**Sunday, December 1**

**Sunday, December 1 15:00 - 17:30**

**T1_tutorial: Demand Response Fundamentals, Applications and Recent Development**

Haiwang Zhong, Associate Professor, Tsinghua University; Jianxiao Wang, Assistant Professor, North China Electric Power University  
Room: N1-1005

**T2_tutorial: Power Quality Issues, Impacts and Their Mitigation Techniques**

Chi-Seng Lam, Associate Professor, University of Macau  
Room: N1-1005

**T3_tutorial: Steady-State and Transient Analysis of Asymmetrical Three-Phase Electrical Systems**

DIEGO BELLAN, Department of Electronics, Information and Bioengineering, Politecnico di Milano  
Room: N1-1004
Monday, December 2

Monday, December 2 9:30 - 12:40

Room: room_7401-7503

K1: Keynote Speech: Distribution Automation - Past, Present and Future

Frank C. Lambert, P. E., Principal Research Engineer Georgia Tech's Center for Distributed Energy (CDE) and National Electric Energy Testing Research and Applications Center (NEETRAC)

K2: Keynote Speech: Smart Grid Solution to Harmonize Fluctuating Renewable Energy and Flexible Demand Resources

Prof. Yonghua Song, Rector of University of Macau


Tony Wood, Program Director of Clean Energy Projects at the Clinton Foundation, Grattan Institute's Energy Program, Australia

K4: Keynote Speech: Smart Grids Smart Cities

Felix Wu, Professor Emeritus University of California, Berkeley (UCB) and the University of Hong Kong (HKU)

Monday, December 2 14:00 - 15:30

D1_TS01: Power System Analysis_1

Room: room_7301A

14:00 Extended Affine Arithmetic Based Quantitative Analysis of DG's Uncertainty on Distribution System
Dinglin Li and Man Chen (CSG Power Generation Company, P.R. China); Peng Peng (China Southern Power Grid Company Limited, P.R. China); Xiaobing Liao, Kaipei Liu and Liang Qin (Wuhan University, P.R. China)

14:15 Frequency Vulnerability Analysis of Power Systems Considering UAV Striking
Wenjun Bi, Kaifeng Zhang, Ying Wang and Zhetong Ding (Southeast University, P.R. China)

14:30 Active Power Transfer of Power Systems Considering Top-Oil Temperature Limit of Transformers Based on Two-Layer Optimization
Chao Lei (StateGrid, P.R. China); Qianggang Wang (Chongqing University, P.R. China); Jing Li (Lingnan University in Hong Kong, P.R. China)

14:45 Calculation of Series Resonance Frequencies in Electrical Grids Using Resonance Mode Analysis
Alexander Neufeld and Daniel Heide (Leibniz University Hannover, Germany); Lutz Hofmann (Leibniz Universität Hannover, Germany)
15:00 Adaption of the Current Load Model to Consider Residential Customers Having Turned to LED Lighting
Daniel-Leon Schultis and Albana Illo (TU Wien, Austria)

15:15 Reliability Evaluation of Distribution Network Containing PV-assisted Charging Station for EVs
Jingjie Wang, Hongbin Wu and Shiwei Li (Hefei University of Technology, P.R. China); Shihai Yang (State Grid Jiangsu Electric Power Company, P.R. China)

D1_TS02: Electric and Hybrid Vehicles_1

Room: room_7301B

14:00 A Integrated Conversion System and Charge Balance Control Strategy for PHEV Based on MMMC
Zhenxing Cheng (Shandong University Qianfoshan Campus, P.R. China); Guangzhu Wang (Shandong University, P.R. China)

14:15 Transactive Energy Based Approach for Large-Scale Plug-in Electric Vehicle Charging Control
Zhouquan Wu, Chong Cao and Bo Chen (Michigan Technological University, USA)

14:30 Design and Parametric Analysis of a Long Stroke Magnetic-gear Linear Machine with Low Material Costs
Xiongsong Li and Xiao Liu (Hunan University, P.R. China); Yutong Wang (Hunan University, P.R. China); Yuxing Liu (Hunan University, P.R. China)

14:45 Economic Operation for Microgrid Based on Interval Planning Method with Consideration of Electric Vehicle
Xu Wang and Jian Chen (Shandong University, P.R. China); Guanyu Song (Tianjin University, P.R. China); Yicheng Zhang (School of Electrical and Electronic Engineering Nanyang Technological University & Rolls-Royce @ NTU Corp Lab, Singapore)

15:00 Self-Contained Solar-Powered Inductive Power Transfer System for Wireless Electric Vehicle Charging
Zhicong Huang (University of Macau, Macao); Io Wa Iam (University of Macau, Macau, Macao); Iok U Hoi, Chi-Seng Lam, Pui-In Mak and Rui P. Martins (University of Macau, Macao)

D1_TS03: Power and Energy Engineering Planning, Management and Control_1

Room: room_7504

14:00 An Iterative Approach to FACTS Set Point Optimization in Day-Ahead Generation Scheduling
Kwok W. Cheung (GE, USA); Jun Wu (GE Grid Solutions, USA)

14:15 The Assessment of a Micro-Grid Operation Under Optimal Planning of Electric Energy Storage Units RSE’s Case Study
Yelena Vardanyan (Technical University of Denmark, Denmark); Maurizio Verga (Ricerca sul Sistema Energetico - RSE SpA, Italy); Riccardo Lazzari (Ricerca sul Sistema Energetico, Italy); Marcel K. Pendieu (Ricerca sul Sistema Energetico - RSE SpA, Italy); Henrik Madsen (Technical University of Denmark, Denmark & NTNU, Norway)

14:30 Energy Management for a Microgrid with Different Charging and Discharging Priorities of Batteries Using Modified Grey Wolf Optimizer
Yuhao Cao and Tengpeng Chen (Xiamen University, P.R. China); Lu Sun (Experimental Power Grid Centre (EPGC), A*STAR, Singapore); Xinlin Qing and Jingrui Zhang (Xiamen University, P.R. China)

14:45 A Regional Integrated Energy System Dispatching Method Considering Energy Cascade Utilization
Xu Zhu, Jun Yang and Fuzhang Wu (Wuhan University, P.R. China); Xueli Pan (Wuhan Power Supply Company, P.R. China)

15:00 Decentralized Expansion of Transmission Networks Incorporating Active Distribution Networks
Jia Liu (Hangzhou Dianzi University & Energy Development Research Institute, China Southern Power Grid, P.R. China); Pingliang Zeng (Hangzhou Dianzi University, P.R. China); Shenxi Zhang and Haozhong Cheng (Shanghai Jiao Tong University, P.R. China); Jianping Zhang and Xiaohu Zhang (East China Grid Corporation, P.R. China)

D1_TS04: Power Transmission and Distribution_1

Room: room_7405

14:00 Implementation of a Future Nine-Phase Power Transmission Line
Patrick Serge Pouabe Eboule and Jan Harm Pretorius (University of Johannesburg, South Africa); Nhlanhla Mbuli (University of Johannesburg & Eskom Holdings SoC Limited, South Africa)

