Yunche Su, Ao Li, Fang Liu and Yang Liu</i> South China University of Technology, China
09:45~10:00	696	Supplementary Damping Control of STATCOM to Mitigate SSCI <i>Xu Zhang, Xiaorong Xie, Xuan Li, Jan Shair and Chun Liu</i> Tsinghua University, China

FRIDAY, MAY 24

TS27- Renewable Generation and Distributed Energy Resources Integration-V

Session Chair: Su Su, Beijing Jiaotong University

Venue: Brocade City Hall-3 (锦城 3 厅)

Time	Paper ID	Title & Authors
08:30~08:45	526	The Role of Pumped Hydro Storage in Supporting Modern Power Systems: A Review of the Practices in China <i>Yong Sun, Min Wei, Lei Wang, Wei Xu, Jie Sheng, Xiaorong Xie and Hao Nan</i> Beijing Zhuozhi Energy Research Technology Co., Ltd., China
08:45~09:00	532	Voltage Unbalance Mechanism Research with Large-scale Wind Power Integration <i>Can Chen, Hui Liu, Linlin Wu and Yuntao Ju</i> State Grid Jibei Electric Co., Ltd. Research Institute, China
09:00~09:15	557	Impact of Voltage Close Loop Control on Small Signal Stability of Virtual Synchronous Generators <i>Dawei Sun, Hui Liu, Peng Song, Xiaosheng Wang, Yu Gong, Xuekun Cheng and Junjie Wang</i> State Grid Jibei Electric Power Research Institute, China
09:15~09:30	565	Research on Reactive Power and Voltage Coordination Control Strategy for Multi-wind Farm Connecting to Power Grid <i>Bowen Liu, Xinyan Zhang, Deqian Kong, Xiaoyan Liu and Xiqiang Chang</i> State Grid Urumqi Power Supply Company, China
09:30~09:45	604	Collaborative Control of Integrated Generation and Storage for Offshore Wind Turbines <i>Xiao-Peng Ji, Zhao Liu, Weiwei Liu and Xinyu Zhang</i> Nanjing University of Science and Technology, China
09:45~10:00	631	Robust Reconfiguration of Distribution Network Considering the Access of Photovoltaic Electric Vehicle Charging Tower <i>Peifeng Shen, Qiang Liu, Guofeng Liu, Xuyan Wang, Haoliang Zhang and Jun Jiang</i> Hohai University, China

Technical Sessions

10:30-12:00 | FRIDAY MAY 24

TS28- Computational Intelligence Applications, Information and Communication Technologies (ICT), and Cyber-Security-II

Session Chair: Chun Wei, Zhejiang University of Technology

Venue: Chamber of Mist (馨雨阁)

Time	Paper ID	Title & Authors
10:30~10:45	644	On Optimization of Command-Delaying for Advanced Command Authentication in Smart Grid Systems <i>Daisuke Mashima, Ramkumar Rajendran, Toby Zhou, Binbin Chen and Biplab Sikdar</i> Illinois at Singapore Pte Ltd, Singapore

10:45~11:00	679	Fault Processing Algorithm of Power backbone Communication networks Based on Artificial Intelligence and State Perception <i>Weiwei Miao, Lei Wei, Haiyang Wu and Jian Shi</i> State Grid Jiangsu Electric Power Co., Ltd., China
11:00~11:15	934	Visual Power Line Inspection Via Multi-direction Transform <i>Tianliang Peng, Zhiyu Chen, Shaoyan Gong, Xiaolin Liu, Longchuan Yan, Jing Zhu and Dong Wang</i> State Grid Information & Telecommunication Branch, China
11:15~11:30	780	Application of Time Domain Dielectric Spectral Characteristics in Quantitative Evaluation of Oil-paper Transformer Insulation Status <i>Yang Zou, Jin He, Jinding Cai and Mengqi Wang</i> Fuzhou University, China
11:30~11:45	796	Substation One-Line Diagram Automatic Generation and Visualization <i>Jing Hong, Yue Li, Yiran Xu, Chen Yuan, Hong Fan, Guangyi Liu and Renchang Dai</i> GEIRI North America, United States
11:45~12:00	989	Poisoning Attack on Load Forecasting <i>Yi Liang, Di He and Deming Chen</i> University of Illinois at Urbana-Champaign, United States

TS29-Electricity Market, Innovative Business Mechanism, Policy/Regulatory Aspects-II

Session Chair: Yuefang Du, University of Electronic Science and Technology of China

Venue: Chamber of Peony (牡丹亭)

Time	Paper ID	Title & Authors
10:30~10:45	236	Bi-level Demand Response Scheme in the Presence of Aggregators with Thermally Responsive Loads <i>Youbo Liu, Xiaodi Wang, Junyong Liu and Hongjun Gao</i> Sichuan University, China
10:45~11:00	340	Two-stage Economic Dispatch Optimization for Integrated Energy System Using Improved Brain Storm Optimization Algorithm <i>Tiannan Ma, Lilin Peng, Ying Du and Zhuangzhuang Yu</i> State Grid Sichuan Economic Research Institute, China
11:00~11:15	349	Hydro-dominated Power Markets in Southwest China: Characteristics and Challenges <i>Shumin Miao, Bin Luo, Liang Wang, Gang Chen, Hua Zhang, Jichun Liu and Jianhua Li</i> Sichuan University, China
11:15~11:30	387	Look-Ahead Strategic Offering for a Virtual Power Plant: A Multi-Stage Stochastic Programming Approach <i>Yuzhou Zhao, Rongpeng Liu, Shunbo Lei and Yunhe Hou</i> The University of Hong Kong, Hong Kong
11:30~11:45	416	Research on the Economic Benefit of Energy Storage System Works with Photovoltaic System Considering the Cost of Electricity <i>Chunlin Guo, Qinbo Yu, Xiangzheng Song and Jingjing Yang</i> North China Electric Power University, China

11:45~12:00	444	A Pricing Mechanism for BESS in Frequency Regulation Considering Penetration of the Renewables <i>Jihui Zhang, Shengqi Zhang and Yateendra Mishra</i> Southeast University, China
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TS30- Grid Operation and Management -XII

Session Chair: Dongsheng Cai, University of Electronic Science and Technology of China

Venue: Chamber of Lotus (芙蓉居)

Time	Paper ID	Title & Authors
10:30~10:45	511	Exploiting Unused Capacity in the Grid <i>Jens Priebe, Hüseyin K. and Hao Chang</i> RWTH Aachen University, Germany
10:45~11:00	538	Comprehensive Stability Analyses for Hybrid AC/DC Microgrids with Multi-Paralleled Interlinking Converters under Distributed Control <i>Pengfeng Lin, Jinyang Fang, Chi Jin, Jianfang Xiao, Leong Hai Koh, Peng Wang, Choo Fook Hoong and Jinyu Wang</i> Newcastle University, Singapore
11:00~11:15	576	A Fuzzy Multi-objective Operation Strategy of Energy Storage System based on Gravity Search Algorithm <i>Rui Li, Menghua Fan, Haixu Song, Su Su and Wei Wang</i> SGCC State Grid Energy Research Institute Co., Ltd, China
11:15~11:30	680	Imprecise Risk Assessment of Distribution Network Based on Evidence and Utility Theory <i>Zhuohui Guo, Jianbo Yi, Yufei Teng, Yanyang Fu and Qi Huang</i> University of Electronic Science and Technology of China, China
11:30~11:45	712	Impact of Utility-Scale Energy Storage Systems on Power System Transient Stability Considering Operating Uncertainties <i>Xuekuan Xie, Yuchen Zhang, Ke Meng, Zhao Yang Dong, Junwei Liu and Shuoya Tang</i> UNSW Sydney, Australia
11:45~12:00	718	Study on Lightning Intruding Overvoltage on DC Side of ± 1100 kV Converter Station <i>Jingqiu Yu, Zheng Xu, Bo Yue and Xuan Li</i> Zhejiang University, China

TS31-Grid Operation and Management -XIII

Session Chair: Jianbo Yi, University of Electronic Science and Technology of China

Venue: Brocade City Hall-1,2 (锦城 1、2 厅)

Time	Paper ID	Title & Authors
10:30~10:45	725	Security Constrained Unit Commitment Model for AC/DC Interconnected System <i>Lili Li, Jiafei Huan, Yu Zhou and Zhixu Chen</i> NARI Group, China
10:45~11:00	788	Data-Driven Short-Term Voltage Stability Prediction Based on Pre-Fault Operating State <i>Wenlu Zhao, Yanling Du, Huaichang Ge, Haitao Liu, Qinglai Guo, Weimin Sun and Bin Wang</i> Tsinghua University, China

11:00~11:15	806	Smart Terminal Unit for Distribution Network with Model Verification Ability <i>Jian Hu, Wenlu Ji and Peifeng Shen</i> Nanjing Power Supply Company, State Grid Corporation of China, China
11:15~11:30	811	Data-driven Heuristic Optimization to Manage Congestion of Urban Power Grid <i>Youbo Liu, Xi Zhang, Hongjun Gao, Chengzhi Zhu and Yiyang Yao</i> Sichuan University, China
11:30~11:45	812	Transient Model Integrated Power Flow and Its Application in Electromagnetic Transient Simulation Initialization <i>Shaowei Huang, Wei Wei, Ye Liu, Yankan Song, Ying Chen, Lun Tang and Bo Zhou</i> Tsinghua University, China
11:45~12:00	871	Research on Power Supply Capability Evaluation and Optimization Method for Distribution Network with Electric Heating Loads <i>Mingxin Zhao, Hui Hui, Jian Su, Wei Liu and Tao Wei</i> China Electric Power Research Institute (CEPRI), China

TS32-Power Electronics and Control and Protection systems for Smart Grids-V

Session Chair: Yang Han, University of Electronic Science and Technology of China

Venue: Four Seasons Hall-3,4 (四季 3、4 厅)

Time	Paper ID	Title & Authors
10:30~10:45	711	Qualitative and Quantitative Analysis on AC-Side Perturbation Characteristics of Voltage-Source Converter <i>Wen Qian, Yueheng Zhao, Zhimin Wang, Kai Hu, Facai Xing and Zheng Xu</i> Zhejiang University, Hangzhou
10:45~11:00	723	A General Extended Theory of Interline DC Power Flow Controller <i>Xu Zhong, Miao Zhu, Yongning Chi and Xu Cai</i> Shanghaijiaotong University, China
11:00~11:15	730	A Control Strategy for Islanded Three-Phase Inverter with Nonlinear and Unbalanced Loads <i>Bo Wang, Chang Lu, Fujun Yang and Yang Han</i> University of Electronic Science and Technology of China, China
11:15~11:30	738	Impedance Model of MMC With CCSC and Sampling Delays <i>Congqi Yin, Xiaorong Xie, Chun Liu and Xiao Wang</i> Tsinghua University, China
11:30~11:45	743	APLL-based Harmonic Compensation Scheme for DFIG-based Wind Power Generation System <i>Fujun Yang, Bo Wang, Chang Lu, Yang Han, Xing Ning, Aiting Jiang and Mingyu Luo</i> University of Electronic Science and Technology of China, China
11:45~12:00	770	Analysis on Harmonic Resonance of Offshore Wind Farm Transmitted by MMC-HVDC system <i>Lingang Yang, Zhihui Xu, Lu Feng, Zheren Zhang, Zheng Xu and Facai Xing</i> Zhejiang University, Hangzhou

TS33-Computational Intelligence Applications, Information and Communication Technologies (ICT), and Cyber-Security-III

Session Chair: Xuzhu Dong, Electric Power Research Institute, China / Southern Power Grid Co., Ltd.

Venue: Elegance and Auspice Room (雅瑞厅)

Time	Paper ID	Title & Authors
10:30~10:45	446	AGC Strategy for Distributed Energy Storage Aggregator Based on Consensus Algorithm <i>Yibin Guan and Jihui Zhang</i> Southeast University, China
10:45~11:00	456	A novel solar irradiance forecast model using complex network analysis and classification modeling <i>Kai Lv, Fei Wang, Jianfeng Che, Weiqing Wang and Zhao Zhen</i> North China Electric Power University, China
11:00~11:15	483	Towards Ubiquitous Power Distribution Communication: Multi-service Access and QoS Guarantees for IoT Applications in Smart Grid <i>Liming Chen, Xuzhu Dong, Xiaoyun Kuang, Baoren Chen and Danke Hong</i> China Southern Power Grid, China
11:15~11:30	514	Ultra-Short Term Load Forecasting Based on Elman Neural Network <i>Pengyu Di, Kai Dong, Jiang Du, Chao Dong, Xiangzhen He, Yuheng Guan, Haixiang Gao, Jiaming Li and Yanjie Liang</i> Electric Power Dispatching Control Center of Guangdong Power Grid Co., Ltd., China
11:30~11:45	509	Enhancement of Power Equipment Management Using Knowledge Graph <i>Yachen Tang, Tingting Liu, Guangyi Liu, Jie Li, Renchang Dai and Chen Yuan</i> GEIRINA, United States
11:45~12:00	79	Big Data in Power Systems: An Introduction to Julia Linear Models using TensorFlow <i>Ebby Thomas</i> The University of Queensland, Australia

TS34- Renewable Generation and Distributed Energy Resources Integration-VI

Session Chair: Su Su, Beijing Jiaotong University

Venue: Brocade City Hall-3 (锦城 3 厅)

Time	Paper ID	Title & Authors
10:30~10:45	663	Active Power Control Strategy of Wind Power Outgoing Channel Considering Multiple Constraints and Target Limit <i>Jianbo Wang, Chen Wang, Yufei Rao, Chenghao Li, Yang Liu, Zhou Fang, Wei Cui and Weijun Teng</i> Electrical Power Research Institute of Henan Electric Power Corporation, China
10:45~11:00	683	Dynamic Equivalence Method of Wind Farm Considering the Wind Power Forecast Uncertainty <i>Longyuan Li, Yufei Teng, Xiaoru Wang and Qingyue Chen</i> Southwest Jiaotong University, China

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11:00~11:15	697	An Interoperable Building Energy Management System with IEEE1888 Open Protocol for Peak-Load Shaving <i>Phanumat Saatwong and Surapong Suwankawin</i> Chulalongkorn University, Thailand
11:15~11:30	716	Cost-Benefit Analysis of PV Penetration and its Impact on the Frequency Stability: Case Study of the South-Central Kalimantan System <i>Tatok Winarko, Nanang Hariyanto, Fathin Saifur Rahman, Masayuki Watanabe and Yasunori Mitani</i> PT PLN (Persero), Indonesia
11:30~11:45	726	Research and application of distributed storage technology in power grid enterprise database <i>Yan Gong, Yan Wu, Kejia Pan, Jian Chang and Jia Xu</i> State Grid Sichuan Information and Communication Company, China

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TS35- Grid Operation and Management -XIV

Session Chair: Zhenyuan Zhang, University of Electronic Science and Technology of China

Venue: Chamber of Mist (馨雨阁)

Time	Paper ID	Title & Authors
13:30~13:45	817	Application Research of Fiber Bragg Grating Sensing System in Condition Monitoring of Voltage Transformer <i>Fan Yang, Yan Gong, Yuqiang Fan, Qin Zhang, Xin Wang, Dou Wu and Huaihao Wei</i> Information & Communication Company, State Grid Sichuan Electric Power Company, China
13:45~14:00	827	A New Scheme of Substation Backup Protection Based on Topology Matrixes and Differential Zones <i>Yuxin Shi, Liang Wang, Huidong Guo, Da Lei and Qingmeng Meng</i> State Grid Shanxi Electric Power Research Institute, China
14:00~14:15	828	A Review on the Development of Concentrated Solar Power and its Integration in Coal-Fired Power Plants <i>Mojtaba Jabbari Ghadi, Li Li, Jiangfeng Zhang, Luan Chen, Qi Huang and Changhai Li</i> University of Electronic Science and Technology of China, China
14:15~14:30	833	The Application of Latent Feature Model in Power Equipment Evaluation <i>Yuqiang Fan, Ke Xu, Yaoran Huo, Yu Zeng, Huaihao Wei, Qin Zhang, Xin Wang and Jiazhou Li</i> Information and Communication Company, State Grid Sichuan Electric Power Company, China
14:30~14:45	855	Optimization of Entering Path for Equipotential Live Work on ± 800 kV UHV DC Line <i>Yuanjie Jiang, Yadi Zhang, Wencheng Sun, Ke Yang and Zehua Huang</i> State Grid Nantong Power Supply Company, China

14:45~15:00	859	Study on a Novel Fully Automatic Transformer Calibrator Overall Test Device <i>Na He, Kun Liu, Hao Wang, Gang Liu, Xianshun Chen and Ruihan Wang</i> State Grid Sichuan Electric Power Corporation Metering Center, China
15:00~15:15	866	The Application of Equipment Overheating and Arcing Fault Warning and Protection Systems of Switchgear in Power Systems <i>Qiang Wang and Peng Qiu</i> Jinzhou Power Supply Branch, State Grid Liaoning Electric Power Supply Co., Ltd, China

TS36- Power Electronics and Control and Protection systems for Smart Grids-VI

Session Chair: Yuefang Du, University of Electronic Science and Technology of China

Venue: Chamber of Dew (浣花轩)

Time	Paper ID	Title & Authors
13:30~13:45	824	Simulation Research on Switching Process of Reactive Power Equipment in DC Converter Station <i>Xinglong Wu, Zheng Xu and Jian Yang</i> Zhejiang University, China
13:45~14:00	830	Active Power Sharing Performance Analysis of Consensus-Based Control Considering Continuous Disturbances in AC Microgrids <i>Sicheng Deng, Lajun Chen, Xiaonan Lu, Libin Yang, Tianwen Zheng and Shengwei Mei</i> Tsinghua University, China
14:00~14:15	849	A Non-Iterative Switching Status Combination Judgement Algorithm for Half-Bridge Sub-Circuit Based Voltage-Source Converters in EMTP-type Simulation Program <i>Rui Zhang, Yankan Song, Zhitong Yu, Ying Chen and Shaowei Huang</i> Tsinghua Sichuan Energy Internet Research Institute, China
14:15~14:30	852	Optimal Control of Three-level Dual Active Bridge DC-DC Converter Under Dual Phase-shifted Modulation <i>Wang, Alian Chen and Song</i> Shandong University, China
14:30~14:45	882	Fractional Phase Lead Compensation for PIMR-type Repetitive Control on a Grid-tied Inverter <i>Sainan Chen, Qiangsong Zhao, Xiaolei Wang, Dongyun Wang and Xiaohui Lu</i> Zhongyuan University of Technology, Zhengzhou
14:45~15:00	915	Non-Invasive Electromagnetic Sensor for Residential Harmonic Distortion <i>Qihang Gong, Guangchao Geng and Quanyuan Jiang</i> Zhejiang University, China
15:00~15:15	939	Power Quality Disturbance Detection of DC Distribution Network Based on Tsallis Wavelet Entropy <i>Xian Wu, Hongkun Chen and Qing Chen</i> Wuhan University, China
15:15~15:30	953	Fault Location for HVDC Transmission Lines Using Interference Cancellation <i>Yongchao Sun, Mei Sun, Zhenchao Jiang, Yufei Teng, Peng Zhang, Xiaopeng Li and Rongsen Luo</i> State Grid Sichuan Electric Power Research Institute, China

TS37- Renewable Generation and Distributed Energy Resources Integration-VII

Session Chair: Mengmeng Cao, Hohai University

Venue: Chamber of Dialogue (相语堂)

Time	Paper ID	Title & Authors
13:30~13:45	729	Multi-objective Optimal Strategy for the Coordination Control between Distributed Energy Storage System and Flexible Load <i>Fei Juntao, Yuan Xiaodong, Xu Qingqiang, Shi Mingming and Xiao Yuhua</i> State Grid Jiangsu Electric Power Co., LTD. Research Institute, China
13:45~14:00	731	Distributionally Robust Generation Expansion Planning Model Considering RES Integrations <i>Xuejiao Han and Gabriela Hug</i> ETH Zurich, Switzerland
14:00~14:15	732	A New Form of User Power Supply System Promoted by Distributed Electric Resources <i>Xiangqian Tong, Minghang Zhong, Qiao Ma and Xiaoyun Sun</i> Xi'an University of Technology, China
14:15~14:30	742	Active Distribution Network Energy Management with Cooperative Scheduling of Multi-microgrids <i>Lining Hu, Zhihui Dai, Shuqiang Zhao, Jiefu Tian and Bingyan Chen</i> North China Electric Power University, China
14:30~14:45	749	Capacity Determination of the DC-side Battery for Hybrid Batteries in PV Generation System <i>Shinya Hashimoto, Nozomi Tobaru, Toshikazu Yamamoto and Koichi Nara</i> National Institute of Technology, Fukushima College, Japan
14:45~15:00	754	Optimized Capacity Configuration of Photovoltaic Generation and Energy Storage for Residential Microgrid <i>Yongqiang Zhu, Quan Zhang, Kang Liu, Minxiao Han, Qing Chen and Yang Liu</i> North China Electric Power University, China
15:00~15:15	767	Node Net Load Forecasting of Distributed Photovoltaic Considering Different User Characteristics <i>Mengmeng Cao, Linjun Shi, Zizhao Wang, Ladiier Fa, Weiyuan Wang, Fei Dou, Junhui Huang and Quanquan Wang</i> Hohai University, China
15:15~15:30	933	Emerging Technologies in Regional Energy Internet based battery energy storage performance analysis method <i>Tianjiao Zhang, Xisheng Tang and Li Kong</i> Institute of Electrical Engineering Chinese Academy of Sciences, China