14:15 The Potential Impact of Flexible DC Transmission and Distribution on Insulated Cables: Accelerated Aging and Premature Failure
Gian Carlo Montanari (CAPS, Florida State University, USA)

14:30 Infrared Image Recognition Method of High Voltage Porcelain Insulator Based on Self-Constructed CNN
Yipeng Lu, Jungang Yin and Jiaangang Yao (Hunan University, P.R. China); Xueming Zhou and Danhui Hu (State Grid Hubei Electric Power Research Institute, P.R. China)

14:45 Topology and Operation Principle of Cross-connected Sub-modules for Bulk Power Overhead Line Transmission
Gaoren Liu (TEPDI, P.R. China); Yuzhe Xu and Facai Xing (Zhejiang University, P.R. China)

15:00 Extinguishment Distance Estimation Method of DC Breaking Arc Occurring Under Low Voltage DC Conditions
Yong-Jung Kim (Kongju National University, Korea); Woo-Yong Jeong (Dev. of EE & Control Eng., Kongju National University, Korea); Hyosung Kim (Kongju Nat'l Univeristy, Korea)

15:15 Reliability Assessment of Medium Voltage Underground Cable Network Using a Failure Prediction Method
Jan Harm Pretorius, Pierre van Rhyn and Nqaba Mehlo (University of Johannesburg, South Africa)

D1_TS05: Renewable & Sustainable Energy_1

Room: room_7404

14:00 Sub- And Super-Synchronous Oscillation Analysis of Hami Renewable Energy Bases in Xinjiang Power Grid
Yu Li (State Grid Xinjiang Electric Power Co., Ltd, P.R. China); Facai Xing (Zhejiang University, P.R. China); Yiqian Sun and Heng Wang (State Grid Xinjiang Electric Power Co., Ltd, P.R. China); Zheng Xu (Zhejiang University, P.R. China)

14:15 Deep Learning Based Model for Defect Detection of Mono-Crystalline-Si Solar PV Module Cells in Electroluminescence Images Using Data Augmentation
Wuqin Tang (Zhejiang University, P.R. China); Qiang Yang (Zhejiang University & College of Electrical Engineering, P.R. China); Wenjun Yan (Zhejiang University, P.R. China)

14:30 Photovoltaic Power Generation Prediction Using Data Clustering and Parameter Optimization
Feng Zhu (Zhejiang University, P.R. China); Qiang Yang (Zhejiang University & College of Electrical Engineering, P.R. China); Wenjun Yan (Zhejiang University, P.R. China)

14:45 Influence of Parameters Non-uniformity on Inverters Dynamic Equivalent Error
Man Chen and Dinglin Li (CSG Power Generation Company, P.R. China); Zhu Shu (WuHan University, P.R. China); Xing Feng (Harbin Engineering University, P.R. China); Kaipei Liu (Wuhan University, P.R. China)

15:00 Integration of Intermittent Renewable Energy Sources in an Active Distribution Network
Haijun Xing (Shanghai University of Electric Power, P.R. China); Hequan Ren and Yuqing Hu (State Grid Shaoxing Power Supply Company, P.R. China)

15:15 Wind Power Integration Capability Evaluation of Large-scale Combined Heat and Power System with Additional Heat Source
Zhenyi Wang (Yunnan Power Grid Company Lmt., P.R. China); Zhongkai Yi and Jianuo Zhou (Tsinghua University, P.R. China); Ronghua Duan (Yunnan Power Grid Company Lmt., P.R. China); Tao Zhu (Kunming Electric Power Supply Bureau, P.R. China); Tian Xia and Yinliang Xu (Tsinghua University, P.R. China)

D1_TS06: Power Quality, Protection and Electromagnetic Compatibility_1

Room: room_7505

14:00 A State Assessment Method of Relay Protection Device Based on PSO Optimizes SVM Parameters and Could Model
Haitao Chen and Jun Yang (Wuhan University, P.R. China); Xueli Pan (Wuhan Power Supply Company, P.R. China)

14:15 Symmetrical-Component Approach for Circuit Modeling of EMI Emissions in Three-Phase Inverters
Diego Bellan (Politecnico di Milano, Italy)

14:30 On-line Diagnosis and Location of High Voltage Cable Sheath Fault Based on Sheath Current
Wen He (Administration of Power Supply of Dongguan, P.R. China); Ting Yang, Haohui He and Junxuan Hong (Guangdong Dongguan Power Supply Bureau Power Grid Co. Ltd., P.R. China); Bo Wei (City Cloud Technology (China) Co., Ltd., P.R. China)

14:45 Power Quality Evaluation Based on Combinatorial Weighting Method & TOPSIS
Chao Ma (Shandong University, P.R. China)

15:00 Research on Calibration Technology of Arresters Monitoring Device
Jiliang Fu and Wei Zhou (China Electric Power Research Institute, P.R. China); Hua Wu (State Grid Chongqing Electric Power Research Institute, P.R. China); Cong Qi (China Electric Power Research Institute, P.R. China); Xin
15:15 **High Reliability Dynamic Voltage Restorer Based on Multi-winding Transformer**  
Longfu Luo, Weipeng Zhuang, Chen Li and Yimeng Zhang (Hunan University, P.R. China)
16:00 **Improvement of Electromechanical Mode Identification from Ambient Data with Stochastic Subspace Method**

Kaibin Li and Chen Lei (Tsinghua University, P.R. China); Zhe Yu, Yishen Wang and Di Shi (GEIRI North America, USA)

16:15 **Robust Distributed Optimal Energy Management for Multi-Energy Networked Microgrids**

Wentao Liu and Li Li (Electric Power Dispatching Control Center of Guangdong Power Grid Co., Ltd., P.R. China); Jianqiao Zhou, Yinliang Xu and Zhongkai Yi (Tsinghua University, P.R. China)

16:30 **Universal Non-Intrusive Load Monitoring (UNILM) Using Filter Pipelines, Probabilistic Knapsack, and Labelled Partition Maps**

Alejandro Rodriguez-Silva and Stephen Makonin (Simon Fraser University, Canada)

16:45 **A New Self-Synchronized Strategy for Grid-Connected Three Phase Voltage Source Inverters**

Mohamed Aboushal (Middle East Oil Refinery, Egypt); Mohamed M. Zakaria Moustafa (Alexandria University, Egypt); Mahmoud El-Gamal (Pharos University, Egypt)

17:00 **Non-Intrusive Load Disaggregation Considering User Behavior and Appliances States Combination**

Renjian Wu (Chengmai Power Supply Bureau of Hainan Power Grid Co., Ltd., P.R. China); Xufeng Yan (Shanghai Jiao Tong University, P.R. China); Longqiong Huang (Chengmai Power Supply Bureau of Hainan Power Grid Co., Ltd., P.R. China)

17:15 **Decentralized Electricity Transaction Mechanism in Distribution Network Based on Blockchain Technology**

Shiyu Meng, Weiqing Sun, Dong Han and Chengzhenghao Zhang (University of Shanghai for Science and Technology, P.R. China)