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TS38- Electricity Market, Innovative Business Mechanism, Policy/Regulatory Aspects-III

Session Chair: Zhifang Yang, Chongqing University

Venue: Chamber of Peony (牡丹亭)

Time	Paper ID	Title & Authors
13:30~13:45	468	Energy Storage-Transmission Line Planning Based on Complete Information Static Game Model <i>Cai Sun, Laijun Chen, Liufang Wang, Wei Wei, Tianwen Zheng and Shengwei Mei</i> Tsinghua University, China
13:45~14:00	493	Dynamic Analysis of Operating Reserve Demand Curve in Energy-Only Electricity Markets <i>Sreelatha Aihloor Subramanyam, Xuwei Zhang, Jinjie Wu and Huihui Song</i> Harbin Institute of Technology-Weihai, China
14:00~14:15	508	Agent-Based Models in Electricity Markets: A Literature Review <i>Priyanka Shinde and Mikael Amelin</i> KTH Royal Institute of Technology, Sweden
14:15~14:30	662	System Frequency Performance of the Australian National Electricity Market with Energy Transformation <i>Shilpa Kala, John Fletcher, Jahan Peiris and Ahmad Shabir Ahmadyar</i> University of New South Wales, Australia
14:30~14:45	698	Demand for Energy Storage: Case Studies for Chinese Power System in 2035 and 2050 <i>Mingliang Cao, Guohe Li, Yong Sun, Wei Xu, Xiaorong Xie, Jie Sheng and Hao Nan</i> Beijing Zhuozhi Energy Research Technology Co., Ltd., China
14:45~15:00	809	Self-learning Prosumer in Competitive Local Energy Market <i>Tao Chen, Can Huang, Fengkai Hu, Junbo Zhao and Wencong Su</i> University of Michigan-Dearborn, USA
15:00~15:15	865	Transformer Apparent Age Estimation Based on Probabilistic Health Index <i>Shuaibing Li and Haiying Dong</i> Lanzhou Jiaotong University, China

TS39- Emerging Technologies and End-user Systems-VI

Session Chair: Dongsheng Cai, University of Electronic Science and Technology of China

Venue: Chamber of Blossom (梅兰阁)

Time	Paper ID	Title & Authors
13:30~13:45	841	Peak shaving of an EV Aggregator Using Quadratic Programming <i>Seo Mingyu, Kim Chunghun and Han Sekyung</i> Kyungpook National University, Republic of Korea
13:45~14:00	895	Optimal Electric Bus Charging Scheduling for Local Balancing of Fluctuations in PV Generation <i>Jakub Szczesniak, Tobias Massier, Marc Gallet and Anurag Sharma</i> TUMCREATE, Singapore
14:00~14:15	912	Optimal Coupling of Multiple Microgrid Clusters <i>Md Asaduzzaman Shoeb, Farhad Shahnian and Gm Shafiullah</i> Murdoch University, Australia

14:15~14:30	926	Energy Management for Standalone DC Microgrid Using Artificial Bee Colony <i>Shehab Al-Sakkaf, Mahmoud Kassas and Muhammad Khalid</i> KFUPM, Saudi Arabia
14:30~14:45	966	Blockchain Based Domestic Appliances Scheduling in Community Microgrid <i>Muhammad Afzal, Khalid Umer, Waqas Amin, Muhammad Naeem, Zhang Zhenyuan, Dongshang Cai and Qi Huang</i> University of Electronic Science and Technology of China, China
14:45~15:00	970	Belief Propagation and H-infinity Controller for Microgrid State Estimation and Stabilization Using Internet of Things Technologies <i>Md Rana and R. Bo</i> Missouri University of Science and Technology, United States
15:00~15:15	979	Noise suppression in compressive imaging for power internet of things <i>Yaoran Huo, Jian Chang, Cheng Liu, Jiazhou Li, Xuan Xu, Fan Yang and Yu Zeng</i> State Grid Sichuan Electric Power Company, China
15:15~15:30	1009	Modeling and Simulation of Virtual Synchronous Generator for Photovoltaic Inverter <i>Shunlai Wang, Qiongfeng Zhu, Shouhong Feng, Yufeng Wang, Zixiao Xu, Jingru Yang, Bowen Zhang and Weilin Li</i> Northwestern Polytechnical University, China

TS40- Renewable Generation and Distributed Energy Resources Integration-VIII

Session Chair: Jianbo Yi, University of Electronic Science and Technology of China

Venue: Chamber of Lotus (芙蓉居)

Time	Paper ID	Title & Authors
13:30~13:45	775	Optimal Capacity Allocation of Renewable Energy Generation Base for Small Signal Stability Improvement <i>Huiyu Liang, Shuanbao Niu, Xianbo Ke, Chao Huo, Jili Wang, Gang Zhang and Huanhai Xin</i> Zhejiang University, China
13:45~14:00	778	Wind Energy Conversion Systems and Artificial Neural Networks: Role and Applications <i>Jaber Alshehri, Ahmed Alzahrani and Muhammad Khalid</i> King Fahd University of Petroleum & Minerals, Saudi Arabia
14:00~14:15	786	Available Inertia Estimation of Induction Machine and Its Effect on Frequency Response of Power Systems with Wind Penetration <i>Ding Wang, Xiaoming Yuan, Yangwu Shen, Ting Cui, Zhen Hu, Wei Cao and Long Li</i> State Grid Hunan Electric Power Company Limited Research Institute, China
14:15~14:30	799	Analysis of Aggregated Wind Power Dependence Based on Optimal Vine Copula <i>Yundai Xu and Yue Yuan</i> Hoihai University, China
14:30~14:45	813	Optimal Locating and Sizing the Energy Storage System Considering the Reconfigurability of the High Voltage Distribution Network in Urban Grids <i>Xi Zhang, Youbo Liu, Xinran Yang, Fangfang Liu, Chengzhi Zhu and Yiyang Yao</i> Sichuan University, China

14:45~15:00	819	Energy Management Strategy of Smart Residential Community Considering Aggregated Air-conditioning Loads <i>Shuifu Gu, Kejun Qian, Jie Li, Jie Song and Hongwei Shen</i> NARI Technology Development Co., Ltd, China
15:00~15:15	823	Distribution Network Economic Dispatch Based on Network Reconfiguration and Electric-heat Combined Demand Response <i>Yue Guo, Juan Zhao, Shiyuan Ni and Xiangyu Kong</i> State Grid Economic and Technological Research Institute Co., Ltd, Beijing
15:15~15:30	831	Generation Scheduling Optimization of Wind-Storage Combined Generation System Based on Combined Empirical Mode Decomposition (CEMD) <i>Jie Shi, Xiaofei Liu, Xingong Cheng and Xiju Zong</i> University of Jinan, China

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TS41- Grid Operation and Management -XV

Session Chair: Yuefang Du, University of Electronic Science and Technology of China

Venue: Chamber of Mist (攀雨阁)

Time	Paper ID	Title & Authors
16:00~16:15	120	Modeling PV/PQ switching in security constrained optimal power flow <i>Yunkai Lei, Ronghua Wang, Ting Li, Quan Tang, Yunling Wang and Jinyang Li</i> State Grid Sichuan Economic Research Institute, China
16:15~16:30	890	Internal state estimation for distribution network with PMU measurement information <i>Li Yu, Xiangyu Kong and Ying Chen</i> Electric Power Research Institute China Southern Power Grid Company Limited, China
16:30~16:45	937	Simulation modeling of high impedance transformer based on PSACD with deep correlation of winding structure <i>Yuanlin Pan, Xianggen Yin, Wenbin Cao, Yongxin Chen, Xiangyuan Yin and Yuxue Wang</i> Huazhong University of Science and Technology, China
16:45~17:00	975	The Application of Non-Invasive Sensor in Unbalanced Three-Phase Current Detecting <i>Ke Zuo, Guangchao Geng and Quanyuan Jiang</i> Zhejiang University, China
17:00~17:15	751	Design of Online Detection System for Insulation Resistance of Electric Vehicle Based on Unbalanced Bridge <i>Yongpeng Shen, Ankang Liu, Guangzhao Cui and Gaorui Ge</i> Zhengzhou University of Light Industry, China
17:15~17:30	776	A Dynamic Equivalent Method of Three-Sequence Network for Electromagnetic Transient Simulation <i>Linchao Yang, Boliang Lou, Zheng Xu, Hua Zhou and Wen Hua</i> Zhejiang University, China

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17:30~17:45	904	The Full Frequency-domain Transient Recorder and the Analysis System <i>Xuanwei Qi, Liexiang Hu, Chengyu Lu, Yutao Qiu, Song Wang and Baoxing Shen</i> State Grid Zhejiang Electrical Power Research Institute, China
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TS42- Power Electronics and Control and Protection systems for Smart Grids-VII

Session Chair: Di Cao, University of Electronic Science and Technology of China

Venue: Chamber of Dew (浣花轩)

Time	Paper ID	Title & Authors
16:00~16:15	995	A robust and resilient voltage control strategy for smart distribution grids <i>Rajkumar Palaniappan</i> Technische Universität Dortmund, Germany
16:15~16:30	1001	Mathematical Model of Four-Winding Inductive Filtering Converter Transformer and Its Application <i>Jing Sun, Longfu Luo and Zhao Huang</i> Hunan University, China
16:30~16:45	1006	Restoration of a Meshed HVDC Grid with Non-selective Protection Strategy <i>Qi Zhang, Zhou Liu and Zhe Chen</i> Aalborg University, Denmark
16:45~17:00	695	Power Quality Improvement Device for Medium-voltage Distribution Network <i>Wei Hu, Yu Shen, Min Zhang, Fan Yang and Yang Lei</i> State Grid Hubei Electric Power Research Institute Department of distribution, China
17:00~17:15	846	Research on the Key Technologies of Battery Energy Storage Power Station for Plug and Play Operation <i>Anping Hu, Guanjun Li, Ting Yang, Liang Zhang, Henghua Shui and Chen Fang</i> Nanjing Institute of Technology, China

TS43- Renewable Generation and Distributed Energy Resources Integration-IX

Session Chair: Dongsheng Cai, University of Electronic Science and Technology of China

Venue: Chamber of Dialogue (相语堂)

Time	Paper ID	Title & Authors
16:00~16:15	836	Optimal Allocation of Photovoltaic in The Hybrid Power System using Knapsack Dynamic Programming <i>Anindita Satria Surya, Philipp Awater, Musa Partahi Marbun and Nanang Hariyanto</i> PT PLN (Persero); School of Electrical Engineering and Informatics, Institut Teknologi Bandung, Indonesia
16:15~16:30	873	Research on Estimation of Regional Distributed Photovoltaic Output Based on K-medoids Algorithm <i>Wu Ji, Cheng Xu, Zhu Xiang, Zhou Hai and Cui Fang</i> China Electric Power Research Institute Ltd., NanJing
16:30~16:45	880	Multi-Objective Optimal DG Sizing and Placement in Distribution Systems Using Particle Swarm Optimization <i>Yahaya Abass, Mohammad Abido, Mohammad Almuahini and Muhammed Khalid</i> King Fahd University of Petroleum and Minerals, Saudi Arabia

16:45~17:00	888	Optimal Dispatching Strategy for Active Distribution System Considering Network Reconfiguration <i>Zhiyong Yuan, Xiangyu Kong and Chengsi Yong</i> Electric Power Research Institute China Southern Power Grid Company Limited, China
17:00~17:15	896	A Planning Method of Distributed Generations for Promoting Renewable Energy Utilization in the Coupled Network <i>Huifang Yao, Yong Li, Xia Shao, Yu Zhang and Xuebo Qiao</i> Hunan University, China
17:15~17:30	898	Dynamic Conductor Temperature Modelling and Analysis of a Distribution Network with PV <i>Arif Ahmed, Fiona Stevens McFadden, Ramesh Rayudu and Tobias Massier</i> TUMCREATE, Singapore
17:30~17:45	901	An Optimization Method Based on Time-Sharing Energy Complementation to Determine Transmission Capacity of Wind-CSP Plants Combined System <i>Yang Cui, Huiquan Zhang, Siyu Huang and Boyang Xu</i> Northeast Electric Power University, China
17:45~18:00	922	An Integrated Operation Strategy of Energy Storage System in ADN Planning <i>Yunfei Zheng, Yingxiang Wang, Jiong Yan, Chenying Yi, Weiwei Lin, Yue Ning, Zhi Chen and Zhijian Hu</i> Wuhan University, China

TS44- Grid Operation and Management -XVI
Session Chair: Zhifang Yang, Chongqing University
Venue: Chamber of Peony (牡丹亭)

Time	Paper ID	Title & Authors
16:00~16:15	876	Load Flow Calculation Considering Droop Control in Distribution Networks: A Convex Optimization Approach <i>Weiye Zheng, David Hill and Wenchuan Wu</i> The University of Hong Kong, China
16:15~16:30	889	Interval-Based Decentralized Dispatch Method for Coupled Transmission-Distribution System <i>Peng Li, Ming Yang, Jiajun Yang, Bin Zhao, Yi Zhu and Liangjing Cao</i> Shandong University, China
16:30~16:45	910	Power system transient stability margin assessment using steady-state information <i>Jun An, Mu Gang, Zonghan Li and Daowei Liu</i> Northeast Electric Power University, China
16:45~17:00	914	Minimizing Active Power Losses in Electricity Networks Based on Optimal Location of Battery Energy Storage System <i>Salem Alshahrani, Muhammad Khalid and Mohammad Almuahaini</i> King Fahd University of Petroleum and Minerals, Saudi Arabia
17:00~17:15	984	Graph Computing based Fast Screening in Contingency Analysis <i>Yiting Zhao, Chen Yuan, Sun Li, Guangyi Liu, Renchang Dai and Zhiwei Wang</i> GEIRI North America, United States

17:15~17:30	985	Fast Grid Splitting Detection for N-1 Contingency Analysis by Graph Computing <i>Yongli Zhu, Lingpeng Shi, Renchang Dai and Guangyi Liu</i> GEIRI North America
17:30~17:45	203	Hybrid HVDC system parameters tuning based on Robust Multi-Objective Optimization via Evolutionary Algorithms <i>Jia Yang, Hongtao Yang, Fenqing Wei, Weiliang Li, Qipu Liu and Guoqiang Sun</i> Hohai University, China
17:45~18:00	736	Research on load rejection protection of PWR power plants at different power levels <i>Wei Sheng and Zheng Xu</i> Zhejiang University, China

TS45- Renewable Generation and Distributed Energy Resources Integration-X

Session Chair: Jianbo Yi, University of Electronic Science and Technology of China

Venue: Chamber of Lotus (芙蓉居)

Time	Paper ID	Title & Authors
16:00~16:15	942	Research on adjustment and utilization strategy of transformer in distribution network based on safety efficiency cost <i>Chao Xing, Xinze Xi, Mingqun Liu and Shengnan Li</i> Electric Power Research Institute of Yunnan Power Grid Co., Ltd, China
16:15~16:30	943	State-evaluation & Risk-assessment based Maintenance Resource Allocation Method for Distribution Networks <i>Linbo Wang, Fengsheng Yang and Zhirui Wang</i> Tianjin University, China
16:30~16:45	945	Real-Time Dispatch of Flexible Ramping Products for Energy Storage and Demand Response <i>Yuzhou Zhao</i> The University of Hong Kong, Hong Kong
16:45~17:00	954	An Overview of Planning Technology for Active Distribution Network <i>Rongjian Cui, Hui Hou, Xiangtian Deng, Zhenfeng Xiao, Peizhe Xin, Tao Xu and Peng Liu</i> School of Automation Wuhan University of Technology, China
17:00~17:15	957	Flexible Coordinated Planning of Electricity-gas Integrated Distribution System Considering Demand Side Management <i>Huiru Wang, Weihua Liao, Jianlian Zhang and Chuangxin Guo</i> College of Electrical Engineering, Zhejiang University, China
17:15~17:30	973	Reliability Improvement in Radial Distribution System through Reconfiguration <i>Srividhya Pattabiraman, Kirithikaa Sampath, Mounika Kannan, Girish Ganesan R and Narayanan K</i> Sastra Deemed University, India
17:30~17:45	990	Stability Analysis of N-Paralleled Photovoltaic Grid-connected DC Systems <i>Yue Li and Yonggang Peng</i> Zhejiang University, China

17:45~18:00	71	Solving Optimal Reactive Power Dispatch Problem Considering Load Uncertainty <i>Salah Kamel, Said Abdel-Fatah, Mohamed Ebeed, Juan Yu, Kaigui Xie and Chenyu Zhao</i> Chongqing University, China
18:00~18:15	997	Optimized Planning of P2G Plant in Integrated Electricity and Natural Gas System <i>Kaige Hu, Jian Li, Xiao Xu, Weihao Hu, Qi Huang, Zhe Chen, Shuwen Xu and Dechao Xu</i> UESTC, China

Special Sessions

08:30-10:00 | FRIDAY, MAY 24

SS09-Smart DC Distribution Systems

Session Chairs: Miao Yu, Zhejiang University

Xia Chen, Huazhong University of Science & Technology

Venue: Chamber of Mist (馨雨阁)

Time	Paper ID	Title & Authors
08:30~08:45	484	A Two-Stage Improved Droop Control Method for Economic Operation of Islanded DC Microgrids <i>Fengzhou Sun, Pengcheng Yang, Jie Zhu, He Zhao, Miao Yu and Wei Wei</i> Zhejiang University, China
08:45~09:00	510	Optimal Hierarchical Voltage Control for VSC-MTDC Distribution Network <i>Lawrence Bibaya, Chongru Liu and Gengyin Li</i> North China Electric Power University, China
09:00~09:15	591	Overall Control Architecture of VSC based MV and LVDC Distribution and Utilization Systems <i>Qing Chen, Yizhen Wang, Haitao Liu, Yu Ji, Xiong Xiong, Dong Yuan, Xinyao Si and Xiaolong Xiao</i> Tianjin University, China
09:15~09:30	611	Distributed Dual-Loop Active Disturbance Rejection Control for DC Microgrids <i>Chun Wei, Jianqi Xu, Yangwu Shen and Youbing Zhang</i> Zhejiang University of Technology, China
09:30~09:45	656	Risk Analysis and Study of Wind Turbines Off-Grid Based on AC/DC Hybrid Grid <i>Yuhang Luo, Wei Zhang, Hualing Han, Quan Li, Yuqiu Zhou and Peifeng Xi</i> University of Shanghai for Science and Technology, China
09:45~10:00	702	Nonlinear Power Flow Calculation of Offshore Oilfield Power Grid Based on Improved PSO Algorithm <i>Yansong Wang, Zhiqiang Lu and Qiang Li</i> China University of Petroleum, China

SS10-Ancillary Services Provided by Wind Power

Session Chairs: Haoran Zhao, Shandong University

Hongtao Wang, Shandong University

Venue: Chamber of Dew (浣花轩)

Time	Paper ID	Title & Authors
08:30~08:45	240	Wind Power Fluctuation Smoothing with BESS Considering Ultra-short-term Prediction <i>Yawen Zhao, Xiaohan Shi, Boxi Zhou and Xiaolei Wang</i> Shandong University, China

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08:45~09:00	244	Reactive Power Optimization of Wind Farm Considering Reactive Power Regulation Capacity of Wind Generators <i>Ying Wang, Tao Wang, Kunpeng Zhou, Kan Cao, Defu Cai, Haiguang Liu and Chu Zhou</i> State Grid Hubei Electric Power Research Institute, China
09:00~09:15	348	A Fast Frequency Control Strategy for Deloaded WTG in the Power System with High Penetration of Renewable Energy <i>Jiixin Hu, Chong Shao, Weizhou Wang, Guoyi Xu, Dong Caihong and Tianshu Bi</i> North China Electric Power University, China
09:15~09:30	916	Pitch Control Strategy of Permanent Magnet Synchronous Wind Turbine Generator in Response to Cluster Auto Generation Control Command <i>Yang Cui and Peng Zeng</i> Northeast Electric Power University, China
09:30~09:45	52	Improvement of Fault Ride Through Capability of DFIG-based Wind Turbine Systems Using Superconducting Fault Current Limiter <i>Muhammad Sarwar, Babar Hussain, Asad Hussain and Muhammad Abubakar</i> Pakistan Institute of Engineering and Applied Sciences Islamabad, Pakistan

SS11-Risk Assessment and Planning of Power Systems Integrated with High Penetration of Renewable Energies

Session Chairs: Bo Hu, Chongqing University

Kaigui Xie, Chongqing University

Venue: Chamber of Dialogue (相语堂)

Time	Paper ID	Title & Authors
08:30~08:45	137	Comparative Study of Partial Discharge (PD) Signal Characteristics in Insulation Systems filled with Mineral and Ester Oil <i>Anupam Dixit and Sameera Samarasinghe</i> The University of Queensland, Australia
08:45~09:00	347	A power flow tracing based load curtailment technique <i>Tao Wu, Bo Hu, Kaigui Xie, Heng-Ming Tai, Shuocheng Wang and Bo Li</i> Chongqing University, China
09:00~09:15	397	Simulation of pv grid-connected inverter based on pscad <i>Jian Zhang, Fang Lin, Weijun Zhang, Yi Zhang and Zhengxin Ruan</i> Fuzhou University, China
09:15~09:30	791	Estimation of Offshore Wind Farm Reliability Considering Wake Effect and Wind Turbine Failure <i>Angshu Nath, Santanu Paul, Zakir Rather and Sadhan Mahapatra</i> Tezpur University, India
09:30~09:45	879	Interval Electrical Betweenness Method for Power Grid Vulnerability Assessment Considering Wind Power <i>Lijuan Li, Zhiqiang Liu, Mao Tan, Yuan Li, Jian Zhou and Jun Wu</i> Xiangtan University, China