**D1_TS09: Renewable & Sustainable Energy_2**

Room: room_7405

16:00 **Optimal Operation of Concentrating Solar Power Station in Power System with High Penetration of Photovoltaic Generation**

Ping Chang, Tang Yi, Yunkai Huang and Jianfeng Zhao (Southeast University, P.R. China); Chenlong Li and Chao Yuan (Jiangsu Frontier Electric Technology Co., Ltd, P.R. China)

16:15 **Optimum Connection Structure for PV Panel Considering Shadow Influence**

Woo-Yong Jeong (Dev. of EE & Control Eng., Kongju National University, Korea); Yong-Jung Kim (Kongju National University, Korea); Hyosung Kim (Kongju Nat'l Unibersity, Korea)

16:30 **Impact of Enhanced Synchronization Techniques of Wind Power Plants on the Short-Circuit Current**

Nils Schäkel and Alexander Neufeld (Leibniz University Hannover, Germany); Lutz Hofmann (Leibniz Universität Hannover, Germany)

16:45 **Research on Integrated Energy Service Evaluation System Based on Optimal Combination Weighting**

Long Yang (Hefei University of Technology, P.R. China); Xuli Wang and Bin Ye (State Grid Anhui Economic Research Institute, P.R. China); Hongbin Wu (Hefei University of Technology, P.R. China)
17:00 Broadband Impedance Modeling and Its Characteristic Analysis of Single-phase Grid-connected Inverter Considering Frequency Coupling
Zhiwei Xie and Yadong Chen (Hunan University, P.R. China); Wu Wenhua (Hunan Univ, P.R. China); Yuancan Xu, Shang Peng, Jinming Liu and Shixiang Cao (Hunan University, P.R. China)

17:15 Advanced SoC Estimation of Li-Ion Batteries Accelerated Through ANN with Adaptive Algorithm
Minella Bezha (Doshisha University, Japan); Naoto Nagaoka (Doshisha University, unknown)

D1_TS10: Power System Analysis_2
Room: room_7505

16:00 Analyzing Loop Flows, Reversals, and Congestion Using a New Fractal Approach
Suresh Varwandkar (VJTI Mumbai, India); Jeremy Lin (Transmission Analytics, USA)

16:15 LMI Criterion of Coupled Microgrids for System-Wide Stability
Zuowei Ping and Wei Zhou (Huazhong University of Science and Technology, P.R. China)

16:30 Fast Assessment of Short-Term Voltage Stability of AC/DC Power Grid Based on CNN
Weiquan Yang, Yuanzhen Zhu and Yutian Liu (Shandong University, P.R. China)

16:45 An Interval Power Flow in AC/DC Hybrid System with Uncertainty
Shipeng Leng, Xiaohong Ran, Kaipei Liu, Shuyao Chen and Xunyue Zhang (Wuhan University, P.R. China)

17:00 Herding Behavior of Electricity Retailers in the Monthly Electricity Market: Model and Simulation
Yue Yao (Southeast University, P.R. China)

17:15 Assessment of Requirements for Application of Generator Circuit-Breakers in Synchronous Compensator Plants
Priyanka Gugale and Mirko Palazzo (ABB Switzerland Ltd., Switzerland)

D1_TS11: Special Session 01: New Challenges and Solutions for assessing the Impacts of Short/Mid-/Long-term Uncertainty in Planning and Operation of Deepening Renewable Energy Penetration Power Systems
Room: room_7301B

16:00 Optimal Placement of Energy Storage with Synthetic Inertia Control on a Grid with High Penetration of Renewables Using Mean-Variance Mapping Optimization
Israjuddin Israjuddin (PT PLN (Persero), Indonesia); Nanang Hariyanto (STEI ITB, Indonesia); Chih-Wen Liu and Chao-Yuan Lai (National Taiwan University, Taiwan)

16:15 Impact of Dynamic Operation on Reliability of an Aggregate Battery Energy Storage System
Trang Thi Pham and Kuo Tsai (Chung Yuan Christian University, Taiwan); Duong Minh Bui (Vietnamese-German University, Vietnam); Anh Pham (Chang Gung University, Taiwan)

16:30 Regional Grid Load Frequency Control Strategy Considering Renewable Energy
Wutao Chen, Dong Hua and Jiayu Zhong (South China University of Technology, P.R. China)

16:45 Electricity Market Simulation Considering High Proportion of Renewable Energy Penetration
Jiayu Zhong, Haoyong Chen and Wutao Chen (South China University of Technology, P.R. China)
Tuesday, December 3

Tuesday, December 3 9:00 - 11:00

Industrial Forum

Room: room_7401-7503

Host
Yonghua Song, Chair Professor, Director of State Key Laboratory of Internet of Things for Smart City and Rector of University of Macau, Macao, China

Discussion on Technological Advance at Macao Electric Power System
Benjamin Zongbin Yue, Principal Advisor of Executive Committee of CEM (Macau Electricity Company), Macao, China

Development of Guangdong-Hong Kong-Macao Greater Bay Area Underground Cable Networks and Its Smart Operation Systems
Mingli Fu, Electric Power Research Institute of China Southern Grid under the government's Global Experts Program, China

Internet + Energy - Practice and Discussion on Tencent Smart Energy
Yingya Crystal ZHOU, CEO, Smart Energy Business Center, Tencent Cloud, China

Tuesday, December 3 11:30 - 13:00

D2_Invited_02: Challenges and Solutions for Power Systems to Accommodate Road Transportation Electrification

Room: room_7404

Dr. Zechun Hu, Associate Professor of Tsinghua University, Beijing, China;
Dr. Hong-Tzer YANG, Professor and Chairman, Department of Electrical Engineering, National Cheng Kung University, Taiwan;
Dr. Jin ZHONG, Associate Professor of Hong Kong University, China;
Dr. Qian ZHANG, Associate Professor of University of Chongqing, Chongqing, China;
Dr. Guibin WANG, Associate Research Professor of Shenzhen University, Shenzhen, Guangdong, China; Dr. Hongcai Zhang, Assistant Professor of University of Macau, Macao, China;

D2_TS12: Renewable & Sustainable Energy_3

Room: room_7504

11:30 Modeling and Simulation Test for Voltage Multiplier and an LLC Resonant Inverter as a Voltage Equalizer
Xue Wang (XJTLU, P.R. China); Huiqing Wen (Xi’an Jiaotong-Liverpool University, P.R. China); Yinxiao Zhu (XJTLU, P.R. China)

11:45 Sizing and Siting of a Concentrating Solar Power Plant in an Unbalanced Radial Distribution System
Adriane Joshua J Miras (University of the Philippines Los Baños, Philippines); John Paul Pormanes Manzano (University of the Philippines, Philippines); Rodolfo Aguirre, Jr. (University of the Philippines Los Baños, Philippines); Kristel Mae V Aquino (University of the Philippines, Philippines)