SS12-Big Data Analytics, Modern Artificial Intelligence and Advanced Optimization Technologies in Power and Integrated Energy Systems-I

Session Chairs: Zhenzhi Lin, Zhejiang University

Fushuan Wen, Zhejiang University

Venue: Four Seasons Hall-1,2 (四季 1、2 厅)

Time	Paper ID	Title & Authors
08:30~08:45	127	Hybrid Energy Storage System in Naval Vessel with 2-Stage Power-sharing Algorithm <i>Hein Kyaw and Yan Xu</i> Nanyang Technological University, Singapore
08:45~09:00	128	A Hierarchical Fuzzy Method for Power-Electronic Inverter Evaluation <i>Hein Kyaw and Yan Xu</i> Nanyang Technological University, Singapore
09:00~09:15	130	Influence Analysis of Voltage Loss on Similarity Calculation <i>Zeyang Tang, Xiaodong Yu, Lei Wan, Jie Xing, Hongyan Zhou, Kan Cao, Xin Shu, Bingke Yan, Defu Cai, Li Wan and Kunpeng Zhou</i> Electric power research institute state grid Hubei Electric Power Co., Ltd, China
09:15~09:30	460	BIRCH Algorithm and Wasserstein Distance Metric Based Method for Generating Typical Scenarios of Wind Power Outputs <i>Qiushi Li, Xianghua Tang, Changming Chen, Xinyi Liu, Shengyuan Liu, Xiongjie Shi, Hui Liu, Zhong Li, Zhenzhi Lin, Li Yang and Fushuan Wen</i> Zhejiang University, China
09:30~09:45	522	Optimal Operation Strategy for an Integrated Low-Carbon Energy System in Coupled Electricity and Natural Gas Markets <i>Yuan Yan, Zihan Lin, Fushuan Wen, Ivo Palu, Xixiang Chen, Weimin Zheng and Lijun Zhang</i> Zhejiang University, China
09:45~10:00	536	Optimal Design of Energy Hubs in an Integrated Energy System Considering Contingencies in Critical Branches <i>Zihan Lin, Yuan Yan, Fushuan Wen, Ivo Palu, You Xue, Chenbo Xu, Lijun Zhang and Yikai Sun</i> Zhejiang University, China

Special Sessions

10:30-12:00 | FRIDAY, MAY 24

SS13-Emerging Technologies in Regional Energy Internet

Session Chair: Xuanyuan (Sharon) Wang, State Grid Jibei Electric Power Company

Venue: Chamber of Dew (浣花轩)

Time	Paper ID	Title & Authors
10:30~10:45	560	Potential Evaluation of Distributed Energy Resources with Affine Arithmetic <i>Lin Cheng, Ning Qi, Yan Fei Guo, Nan Liu and Wei Wei</i> Department of Electrical Engineering, Tsinghua University, China

10:45~11:00	727	A Review on Virtual Power Plant Concept, Application and Challenges <i>Xuanyuan Wang, Zhen Liu, Jianlei Shi, Yunhao Zhao, Hao Zhang and Huajie Ding</i> North Chian Electric Power University, China
11:00~11:15	746	Application of AC/DC Distribution Network Technology Based on Flexible Substation in Regional Energy Internet <i>Xiaofei Wang, Rui Chen, Jun Ge, Tianzhi Cao, Feng Wang and Xiaolin Mo</i> State Grid Jibei Electric Power Company, China
11:15~11:30	779	A Peak Regulation Ancillary Service Optimal Dispatch Method of Virtual Power Plant Based on Reinforcement Learning <i>Ya Liu, Xuanyuan Wang and Deliang Zhang</i> Beijing QU Creative Technology Co., Ltd., China
11:30~11:45	908	Integrated Demand Response in Multi-Energy Market Based on Flexible Loads Classification <i>Peiyun Liu, Tao Ding, Yuankang He and Tianen Chen</i> Xi'an Jiaotong University, China
11:45~12:00	924	EV charging coordination via blockchain-based charging power quota trading <i>Jian Ping, Sijie Chen, Zheng Yan, Haoran Wang, Liangzhong Yao and Minhui Qian</i> Shanghai Jiao Tong University, China

SS14-Research on Key Technologies of Optimization Management and Energy Transaction of the Distributed Resource Under the Electricity-Sold Side Liberalization

Session Chair: Dan Wang, Tianjin University

Venue: Chamber of Dialogue (相语堂)

Time	Paper ID	Title & Authors
10:30~10:45	506	A Novel Pricing Scheme for Peer-to-Peer Energy Trading Based on Evaluation Mechanism in Microgrid <i>Wang Dan, Su Peng-Fei and Yang Qi</i> Tianjin University, China
10:45~11:00	867	Comparison on Three Unscented Transformation Methods for Solving Probabilistic Load Flow <i>Sui Peng, Xi Pang, Huixiang Chen, Xingyu Lin, Yong Lin, Zhengmin Zuo, Hao Yu and Junjie Tang</i> Chongqing University, China
11:00~11:15	909	Research on Evaluation Indicators System for Electricity Market in China <i>Xiaocen Xue, Changyou Zhou, Yeyang Zhu, Zehong Li and Yangchao Zeng</i> Huadian Electric Power Research Institute Co., Ltd., China
11:15~11:30	938	Integrated Flexible Resources and Energy Markets in the Danish Multi-energy System <i>Yufei Xi, Jiakun Fang, Zhe Chen, Henrik Lund, Søren Møller Thomsen, Anders Dyrelund and Per G Kristensen</i> Aalborg University, Denmark
11:30~11:45	950	A P2P Trading Mechanism of Distributed PV Based on Continuous Matching <i>Jiang Sifan, Can Wan, Jia Yanbo and Song Yonghua</i> Zhejiang University, China

11:45~12:00	1011	Smart Micro-Grid: An Immediate Solution to Nigeria's Power Sector Crisis <i>Olusola Bamisile, Huang Qi, Weihao Hu and Olufunso Alowolodu</i> University of Electronic Science and Technology of China, China
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SS15-Big Data Analytics, Modern Artificial Intelligence and Advanced Optimization Technologies in Power and Integrated Energy Systems-II

Session Chairs: Zhenzhi Lin, Zhejiang University

Fushuan Wen, Zhejiang University

Venue: Four Seasons Hall-1,2 (四季 1、2 厅)

Time	Paper ID	Title & Authors
10:30~10:45	544	Real-time Dispatch with Flexible Ramping Products in a Power System with High Penetration of Renewable Energy Generation <i>Hongji Lin, Qing Deng, Fushuan Wen, Ivo Palu, Jiahua Hu, Li Ma and Shengjiang Peng</i> Zhejiang University, China
10:45~11:00	570	Investigation on the Accommodation Capability of a Distribution System for Electric Vehicles considering System Flexibility <i>Qing Deng, Yuanxiang Wang, Fushuan Wen, Weimin Zheng, Pan Dai and Yang Zhang</i> Zhejiang University, China
11:00~11:15	625	Combined Use of Support Vector Machine and Extreme Gradient Boosting System for Cost Prediction of Ultra High Voltage Transmission Projects <i>Yuanxiang Wang, Qing Deng, Fushuan Wen, Hongyu Zhou, Fuyan Liu, Xiaoyong Yang</i> Zhejiang University, China
11:15~11:30	630	Resilience Enhancement for a Power System with Electric Vehicles Under Extreme Weather Conditions <i>Fang Yao, Jiawei Wang and Fushuan Wen</i> Shanxi University, China
11:30~11:45	654	Response-Based Adaptive Under-Voltage Load Shedding Using Oblique Energy Decision Tree <i>Lipeng Zhu, Chao Lu and Yonghong Luo</i> Tsinghua University, China
11:45~12:00	661	Interval state estimation with Limited PMU against False Data Injection Attack <i>Ting Yang and Huaizhi Wang</i> Shenzhen University, China
12:00~12:15	797	Online Operation of Battery Energy Storage System for Demand Charge Reduction Considering Degradation <i>Zhenhuan Ding, Ziang Zhang and Tianqiao Zhao</i> Binghamton University, United States

FRIDAY, MAY 24

Special Sessions

13:30-15:30 | FRIDAY, MAY 24

SS16-Planning and Operation of Smart Distribution Network with High Penetration of Distributed Energy Resources and Electric Vehicles-I

Session Chairs: Shenxi Zhang, Shanghai Jiao Tong University

Yue Xiang, Sichuan University

Venue: Brocade City Hall-1,2 (锦城 1、2 厅)

Time	Paper ID	Title & Authors
13:30~13:45	105	Sizing Approach of Distributed Energy Storage System in the Presence of Aggregators <i>Youbo Liu, Yue Xiang, Zao Tang, Quan Tang, Weiting Xu and Mingjuan Wang</i> Sichuan University, China
13:45~14:00	319	Research on Operation Optimization Method of Regional Integrated Energy System <i>Xiaochen Zhang, Dongmei Yang, Wei Du, Yonghua Chen and Guoxin He</i> NARI Group Corporation (State Grid Electric Power Research Institute), China
14:00~14:15	424	A Coordinated Charging Strategy on Battery Swapping Station in Microgrid Considering Battery to Grid <i>Hongwang Yang, Chunlin Guo, Jinwei Ren and Jie Sheng</i> North China Electric Power University, China
14:15~14:30	581	Operational Performance and Economic Analysis of Three PV Tracking Technologies in an Australian PV Plant <i>Junying Wong, Feifei Bai, Muhammad Hafidz B. Khairudin and Rodney H.G. Tan</i> The University of Queensland, Australia
14:30~14:45	616	Line Outage Detection and Localization via Synchrophasor Measurement <i>Xianda Deng, Desong Bian, Di Shi, Wenxuan Yao, Zhihao Jiang and Yilu Liu</i> Univ of Tenn and Oak Ridge Nat Lab, United States
14:45~15:00	641	Short-term Load Forecasting at Different Aggregation Levels with Predictability Analysis <i>Yayu Peng, Yishen Wang, Xiao Lu, Haifeng Li, Di Shi, Zhiwei Wang and Jie Li</i> GEIRI North America, United States
15:00~15:15	648	Method of energy station capacity configuration for residential district-level integrated energy system considering virtual energy storage <i>Jiawei Lv, Shenxi Zhang, Haozhong Cheng, Kai Yuan, Yi Song, Chongbo Sun and Heng Zhang</i> Shanghai Jiao Tong University, China

FRIDAY, MAY 24

SS17-Artificial Intelligence for Smart Grid and Sustainable Energy Systems-I

Session Chairs: Bowen Zhou, Northeastern University

Zhile Yang, Chinese Academy of Sciences

Siqi Bu, Hong Kong Polytechnic University

Mingjian Cui, Southern Methodist University

Venue: Elegance and Auspice Room (雅瑞厅)