12:00 A Simplified Wide-Bandwidth Generalized Impedance Model for Single-Phase Grid-Connected Inverter in Polar Coordinate System
Yuancan Xu and Yandong Chen (Hunan University, P.R. China); Wu Wenhua (Hunan Univ, P.R. China); Zhiwei Xie, Lu Xie, Jinming Liu and Shang Peng (Hunan University, P.R. China)

12:15 Control System Design of Variable Speed Wind Turbine Based EESS for Stabilizing Distribution Plant System During Fault and Islanding
Marwan Rosyadi (PT Indah Karya Persero, Indonesia)

12:30 Optimal Power Transmission of Offshore Wind Farms with Droop Based Control Strategies of Multi-terminal HVDC Systems
Nikhil Pathak and Zechun Hu (Tsinghua University, P.R. China)

12:45 Small-Signal Stability Analysis of Wind Farm Integrated into Large-Scale Power Grid
Xiao Hou, Haoran Zhao and Shuning Gao (Shandong University, P.R. China); Lin Niu (State Grid of China Technology Colleague, P.R. China)

D2_TS13: Power and Energy Engineering Planning, Management and Control_2
Room: room_7405

11:30 Dynamic Determination Method of Spinning Reserve Capacity Based on Situation Awareness of Power Systems
Zhetong Ding and Kaifeng Zhang (Southeast University, P.R. China); Yaping Li (China Electric Power Research Institute, P.R. China); Ying Wang and Kai Fan (Southeast University, P.R. China)

11:45 A Design Framework for Citizen Energy Communities in Cities: Exploring PV-storage Synergies
Ioannis Poursanidis (Joint Research Centre, European Commission, Italy); Giuliano Rancilio (Politecnico di Milano, Italy); Evangelos Kotsakis (European Commission JRC, Italy); Gianluca Fulli (European Commission, Joint Research Centre, Institute for Energy and Transport, European Union); Marcelo Masera (European Commission, The Netherlands); Marco Merlo (Politecnico di Milano, Italy)

12:00 Improvement of Safety Operating Conditions in Overhead Conductors Based on Ampacity Modeling Using Artificial Neural Networks
Roberto Fernandez Martinez (University of The Basque Country UPV/EHU, Spain); Rafael Alberdi (University of the Basque Country, Spain); Elvira Fernandez, Igor Albizu and Miren T. Bedialauneta (University of the Basque Country UPV/EHU, Spain)

Jie Ruan (Zhejiang University, P.R. China); Chang Liu (Zhejiang University); Guangdi Li, Yan Deng and Xiangning He (Zhejiang University, P.R. China)

12:30 An Optimal Strategic Portfolio of Biomass-Based Integrated Energy System
Hui Liao, Yuping Huang and Daqing Zhao (Guangzhou Institute of Energy Conversion, CAS, P.R. China)

12:45 Optimal Investment in Multi-energy Market Considering Generation and Demand Uncertainties
Yuqi Zhou, Tie Ding, Shanying Zhu, Jianping He and Bo Yang (Shanghai Jiao Tong University, P.R. China)
D2_TS14: Smart Grid Technologies and Utility Applications_2

Room: room_7301B

11:30 Design and Implementation of Intelligent Patrol Robot for Secondary Equipment Based on Lidar Technology
Li Peng and Wen Bo (State Grid Hubei Electric Power Research Institute, P.R. China); Wu Di (State Grid Hubei Electric Power Dispatching Control Center, P.R. China); Tang Xiaobing and Lu Xiaorong (Nanjing SP-NICE Technology Development Co Ltd, P.R. China)

11:45 Proof of Concept of a Cloud-Based Smart Dual-Fuel Switching System to Control the Operation of a Hybrid Residential HVAC System
Danilo Yu, King Yeung Tung, Navid Ekrami, Gulsun Demirezen, Alan S Fung and Farah Mohammadi (Ryerson University, Canada); Kaamran Raahemifar (University of Waterloo, Canada)

12:00 IEC 61850 Packet Generator for Testing Substation Communication
Douglas Paulo de Mattos, Arthur Albuquerque Zopellaro Soares, Yona Lopes and Débora Muchaluat-Saade (Fluminense Federal University, Brazil); Allan Delfino (Universidade Federal Fluminense, Brazil); Luana Uchoa (Fluminense Federal University, Brazil); Natalia Fernandes (Universidade Federal Fluminense & Midiacom, Brazil); Igor Monteiro Moraes, Célia Albuquerque, Luiz Magalhaes and Leonardo Soares (Universidade Federal Fluminense, Brazil)

12:15 ASGiRDS: Asynchronous Smart-Grids Distributed Simulator
Takai Eddine Kennouche (University of Grenoble Alpes & Laboratoire d'Informatique de Grenoble, France); Nicolas Gast (Inria, France); Florent Cadoux (Grenoble INP, France); Benoit Vinot (Roseau Technologies, France)

12:30 Control of Three-Stage AC-AC Solid State Transformer for Power Exchange Between Grids
Chengai Zhang, Huaizhi Wang, Jianchun Peng and Jianhua Yu (Shenzhen University, P.R. China)

12:45 Profit Maximization for Local Energy Trading with Different Pricing Functions
Tushar Vavaiya, Shama N. Islam and Amanullah Than Oo (Deakin University, Australia)

D2_TS15: Power Quality, Protection and Electromagnetic Compatibility_2

Room: room_7505

11:30 Lessons Learnt from Analysis of Tripping Records
Nitesh D (Power Research and Development Consultant Pvt. Ltd, India); Faraz Zafar Khan (TATA Consulting Engineers, India); Nagaraja Ramappa (PRDC, India); Pradeepkumar Surwase (Power Research and Development Consultant Pvt. Ltd, India)

11:45 Research on Uninterrupted Phase-Separation Passing Device Based on Three-Phase MMC
Zhou Ni, Jiaxin Yuan, Feiran Xiao and Yanming Ke (Wuhan University, P.R. China)

12:00 Submodule Fault Detection and Location Method for Modular Multilevel Converter Based on the Voltage Variation Observations
Kun Wang (Zhejiang University, College of Electrical Engineering); Lin Jin (College of Electrical Engineering & Zhejiang University, P.R. China); Guangdi Li, Yan Deng and Xiangning He (Zhejiang University, P.R. China)
12:15 Development of Electrical and Network Test Tool for IEC 61850 Based Power System Protection
Allan Delfino (Universidade Federal Fluminense, Brazil); Natalia Fernandes (Universidade Federal Fluminense & Midiacom, Brazil); Rainer Zanghi (Universidade Federal Fluminense, Brazil); Débora Muchalauat-Saade (Fluminense Federal University, Brazil)

12:30 A Luenberger Observer Based Optimal Dc-link Voltage Approach of Three-Phase Quasi-Z-Source Inverter
Bo Xu, Kaipei Liu and Xiaohong Ran (Wuhan University, P.R. China)

12:45 Compensation Strategy for Multiple Series Centralized Voltage Sag in Medium Voltage Distribution Network
Longfu Luo, Wang Chen, Ye Tian, Zhen Tan and Yuhang Hu (Hunan University, P.R. China)

D2_TS16: Power System Analysis_3

Room: room_7201B

11:30 Linear Models of the VSC-MTDC Systems with the Droop Controls for Power Flow Analysis
Changfeng Liao, Yi Tan, Yong Li, Yijia Cao, Yunfeng Wen and Weiyu Wang (Hunan University, P.R. China)

11:45 Studies on Accuracy of Higher Order Normal Forms Applied to Power System Analysis Using Neumann Series Convergence Criterion
Tanikella Kalyan Ram (Indian Institute of Technology, Chennai, India); S Krishna (Indian Institute of Technology Madras, India)

12:00 Analysis of Two-phase Fault Single-Phase Breaking of Small Current Grounding System Considering Capacitor Compensation
Zhuoran Hu (WuHan University, P.R. China); Yicong Tu (State Grid, P.R. China)

12:15 An Evaluation Method Based on TOPSIS for Urban Rail Transit Power Supply System
Wei Zuo, Yijia Cao, Yong Li and Bonan An (Hunan University, P.R. China)

12:30 Partial Discharge Measurement for Condition Assessment of High Voltage Cables in Power System
Kam Lam Wu, Wai Man Lee and Ka Leight So (CLP Power Hong Kong Limited, Hong Kong)

12:45 A Harmonic Detection Strategy Based on FBD Power Theory
Dong Wang, Li Zhang, Chong Wang, Shengchao Liu and Qi Liu (Hohai University, P.R. China)

D2_TS17: Power Transmission and Distribution_2

Room: room_7301A

11:30 Isolated Multi-port DC-DC Converter-Based on Bifurcate MMC Structure
Yingfei Xu and Kun Wang (Zhejiang University, P.R. China); Lin Jin (College of Electrical Engineering & Zhejiang University, P.R. China); Yan Deng (Zhejiang University, P.R. China); Yi Lu (State Grid Zhejiang Electric Power Research Institute, P.R. China); Yong Yang (State Grid Zhejiang Electric Power Co., Ltd., P.R. China)

11:45 Low-frequency Stability Analysis of the DC-link in Dual Active Bridge (DAB) Based Microgrid
Danping Zheng, Liang Chen, Heng Nian and Dan Sun (Zhejiang University, P.R. China); Liang Chen (State Grid Jiangsu Electric Power Company Electric Power Research Institute, P.R. China)
12:00 On Benefits and Challenges of Nested Microgrids
Shoaib Salim Inamdar, Rabindra Mohanty and Peiyuan Chen (Chalmers University of Technology, Sweden); Ritwik Majumder (ABB Corporate Research, Sweden); Massimo Bongiorno (Chalmers University of Technology, Sweden)

12:15 Designing Optimal Network for Rural Electrification Using Multiplier-accelerated a* Algorithm
Jerry Chun-Fung Li (ADS Engineering Ltd., Hong Kong & Colorado State University, USA); Daniel Zimmerle (Colorado State University, USA)

12:30 DC Impedance-Model-Based Stability Analysis of a VSC-MTDC System
Yuye Li and Kaipei Liu (Wuhan University, P.R. China); Kun Wang (Nari-Relays Electric Co. Ltd, P.R. China); Qing Huai, Shu Zhu and Xiaobing Liao (Wuhan University, P.R. China)

12:45 Reliability Evaluation of an Electric Power Distribution System: A Case Study in Gauteng Metropolitan Municipality
Jan Harm Pretorius, Annlizé Marnewick and August Choma (University of Johannesburg, South Africa)

Tuesday, December 3 12:00 - 16:00

D2_PS: poster session

Room: poster room

A Novel SOC Distributed Equalization Control Strategy for Energy Storage Units in DC Microgrids
Longfu Luo, Yuhang Hu, Jinhai Zou, Liwei Xie and Wang Chen (Hunan University, P.R. China)

Analysis of Credit Management and Its Effects in Yunnan Electricity Market
Minghui Yan, Chongdong Zhou and Yijie Yang (Kunming Power Exchange, P.R. China); Yueyong Yang and Tianyao Ji (South China University of Technology, P.R. China); Xuejin Wang, Jifei Wang, Jingrui Chen and Ying Zheng (Kunming Power Exchange, P.R. China)

Feasibility Evaluation for a Multi-Energy Microgrid Case Study in China
Baohua Bai (State Grid Energy Conservation Service Co., Ltd, P.R. China); Shuran Liu (ABB (China) Power Grids, P.R. China); Lingxi Bu (State Grid Energy Conservation Service Co., Ltd, P.R. China); Meng Cheng (ABB (China) Power Grids, P.R. China)

Analysis on the Adaptability of Asymmetric Single-phase Substitution for 500kV Autotransformer Considering Winding Capacitance
Xin Min, Chengjun Xia, Xuanping Li and Qian Wan (South China University of Technology, P.R. China)

Generalized Energy Storage Configuration Strategy Considering Uncertainty of Load Aggregator Response
Wei Xiang, Weiqing Sun and Liang Pei (University of Shanghai for Science and Technology, P.R. China); Peifeng Xi (Shanghai Key Laboratory of Smart Grid Demand Response, P.R. China)

Load Frequency Control in Microgrid with CHP Based on Generalized Predictive Control
Bo He and Yang Wang (State Grid Energy Research Institute, P.R. China); Xin Wang and Jun Yang (Wuhan University, P.R. China)

Research on Optimal Operation of Multi-Time Scale Cold-Thermal-Electric Integrated Energy System
Bin Oyang (Tsing Hua University, P.R. China); Zhichang Yuan, Lu Qu and Chao Lu (Tsinghua University, P.R. China)

**Control Strategy of Hybrid HVDC System Based on LCC and Hybrid MMC**
Yuzhe Xu, Zheren Zhang and Zheng Xu (Zhejiang University, P.R. China); Hui Cai and Zhenjian Xie (State Grid Jiangsu Electric Power Co., Ltd. Economic Research Institute, P.R. China)

**Comparison of Three LCC-MMC Hybrid HVDC Links Based on AC Fault Response Characteristics**
Siquan Hu, Kun Han, Hui Zhou and Shilong Gao (XJ Group Corporation, P.R. China); Zheng Xu, Xiaodong Li and Zheren Zhang (Zhejiang University, P.R. China)

**Study on Main Circuit Configuration and Control Modes for a New LCC-MMC Hybrid HVDC System**
Xiaodong Li (Zhejiang University, P.R. China); Kun Han, Caiyun Fan, Xusheng Li and Zhigang Zhang (XJ Group Corporation, P.R. China); Shijia Wang and Zheng Xu (Zhejiang University, P.R. China)

**Fuzzy Comprehensive Evaluation of Wind Turbine Operation Condition Based on Weights Calculation via Factor Analysis**
Yi Cheng and Yang Hu (North China Electric Power University, P.R. China); Ziqiu Song (North China Electric Power University, P.R. China)