Time	Paper ID	Title & Authors
13:30~13:45	132	Electrical Equipment Inspection Process Intelligently Tailoring Based on Graph Planning <i>Li Jieshan and Zhang Changhong</i> Power Information System, China
13:45~14:00	146	A Very Short-term Forecasting Approach for Virtual Power Plant Using a Self-adaptive Hybrid Algorithm <i>Yu Zhu, Zhongkai Yi, Qiuyu Lu, Yinguo Yang, Bo Li, Yingming Lin, Yan Tan, Kang Wang and Yinliang Xu</i> Tsinghua University, China
14:00~14:15	148	Intelligent Flexible Priority List for Reconfiguration of Microgrid Demands Using Deep Neural Network <i>Ahmed Alahmed, Salman Taiwo, Mohamed Abido and Mohammed Almuahini</i> King Fahd University of Petroleum and Minerals, Saudi Arabia
14:15~14:30	176	The applications of XGBoost in Fault Diagnosis of Power Networks <i>Bo Wang, Ke Yang and Shaozhen Chen</i> State Grid E-Commerce Co., LTD, China
14:30~14:45	198	Multi-angle analysis and calculation of electric heat storage heating equipment connected to distribution network <i>Peixian Cong, Weichun Ge, Fujia Zhang, Yueyue Li and Changlong Yang</i> Northeastern University, China
14:45~15:00	341	Study on the Index System of Windproof Safety Evaluation for Coastal Power Grids <i>Yun Qin, Xianfu Gong, Yang Fan, Hao Yu, Xin Cheng and Yao Duan</i> China Southern Power Grid, China
15:00~15:15	355	A Simplified Model Prediction Control Method for PV Grid-Connected Inverter <i>Zhenao Sun, Wei Zheng and Heng Du</i> Northeastern University, China

SS18- Stochastic and Robust Optimization for Power System with High-Level Uncertain Renewable Energy Resources

Session Chairs: Yan Xu, Nanyang Technological University

Tao Ding, Xi'an Jiaotong University

Venue: Brocade City Hall-3 (锦城 3 厅)

Time	Paper ID	Title & Authors
13:30~13:45	213	A Two-Stage Stochastic Operation Approach of Combined Heat and Power Networks <i>Yumin Chen, Yan Xu, Zhengmao Li, Hongming Yang, Luiz Carlos Pereira Da Silva and Ashu Verma</i> Nanyang Technological University, Singapore

13:45~14:00	353	Stochastic Optimal Power Flow for Islanded Microgrids Considering Droop Control <i>Daichen Liu, Cuo Zhang and Zhao Yang Dong</i> UNSW, Australia
14:00~14:15	356	Extracting Time-Varying Subsynchronous Oscillation in Wind Power Systems Through Kalman Filtering <i>Jan Shair, Chen Wu, Wei Huang and Xiaorong Xie</i> Tsinghua University, China
14:15~14:30	414	Dynamic Reactive Power Robust Allocation Based on Linear Power Flow for Large-Scale Wind Farm Integration <i>Mang Jiang, Chi Xu, Qinglai Guo, Wei Wang, Huaichang Ge and Bin Wang</i> Tsinghua University, China
14:30~14:45	431	An Improved Scenario Reduction Technique and Its Application in Dynamic Economic Dispatch Incorporating Wind Power <i>Yating Zhou, Libao Shi and Yixin Ni</i> Tsinghua University, China
14:45~15:00	475	The Impact of Grid Uncertainties on Optimal Transmission Switching <i>Tian Lan, Garng Huang and Zhangxin Zhou</i> Texas A& M University, College Station, United States
15:00~15:15	624	Multi-Period Stochastic Economic Dispatch of Microgrid Considering Renewable Energy Uncertainty Using Parallel Algorithm <i>Bo Feng, Hongyu Yang, Qingrun Yang, Tao Ding and Haixiang Zang</i> Xi'an Jiaotong University, China
15:15~15:30	928	Probabilistic Transmission Network Expansion Planning Considering Integration of Wind Power <i>Heng Zhang, Shenxi Zhang, Haozhong Cheng, Zheng Wang and Jianping Zhang</i> Shanghai Jiao Tong University, China

Special Sessions

16:00-18:00 | FRIDAY, MAY 24

SS19-Planning, Operation and Control of Large-Scale Electrical Vehicle for its Integration with Power Systems and Transportation Systems

Session Chairs: Yingyun Sun, North China Electric Power University

Wei Wei, Tsinghua University

Junjie Hu, North China Electric Power University

Venue: Chamber of Blossom (梅兰阁)

Time	Paper ID	Title & Authors
16:00~16:15	145	Spatial-temporal Charging Pattern Analysis for Electric Taxi Grid Integration Study <i>Haidong Yu and Aiqiang Pan</i> Shanghai Jiao Tong University, China

16:15~16:30	289	Operation of an ICE/PM/TTRB APU in a Range Extender Electric Vehicle Power-Train <i>Yongpeng Shen, Gaorui Ge, Ankang Liu and Zhufeng Zheng</i> Zhengzhou University of Light Industry, China
16:30~16:45	303	Coordinated Control Strategy of Electric Vehicles and Energy Storage System for Smoothing Power Fluctuations of Photovoltaics <i>Huayanran Zhou, Yang Li and Junjie Hu</i> North China Electric Power University, China
16:45~17:00	309	Analysis of charging demand of household electric vehicles based on travel characteristics <i>Xingang Yang, Yahui Cai, Meixia Zhang and Xiu Yang</i> Shanghai University of Electric Power, China
17:00~17:15	354	Optimal Charging Strategy of an Electric Vehicle Aggregator in Ancillary Service Market <i>Zhouyang Wu, Junjie Hu, Jiechen Wu and Xin Ai</i> North China Electric Power University, China
17:15~17:30	367	A Locating Method of EV Fast Charging Stations Based on the Conditional Generative Adversarial Networks <i>Chunfei Wang, Yingyun Sun and Lei Dong</i> North China Electric Power University, China
17:30~17:45	384	Wind Power Fluctuation Absorption through EV Charging Power Control Based on Markov Chain <i>Xin Pei, Chunlin Guo, Xiangzheng Song, Chun Li and Kai Ma</i> North China Electric Power University, China

SS20-Planning and Operation of Smart Distribution Network with High Penetration of Distributed Energy Resources and Electric Vehicles-II

Session Chairs: Shenxi Zhang, Shanghai Jiao Tong University

Yue Xiang, Sichuan University

Venue: Brocade City Hall-1,2 (錦城 1、2 厅)

Time	Paper ID	Title & Authors
16:00~16:15	764	A Novel Voltage Regulation Strategy for Secure Operation of High Renewable Penetrated Distribution Networks with Different R/X and Topologies <i>Qian Hu, Siqi Bu, Shiwei Xia and Hui Cai</i> The Hong Kong Polytechnic University, China
16:15~16:30	777	Predictive Control of Regional Flexible Load Cluster Based on Mixed Logical Dynamic Method <i>Guanhong Chen, Dong Liu and Lixia Yan</i> Shanghai Jiao Tong University, China
16:30~16:45	793	Fuzzy Logic-Based Electric Vehicle Charging Management Considering Charging Urgency <i>Lidan Chen and Bo Chen</i> Michigan Technology University, USA

16:45~17:00	960	Long-Term Electric Vehicle Planning in a Microgrid <i>Jean-Michel Clairand, Mariano Arriaga, Mohammad Hasan Ravanji and Guillermo Escrivá-Escrivá</i> Universidad de las Américas - Ecuador, Ecuador
17:00~17:15	982	Correlation-based Investment Decision-Making for Distribution Network Reconstruction <i>Yue Xiang, Junyong Liu, Yanxin Chai, Lili Zhou and Shuai Hu</i> Sichuan University, China

SS21-Artificial Intelligence for Smart Grid and Sustainable Energy Systems - II

Session Chairs: Bowen Zhou, Northeastern University

Zhile Yang, Chinese Academy of Sciences

Siqi Bu, Hong Kong Polytechnic University

Mingjian Cui, Southern Methodist University

Venue: Elegance and Auspice Room (雅瑞厅)

Time	Paper ID	Title & Authors
16:00~16:15	401	A novel LSTM based deep learning approach for multi-time scale electric vehicles charging load prediction} <i>Juncheng Zhu, Zhile Yang, Yan Chang, Yuanjun Guo, Kevin Zhu and Jianhua Zhang</i> Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China
16:15~16:30	528	A short-term integrated forecasting model for the active power of photovoltaic generation based on support vector machine algorithm <i>Tianqi Lu, Xiao Pan, Yanlu Xu, Siqi Cheng, Jiahuan Li, Zhuoran Song, Hua Li and Peng Yu</i> State Grid Liaoning Electric Power CO,LTD. Power Economic Research Institute, China
16:30~16:45	568	Weight Acceleration Based Neural Network Design Method For Energy System State Analysis <i>Yongheng Pang, Dongsheng Yang, Mingjia Ji and Yueyue Li</i> Northeastern University, China
16:45~17:00	614	Intelligent Fault Diagnosis of Three-Trans Towers' Bolts Based on EMD and LS-SVM <i>Xian Wu, Yuan Cai, Ruidong Shi, Yu Wang, Yue Zuo and Xuefang Liu</i> Northeastern University, China
17:00~17:15	622	Pre-Day Coordinated Optimal Control of Large-Scale Electro-thermal Internet Based on The Response of Heating Temperature Demand of Thermal Users <i>Ping Li, Weichun Ge, Siluo Sun, Aimin Li and Jiajue Li</i> Northeastern University, China
17:15~17:30	686	Dispatching Strategy of Combined Heat and Power System Based on Additional Heat Source for Wind Power Accommodation <i>Weichun Ge, Tao Wang, Jing Gao, Yihe Wang, Yanfeng Ge, Kang Liu and Bonan Huang</i> Northeastern University, China
17:30~17:45	745	Research on Wind Power Prediction Method Based on Convolutional Neural Network and Genetic Algorithm <i>Gang Chen, Zhenyu Li, Dan Yang Li, Jingning Shan, Dong Zhao, Zhicheng Gao, Chengwei Li, Chenqi Wang and Ji Jun Hao</i> Northeast University, China