**An Implementation Method of Intelligent Substation Sequence Control**
Hengxuan Li (State Grid Hubei Electric Power Research Institute, P.R. China); Yang Wang (State Grid Hubei Electric Power Company, P.R. China); Kanjun Zhang (State Grid Hubei Electric Power Research Institute, P.R. China); Shiping E (State Grid Hubei Electric Power Company, P.R. China); Peng Li and Bo Wen (State Grid Hubei Electric Power Research Institute, P.R. China)

**A Tripartite Game Model for Charging Station Service Pricing**
Xiangpeng Zhan, Jun Yang and Sining Han (Wuhan University, P.R. China)

**Torque Ripple and Switching Power Loss Minimization with Constant Band Hysteresis Current Controller for BLDC Motor**
YongKeun Lee (Seoul National University of Science and Technology, Korea)

**Network Frame Optimization Method for Defending multi-DC Commutation Failure**
Wanchun Qi and Hui Cai (State Grid Jiangsu Economic Research Institute, P.R. China); Guoteng Wang (Zhejiang University, P.R. China); Wenjia Zhang (State Grid Jiangsu Economic Research Institute, P.R. China); Xiaomei Yang (State Grid Jiangsu Electric Power Company, LTD., P.R. China); Zheng Xu (Zhejiang University, P.R. China)

**Multiple Value Evaluation for Energy Storage System**
Liang Pei, Weiqing Sun and Wei Xiang (University of Shanghai for Science and Technology, P.R. China); Hongzhong Li (Shanghai University of Electric Power, P.R. China)

**Commutation Torque Ripple Minimization for Three Phase BLDC Motor Drive Using A Simple PWM Scheme Reliable to Motor Parameter Variation**
YongKeun Lee (Seoul National University of Science and Technology, Korea)

**Improved High-frequency Model of the Converter Transformer in UHVDC System**
Shurui Mao, Zheng Xu and Chenxi Luo (Zhejiang University, P.R. China)

**Analysis of Torque Ripple and Its Peak Value, if Any Phase Current Shift Error for BLDC Motor Drive**
YongKeun Lee (Seoul National University of Science and Technology, Korea)

Stability Analysis of More Electric Aircraft FC-APU Power Distribution System
Jiazhu Xu, Jing Xia, Weipeng Zhuang, Ziyi Bai and Yipeng Lu (Hunan University, P.R. China)

A Multi-operating Mode Multi-port DC/DC Converter with High Step-up Voltage Gain
Yang Huang (China Three Gorges University & College of Electrical Engineering & New Energy, P.R. China); Binxin Zhu, Shishi Hu and Wang Hui (China Three Gorges University, P.R. China)

Transient Stability Mechanism Analysis Considering Characteristics of Half-Wavelength Lines
Hao Tian and Yutian Liu (Shandong University, P.R. China)

Low Torque Ripple Synchronous Reluctance Machine with Stator Cage Winding
Matthias Pohl (Bundeswehr University Munich, Germany); Dieter Gerling (University of Federal Defence Munich, Germany)

Dynamic Ice Load Alleviation of Offshore Wind Turbine via Optimized Pitch Control
Ziqiu Song (North China Electric Power University, P.R. China); Yi Cheng and Huipan Wang (North China Electric Power University, P.R. China)

Research on Micro-Grid Electric Energy Transaction Mechanism Based on Master-Slave Smart Contract
Xin Peng, Bin Duan and Xiangxiang Xiao (Xiangtan University, P.R. China)

Coordinated Voltage Control of a Wind Farm Considering the Impact of Voltage Support Ability from the Integrated Grid
Zhe Zhang and Wang Chengfu (Shandong University, P.R. China); Hao Zhang (State Grid Zhumadian Power Supply Company, P.R. China)

Induced Voltage Optimization of a Direct-Drive Multi-Phase Permanent Magnet Vernier Generator for Tidal Energy Conversion
Zaixin Song and Chunhua Liu (City University of Hong Kong, Hong Kong)

Comparative Study on DC Line Fault Transient Characteristics of Four Typical MMC-HVDC Configurations
Ming Yan (Zhejiang University, P.R. China); Lingyun Chen, Gaihong Chen and Qiongfang Wang (Central Southern China Electric Power Design Institute Co., Ltd., P.R. China); Zheren Zhang and Zheng Xu (Zhejiang University, P.R. China)

Charging Facilities Planning for Electric Vehicles Based on the Mean Clustering
Ning Wang, Wang Chengfu and Zhe Zhang (Shandong University, P.R. China)

Emergency Control Strategy for Sending-End Power Grid Under UHVDC Blocking Fault
Meng Zhou (Harbin Institute of Technology & Nanjing Power Supply Company, P.R. China); Ziyue Liu (Harbin Institute of Technology, P.R. China); Ruiye Liu (Harbin Institute of Technology (HIT), P.R. China)

Study on Radio Interference of ±1100 kV Converter Station
Jingqiu Yu and Zheng Xu (Zhejiang University, P.R. China); Bo Yue and Xuan Li (State Grid Economic And Technological Research Institute State Grid, P.R. China)

Security Vulnerability Assessment of SCADA System Based on Knowledge Reasoning and Bayesian Network
Xinyu Luo, Bin Duan and Xin Peng (Xiangtan University, P.R. China); Li Tao (University of XiangTan, P.R. China)

The Discrete-Time Model Following Controller for a Virtual Synchronous Generator
Atsushi Umemura, Rion Takahashi and Junji Tamura (Kitami Institute of Technology, Japan)

Linear Optimization of Reinforcements in Medium Voltage Grids in Respect to Increasing Load Behavior
Christoph Blaufuß (Leibniz University Hannover, Germany); Lutz Hofmann (Leibniz Universität Hannover, Germany)

Voltage Mitigation and Reactive Power Requirements for an Industrial Plant
Ayman Alabduljabbar (King Abdulaziz City for Science and Technology, Saudi Arabia); Yasir Alturki (Saudi Arabia); Abdulmajeed Almalki (Researcher, Saudi Arabia)

Start-up Sequence Optimization of Units and HVDC for Hybrid Multi-Infeed DC Receiving Systems
Peng Li and Hongtao Wang (Shandong University, P.R. China); Dong Yang, Huan Ma and Kang Zhao (State Grid Shandong Electric Research Institute, P.R. China)

Bifurcation Theory Based Voltage Stability Analysis of Power System Integrated with Large Scale Front-end Speed Regulated Wind Generators
Hongwei Li, KaiDe Ren, Shuaibing Li and Haiying Dong (Lanzhou Jiaotong University, P.R. China)

Pei Luo (XiangTan University, P.R. China); Yan Wen and Yawen Xie (Xiangtan University, P.R. China)

A Novel Built-in Metal Foil Sensor for PD Detection of HV Cables
Hongdong Lin (Zhongshan Power Supply Bureau of the Guangdong Power Grid Corporation, P.R. China); Wenzhe Li (Huazhong University of Science and Technology, P.R. China); Yijiang Wu and Gangjun Wang (Zhongshan Power Supply Bureau of the Guangdong Power Grid Corporation, P.R. China); Xiaosheng Peng, Jinshu Li and Ashfaque Bhatti (Huazhong University of Science and Technology, P.R. China)

An Incentive Pricing Approach for Integrated Demand Response in Multi-energy System Based on Consumer Classification
Zixin Wang, Xiaoyan Zhang, Shanying Zhu and Bo Yang (Shanghai Jiao Tong University, P.R. China)

Enhancing Distribution System Resilience to Extreme Weather Using Multi-Energy Coordination
Yaxin Du, Tingting Zhang and Wen Zhang (Shandong University, P.R. China)

A Grid-Interfaced Single Phase AC-DC Dual Active Bridge Converter with Enhanced Power Decoupling Technique
Jiatu Hong, Jian Lu and Jian Yin (Shenzhen University, P.R. China)

The Adjustment Method and Effect of Reactive Power Control Strategy for LCC-HVDC with Variable Power
Hou Junxian (ABB China, P.R. China)

A Comprehensive Review on MPC: Applications on Wind Turbines and FPGA Implementations
Xiaochen Lu, Haoran Zhao and Jia Luo (Shandong University, P.R. China); Qiang Ma (State Grid Corporation of China, P.R. China); Lin Niu (State Grid of China Technology Colleague, P.R. China)

Short-term Wind Power Forecasting Based on BOMLS K-means Similar Hours Clustering Method
Gang Wang and Liang Jia (Northeastern University, P.R. China)
Power Flow Calculation Method of DC Grid with Interline DC Power Flow Controller (IDCPFC)
Danni Cheng (Xi'an JiaoTong University, P.R. China); Jianlong Zou (Xi'an JiaoTong University, P.R. China)

Application of Multi-Camera Tracking and Positioning Technology in Substation
Guifeng Zhang, Zhiren Tian, Yongli Liao and Song Wang (Electric Power Research Institute, CSG, P.R. China); Wutao Chen (South China University of Technology, P.R. China)

The Hardware Implementation of FPGA-Based Electromagnetic Transient System for New Energy Components
Liqian Xie (Shanghai Jiao Tong University, P.R. China); Yinxing Xiang (Fujian Electric Power Research Institute, P.R. China); Qing Mu (China Electric Power Research Institute, P.R. China); Guanghui He (Shanghai Jiao Tong University, P.R. China)

Multi-dimensional Risk Assessment Method for Electric Transmission Line
Feifei Huang (Shanghai China Classification Society Rules & Technology Center, P.R. China); Shaocheng Jiang (Shanghai Haineng Information Technology Co., Ltd., P.R. China); Zhengyang Liu and Yi Jiang (Nanjing NARI Group Corp, State Grid Electric Power Research Institute, P.R. China); Zihan Cong (Shanghai Jiao Tong University, P.R. China)

Control Strategy to Smooth Wind Power Fluctuations of PMSG Wind Turbine Based on the Secondary Exponential Moving Average Method
Yang Zhou and Lihui Yang (Xi'an JiaoTong University, P.R. China)

Distribution Locational Marginal Pricing for Energy Storage Through Robust Optimization
Han Wu and Yue Yuan (Hohai University, P.R. China); Xinsong Zhang (Nantong University, P.R. China); Junpeng Zhu and Xiaofeng Luo (Hohai University, P.R. China)

Identification and Location for Phase-to-Ground Fault with Magnetic Sensing in Power Distribution Network: Principle and Practical Implementation
Ke Zhu (the University of Hong Kong, Hong Kong); King Hang Lam and Philip W. T. Pong (The University of Hong Kong, Hong Kong)

The Equivalent Circuit Model of a Four-Winding Inductive Filtering Transformer and Its Filtering Characteristics
Yuehui Chen (State Grid Hunan Electric Power Co., Ltd, P.R. China); Zhao Huang (Hunan University, P.R. China); Zhenfeng Duan (State Grid Hunan Electric Power Co., Ltd, P.R. China); Chen Li (Hunan University, P.R. China)

Reactive Power Optimization Algorithm of Active Distribution Network Based on Improved Quantum Particle Swarm Optimization
Zhihao Ning and Can Wang (State Grid Hunan Electric Power Company Limited Research Institute, P.R. China); Wei Deng, Xu Jia Zhu and Longtao Jia (Hunan University, P.R. China)

Study on Protection Principle of Novel Filtering Transformer Based on Coupled Inductance
Yuehui Chen (State Grid Hunan Electric Power Co., Ltd, P.R. China); Jing Sun (Hunan University, P.R. China); Pengwu Fu (State Grid Hunan Electric Power Co., Ltd, P.R. China); Wang Chen (Hunan University, P.R. China)

System-level Control Strategy of UPFC in Regional Power Grids
Jian Yang, Zheyang Yu, Zheng Xu and Chaonan Ying (Zhejiang University, P.R. China); Guangzeng You (Yunnan Power Grid Co., Ltd, P.R. China)
Transmission Line Parameter Identification Based Enhanced Coupled Recursive Least Squares Algorithm  
Tang Guanjun (NARI Technology Development Co. Ltd, P.R. China)

Selection of Appropriate Light Sources in Plant Factories  
Yumika Suga and Shin’ya Obara (Kitami Institute of Technology, Japan)

Design of Magnetic Cores for Current Transformer Energy Harvesting Devices  
Wen Zhou (Nanjing, P.R. China); Zhengyang Liu, Yi Jiang and Qingqing Huang (Nanjing NARI Group Corp, State Grid Electric Power Research Institute, P.R. China); Zihan Cong (Shanghai Jiaotong University, P.R. China)

Distributed Optimal Active Power Control of a Wind Farm Based on Fast ADMM  
Mingzhe Han, Haoran Zhao and Zhaoao Lv (Shandong University, P.R. China); Lin Niu (State Grid of China Technology Colleague, P.R. China)

Optimal Dispatching of Virtual Power Plant Considering Hydrogen Storage System  
Qianheng Gao, Yue Yuan, Junpeng Zhu, Han Wu and Xiaofeng Luo (Hohai University, P.R. China)

Research on the Control Strategy of Induction Power Supply for Distribution Network Lines  
Jian Fang (Guangzhou Power Supply Bureau Co., Ltd., P.R. China); Jixing He, Hang Zhang, Hongbin Wang, Wenxiang Mo and Yong Wang (Guangzhou Power Supply Bureau Co., Ltd., P.R. China); Zihan Cong (Shanghai Jiaotong University, P.R. China)

A Novel Cost-Effective AC-DC Power Supply for Indoor LED Lighting Applications  
Chun-An Cheng, Yi-Ling Chen, Ya-Jing Chen and Su-Wun Lai (I-Shou University, Taiwan)

Optimal Power Dispatch Strategy for Multiple Battery Containers in a Grid-scale BESS Station  
Shu Wang, Fan Yang and Xiaohui Bai (State Grid Beijing ETRI, P.R. China); Shuran Liu (ABB (China) Power Grids, P.R. China); Lingxi Bu (State Grid Energy Conservation Service Co., Ltd, P.R. China)

Research on Quick Detection of Abnormal Events in Power Grid Based on the Large Dimensional Random Matrix Theory  
Feng Huang, Hua Huang, Ran Chen and Lu Liu (Shanghai, P.R. China); Yingjie Yan (Shanghai Jiaotong University, P.R. China)