Special Events

Mini-Symposium 1	Venue: Four Seasons Hall-1, 2(四季 1、2 厅)
May 22, 2019 13: 30-15:30	Mini-Symposium on key technologies and applications of cyber energy systems oriented to new-type urbans Organizers: <i>Yanli Liu</i> , Tianjin University, China <i>Can Wan</i> , Zhejiang University, China
Mini-Symposium 2	Venue: Brocade City Hall-1, 2(锦城 1、2 厅)
May 23, 2019 16: 00-18:00	Mini-Symposium on Global Energy Interconnection Development and Talent Cultivation Organizers: <i>Ming Yang</i> , Shandong University / Strategy and Technology Research Institute of Global Energy Interconnection, China <i>Yanqiu Bi</i> , University Alliance Secretariat of Global Energy Interconnection, China
Panel 1	Venue: Venue: Chegdu Hall-A(成都 A 厅)
May 22, 2019 13: 30-18:00	Resilience of Power Systems and Energy Internet Organizer: <i>Yin Xu</i> , Beijing Jiaotong University, China
Panel 2	Venue: Chegdu Hall-B(成都 B 厅)
May 22, 2019 16: 00-18:00	Distributed Energy Resources, What Can Be Learned from Experience of Australia and China Organizer: <i>Dean Sharafi</i> , Group Manager, System Management – Australian Energy Market Operator, Australia
Panel 3	Venue: Four Seasons Hall-3, 4(四季 3、4 厅)
May 23, 2019 13: 30-15:30	Multi-timescale Transient Stability in Power-Electronized Power Systems Chair: <i>Hu Jiabing</i> , State Key Laboratory of Advanced Electromagnetic Engineering and Technology, Huazhong University of Science and Technology, China
Women in PES	Venue: Four Seasons Hall-3, 4(四季 3、4 厅)
May 23, 2019 16:00~18:00	Career Advancement, Networking and Education of Women in the Energy Industry Session Chair: <i>Xiaoru Wang</i> , Southwest Jiaotong University, China

Time	Activity of WiP	Presenter
16:00~16:25	Opening Speech	<i>Xiaoru Wang</i>
16:25~16:30	Invited Opening Remarks	<i>Saifur Rahma</i>
Invited Speeches		
16:30~16:45	How to get connected with industry as students?	<i>Yilu Liu</i>
16:45~17:00	What women can achieve through the participation of international organizations	<i>Ruomei Li</i>
17:00~17:15	Research and practice of power system control	<i>Xiaoyan Pang</i>
17:15~17:30	Establishment of IEEE task force and panel session	<i>Juan Yu</i>
17:30~17:45	Early Career Researchers to Succeed in Universities	<i>Feifei Bai</i>
17:45~18:00	Social Networking	

Technical tour

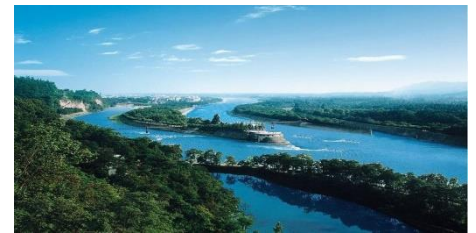
May 24, 2019

13:30	Pick up at Jinjiang Hotel (Lobby at East Wing)	
14:00~14:30	Visit State Grid Sichuan Electric Power Company A wholly-owned subsidiary of State Grid Corporation in Sichuan.	
15:00~15:30	Visit Chengdian Dawei Technology Co. Ltd. A leading technology, system and service provider in the field of Electric Energy & Electronic Information supported by UESTC.	

City tour in Chengdu

May 25, 2019

- 07:20** Pick up at Jinjiang Hotel (Lobby at East Wing)
- 08:00** **Chengdu Giant Panda Base**
成都大熊猫繁育研究基地
The Base, as the “giant panda ex situ conservation ecological demonstration project”, is famous for the protection and breeding of endangered wild animals that are unique to China, including giant pandas and red pandas.
- 11:50** **Lunch** at Sichuan Impression Restaurant
- 14:00** **Dujiangyan Scenic Area, Erwang Temple, Anzhen Cable Bridge, Lidun Park, Yuleishan Park, Yuge Pavilion**
都江堰景区
The Dujiangyan is an ancient irrigation system in Dujiangyan City, Sichuan, China. Originally constructed around 256 BC by the State of Qin as an irrigation and flood control project, it is still in use today.
- 17:00** **Qintai Road/ Kuanzhai Alley**
琴台故径/宽窄巷子
Kuanzhai Alley consists of Kuan Lane, Zhai Lane and Jing Lane, which are in parallel arrays running from east to west with a group of quadrangles. It is one of major historical and cultural conservation areas in Chengdu.



Note: The entrance fees and basic transportation fee are included. But the transportation fee in the scenic spot is excluded, such as the sightseeing car.

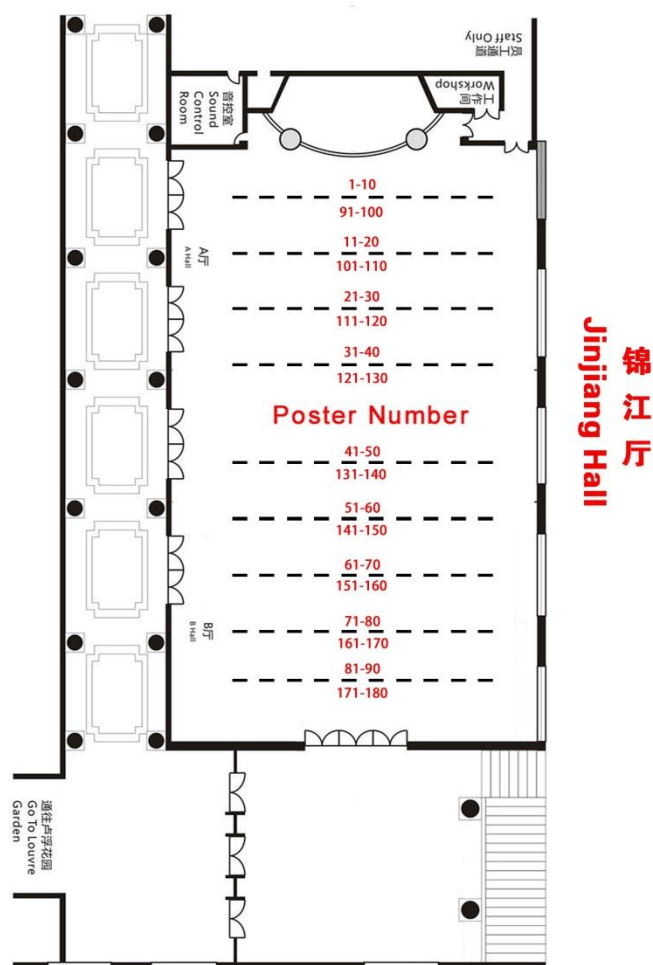
SPECIAL EVENTS

Instruction for Presentation

Oral Presentation

- The duration of a presentation slot is 15 minutes. Please target your lecture for a duration of about 12 minutes for the presentation plus ab. 3 minutes for questions from the audience.
- Presentations **MUST** be uploaded at the speakers' room at least 20 minutes before the session starts.
- Please bring a paper printed with your short bio (200 words at most) to the conference and then give it to the session chair prior to your presentation.

Poster Presentation



- The size of poster board is 90cm wide * 140cm high. Posters must be in portrait format (height > width).
- Boards will be labelled with the "Board Number". Please refer to the conference program to find the corresponding board to fit your posters.
- At least one author stands by the poster for (most of the time of) the duration of the poster session. This is essential both to present your work to anyone interest into it and to make sure that your presence is verified by one of the session chairs.
- Materials to hang the poster will be made available on-site. Our staff will be available onsite to assist you to put up the posters at least **15 minutes** prior to the commencement of each poster session.

Please remove your poster at the end of the session. Left behind posters at the end of the session will be disposed of.

Conference Site



Jinjiang Hotel

Address: No.80, Section 2, Renmin RD. S. Chengdu, China

E-mail: reservation@jjhotel.com

Tel: (+86-28)8550-6666



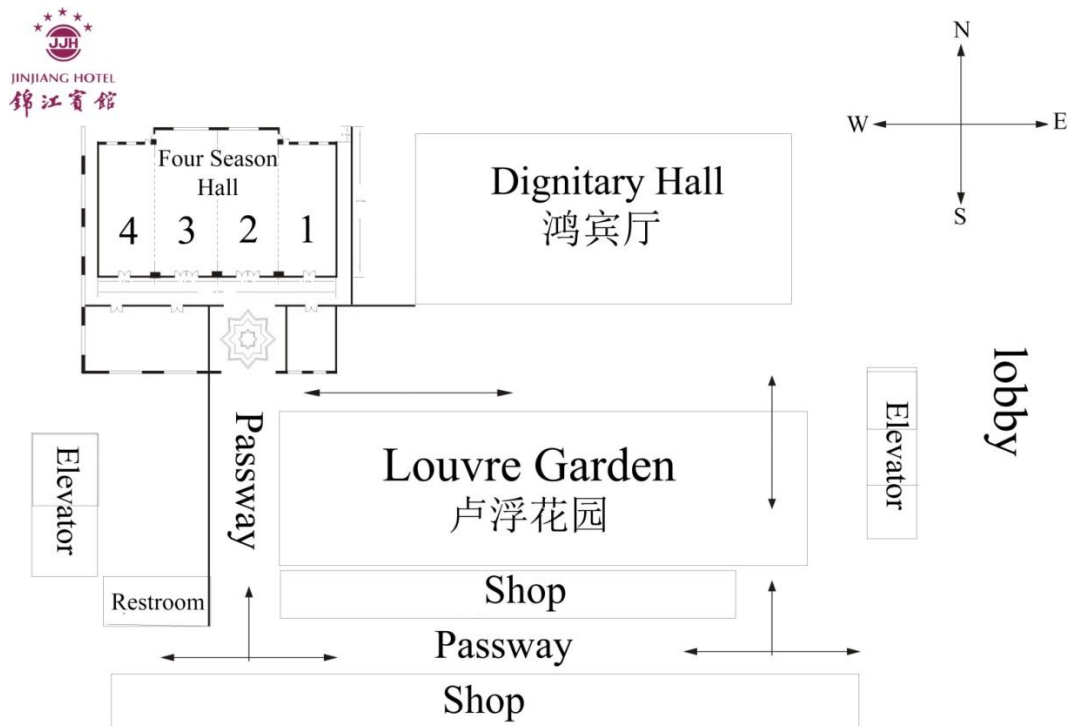
Floor Plan

1st Floor:

Dignitary Hall(鸿宾厅)

Louvre Garden(卢浮花园)

Four Seasons Hall(四季厅)



VENUE FLOOR PLAN

2nd Floor:

Chamber of Mist (馨雨阁)

Chamber of Peony (牡丹亭)

Elegance and Auspice Room (雅瑞厅)

Chamber of Dew (浣花轩)

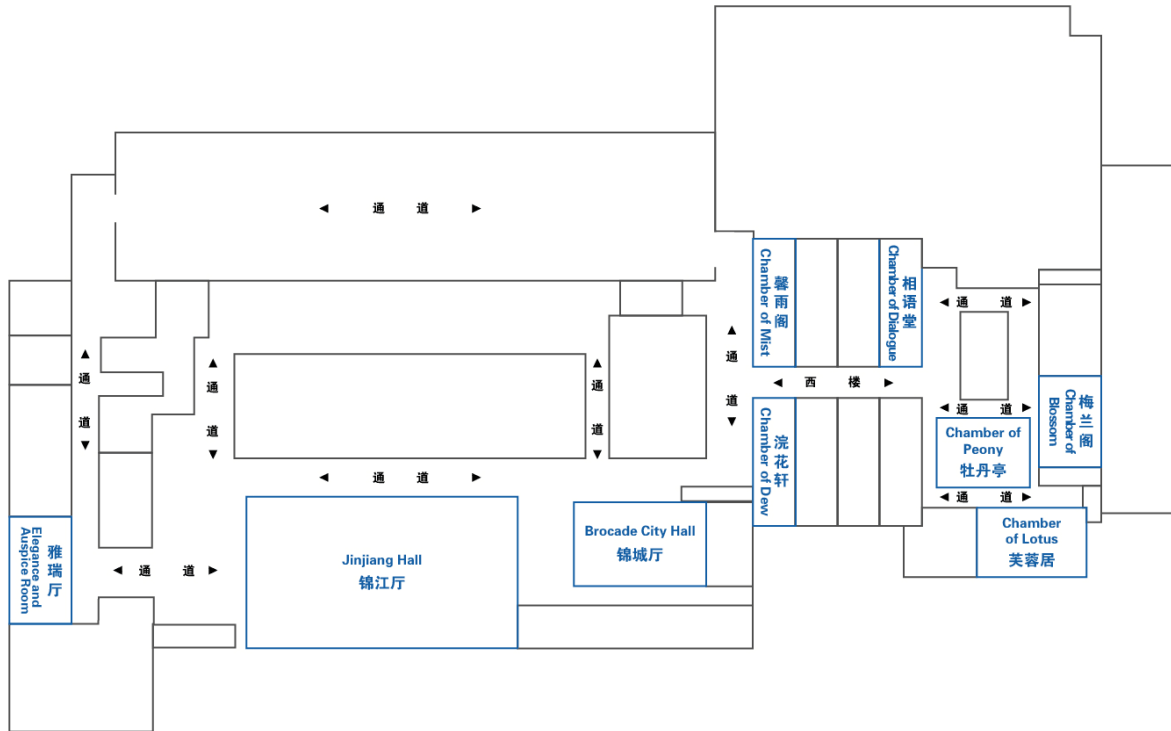
Chamber of Blossom (梅兰阁)

Brocade City Hall (锦城厅)

Chamber of Dialogue (相语堂)

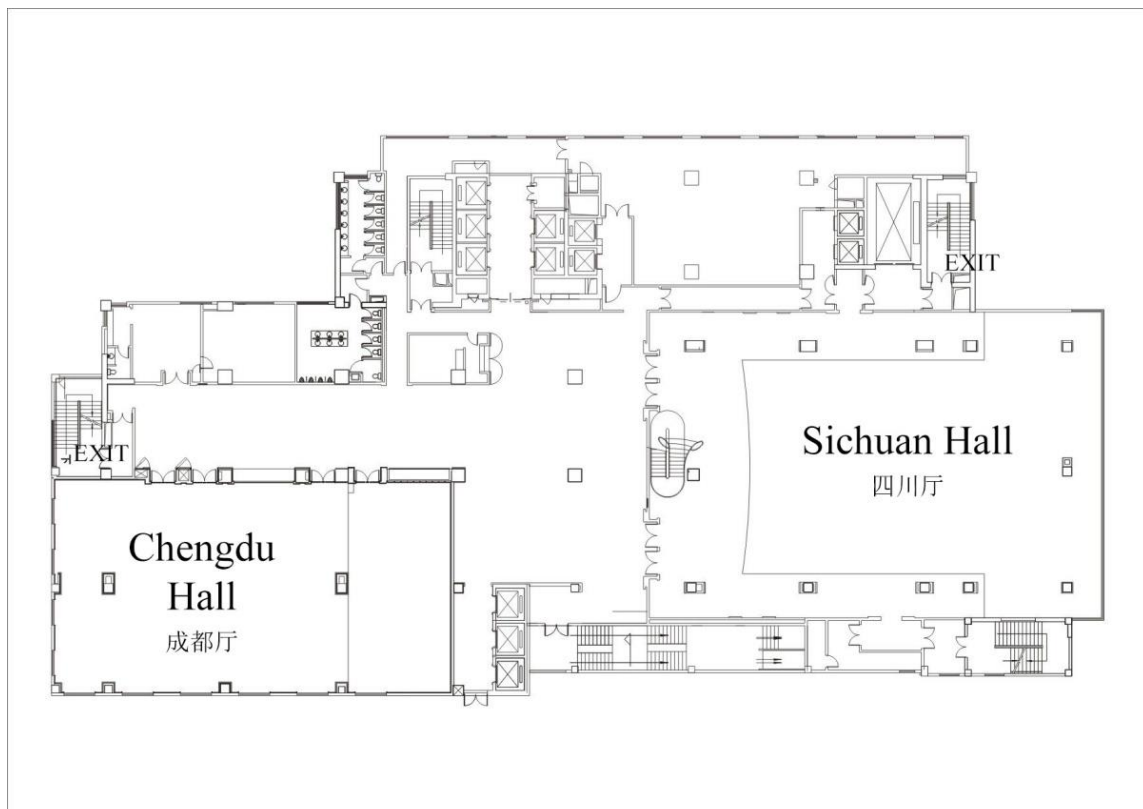
Chamber of Lotus (芙蓉居)

Jinjiang Hall (锦江厅)



3rd Floor:

Chengdu Hall(成都厅)



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Kang Ju	45	TS06	12	Liu Wei	671	SS06	54
Kangli Xiang	110	PS III	60	Liu Ya	779	SS13	99
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Ke Zuo	975	TS41	91	Longxian Hu	177	TS03	10
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Yang Liu	684	TS26	80	Yonghui Sun	325	PS IV	64
Yang Wang	245	PS II	34	Yonghui Sun	328	PS I	24
Yang Wang	252	PS IV	72	Yongjie Zhong	250	PS I	26
Yang Wang	664	PS I	27	Yongli Zhu	509	TS33	85
Yang Zhang	789	PS III	63	Yongli Zhu	808	TS22	78
Yangjingjing	416	TS29	82	Yongli Zhu	985	TS44	94
Yanhong Yang	543	PS IV	73	Yongli Zhu	988	PS I	28
Yanjun Ma	422	TS25	79	Yongmei Jiang	720	PS I	28
Yannan Dong	874	PS II	36	Yongsheng Jin	122	SS02	19
Yanping Wang	762	PS IV	73	Yongsheng Jin	323	PS III	59
Yanxin Chai	296	PS II	35	Yongxi Huang	304	SS05	53
Yanxin Chai	297	PS II	35	Yongyuan He	669	PS I	25

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Yu Chen	798	SS07	55	Zhang Xi	811	TS31	84
Yu Fang	288	TS15	48	Zhang Zhixia	903	PS III	61
Yu Xiuyong	435	TS23	78	Zhang Zhixia	917	PS IV	66
Yuan Li	879	SS11	97	Zhangfujia	198	SS17	102
Yuan Li	900	SS08	56	Zhangquan	754	TS37	88
Yuan Yan	522	SS12	98	Zhao Min	129	TS04	11
Yuanji Cai	647	PS III	58	Zhao Yunhao	727	SS13	99
Yuanlin Pan	937	TS41	91	Zhao Zhen	456	TS33	85
Yuanxiang Wang	625	SS15	100	Zhaoyun Zhang	179	TS05	12
Yuchen Qi	451	SS05	53	Zhaoyun Zhang	277	PS IV	69
Yue Li	990	TS45	94	Zhaoyun Zhang	282	PS II	30
Yuehui Huang	239	SS08	55	Zhe Wang	845	PS IV	70
Yueping Xiang	380	PS II	36	Zhe Yang	281	TS11	16
Yufei Song	434	SS02	19	Zhen Ao Sun	355	SS17	102
Yufei Xi	938	SS14	99	Zhen Chen	103	PS IV	68
Yufeng Chai	160	TS03	10	Zhendong Tan	677	SS07	55
Yuhang Luo	656	SS09	96	Zheng Quanchao	143	PS IV	68
Yuhua Lv	673	PS III	63	Zheng Yuqi	315	TS11	16
Yujia Li	471	TS20	52	Zhengbo Chen	875	SS03	20
Yulong Che	363	SS06	54	Zheng-Gui Li	886	SS03	20
Yulu Zhou	400	PS II	30	Zheng-Gui Li	911	SS03	20
Yumeng Liu	502	PS III	58	Zhenhuan Ding	797	SS15	100
Yun Qin	341	SS17	102	Zhenyu Song	596	SS04	20
Yun Xue	993	PS III	62	Zhenyu Tang	863	PS IV	66
Yundai Xu	799	TS40	90	Zhenyuan Zhang	254	TS10	16
Yunjian Xu	815	PS III	59	Zhenyuan Zhang	999	SS03	20
Yunkai Lei	120	TS41	91	Zhenyuan Zhang	1013	PS I	26
Yunpeng He	834	PS IV	70	Zheqian Jin	189	PS II	29
Yuqian Li	710	PS IV	70	Zheqian Jin	314	PS I	24
Yuqiang Fan	833	TS35	86	Zheren Zhang	17	PS IV	67
Yushan Hou	459	TS24	79	Zhi Cai	418	TS23	78
Yutong Liu	553	PS IV	65	Zhi Cai	719	PS III	58
Yuxiong Liu	598	SS07	54	Zhibo Ma	701	PS I	27
Yuzhou Zhao	387	TS29	82	Zhichao Lin	59	PS IV	68
Yuzhou Zhao	945	TS45	94	Zhichun Yang	166	PS III	63
				Zhifang Yang	375	TS07	14
Z				Zhigang Xie	868	SS01	18
Zao Tang	105	SS16	101	Zhigang Ye	1003	PS II	33
Zbigniew Galias	792	TS08	14	Zhihui Dai	10	TS01	9
Zeng Tingting	492	PS I	26	Zhihui Dai	11	PS IV	67
Zeyang Tang	130	SS12	98	Zhihui Dai	742	TS37	88
Zeyang Tang	174	TS04	11	Zhiquan Zhang	58	TS03	10
Zhang Anan	350	TS07	14	Zhirui Liang	474	TS14	47
Zhang Huiquan	916	SS10	97	Zhirui Wang	943	TS45	94
Zhang Jiarui	901	TS43	93	Zhiyu Chen	934	TS28	82
Zhang Shifeng	140	PS III	60	Zhiyu Wei	33	PS III	59
Zhang Tianjiao	933	TS37	88	Zhiyuan Ma	154	PS IV	64

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Zhou Wenyue	115	PS I	26	Zonghang Han	715	TS18	51
Zhou Yuzhou	104	TS21	77	Zuoyun Tan	575	SS08	55
Zihan Lin	536	SS12	98				