DC Short Faults and Fault Current Limiting Technologies in Flexible DC Grid: A Review  
Yangzheng Guo (Hunan University, P.R. China)

Model Predictive Control of Modular Multilevel Grid Simulator  
Han Rong and Xu Qianming (Hunan University, P.R. China); Hongqi Ding (CRRC ZIC Research Institute of Electrical Technology&Material Engineering, P.R. China)

Study on the Permanent Magnet Synchronous Motor and Matching Design Method Based on Global Optimal Annual Power Loss of Pump  
Jian Gao and Rui Li (Hunan University, P.R. China); Wenjum Zhang (Changsha University, P.R. China); Litao Dai and Ruzhao Mo (Hunan University, P.R. China)

Real-time Detection Approach: Applied to Potential Transformer-based Over-voltage Monitoring  
Cui Xiaolong (Huazhong University of Science and Technology, P.R. China); Zhaozhong Li (Huazhong University of Science & Technology, P.R. China); Zhou Yuan (Electric Power Research Institute Guangdong Power Grid Co., Ltd., P.R. China); Yin Kangyong (Electric Power Research Institute, Jiangsu Electric Power Company, P.R. China)
A Single-Stage Flyback LED Driver Based on Energy Distribution Without Electrolytic Capacitor
Li ZhenZhen (hunan University, P.R. China); Mingqian Guo (Jianxi Nanchang China, East China Jiao Tong University, P.R. China); Jin Xin, RenJie Sun, Hongliang Wang and Xiumei Yue (HuNan University, P.R. China)

Improved Model Predictive Control for Mitigating False Data Injection on Cascaded H-Bridge Inverters
Rao Rao (Chongqing University, P.R. China); Zhaoxi Liu and Lingfeng Wang (University of Wisconsin-Milwaukee, USA); Shiying Hou and Yingqiao He (Chongqing University, P.R. China)

EPON Communication Network Topology Optimization Based on Electrical Nodes’ Importance in Active Distribution Networks
Yingqiao He (Chongqing University, P.R. China); Li Ma and Lingfeng Wang (University of Wisconsin-Milwaukee, USA); Junjie Tang and Rao Rao (Chongqing University, P.R. China)

Transmission Line System Modeling and Lightning Transient Response Analysis
Lin Huang, Lijun Zhou, Dong Zhang, Jingfu Zhang and Xue Chen (Southwest Jiaotong University, P.R. China)

An Energy-feedback Method for Single-Stage LED Drivers to Eliminate Low-Frequency Current Ripple
Mingqian Guo and Zhongqi Li (Jianxi Nanchang China, East China Jiao Tong University, P.R. China); Li ZhenZhen (hunan University, P.R. China); Xinyue Chen, Xiumei Yue and Hongliang Wang (HuNan University, P.R. China)

Study on an Energy Supply System Assuming a Pipeline Transportation of Compressed Hydrogen in China
Jiaren Li and Shin’ya Obara (Kitami Institute of Technology, Japan)

Heavy Overload Forecasting of Distribution Transformers Based on XGBoost
Qian Wu, Zheng Chen and Hongtian Su (China Electric Power Planning & Engineering Institute, P.R. China); Zhang Dongxia (China Electric Power Research Institute, P.R. China)

An Equivalent Circuit for the Single-sided Linear Induction Motor Secondary Width Optimization
Zhiyong Lan (XiangTan University, P.R. China); Cai Chen (Xiangtan University, P.R. China)

Research on the Disturbance Detection Method Based on Random Matrix Eigenvalue
Wenhui Zhang, Hua Huang, Ran Chen and Lu Liu (Shanghai, P.R. China); Yingjie Yan (Shanghai Jiaotong University, P.R. China)

Single Neuron Speed Control Based on Current FAC for PMSM Vector Control
Di Hu (Hunan University, P.R. China)

Multi-objective Optimization of the Motor with the Novel Halbach Permanent Magnet Array
Xiao Liu, Dandan Wan and Zimeng Wang (Hunan University, P.R. China)

An Islanded Microgrid with Novel Fault Tolerant Inverter
Yan Li (School of automation, Central South University)

A Robust Framework Design of IoT Monitoring Device for Power Distribution Network
Liang Chen, Meng-Meng Jia and Xiao-Dong Yuan (State Grid Jiangsu Electric Power Company Research Institute, P.R. China); Lu-Jia Zhao (North China Electric Power University, P.R. China); Yu-Ling He (North China Electric Power University, P.R. China)

Integral Sliding Mode Compound Control Strategy for Quasi-Z Source Grid-Connected Inverter
Meichen Pan, Caixue Chen and Da Zhang (Xiangtan University, P.R. China)

Optimal Operation and Price Decision of Multi-energy Park Based on Electro-thermal Demand Response
Yuying Shi and Li Yang (Southeast University, P.R. China)

Robust Island Partition of Active Distribution Network
Wanjun Lin, Yue Yuan, Xiaofeng Luo and Junpeng Zhu (Hohai University, P.R. China)

A Novel Fault Tolerant Inverter for Islanded Microgrid
Yan Li (School of automation, Central South University); Peng Xiang (Central South University, P.R. China)

Discussion About Recent Applications of Power Big Data in Smart Grid
Qilin Hou (University of Macau, Macao); Jia Zhen (State Grid Shanxi Electric Power Company, Macao); Li Liu (University of Macau, Macao); Ning Qiang (State Grid Shanxi Electric Power Company, Macao)

Optimal Day-Ahead Scheduling in AC/DC Hybrid Distribution Networks Based on SOCP
Wei Sun (University of Shandong, P.R. China); Wen Zhang, Tingting Zhang and Yaxin Du (Shandong University, P.R. China)

Study on Reliability Assessment of Power Supply in Energy System
Xiaobing Xiao, Yu Fu, Huan Li, Qifeng Long, Ruifeng Zhang, Mian Wang, Anjiang Liu, Hongliu He and Youzhuo Zheng (Electric Power Research Institute of Guizhou Power Grid Co., Ltd., P.R. China); Juanwei Chen and Xuehan Zhang (South China University of Technology, P.R. China)

Reliability Evaluation Method for the Electricity-gas Coupled System Considering Correlation
Xiaobing Xiao, Yu Fu, Huan Li, Youzhuo Zheng, Anjiang Liu, Qifeng Long, Hongliu He and Peng Wu (Electric Power Research Institute of Guizhou Power Grid Co., Ltd., P.R. China); Xuehan Zhang and Juanwei Chen (South China University of Technology, P.R. China)

Design and Comparison of Segmented Armature Windings for Superconducting Wind Turbine Generators with Multiple Converters
Dong Liu and Feng Wu (Hohai University, P.R. China); Ping Ju (Hohai University, P.R. China); Chong Wang (Hohai University, P.R. China); Xiaowei Song (Vestas Wind Systems A/S, Denmark)

Study on Transient Stability Constrained Optimal Power Flow Model of VSC-MTDC Transmission System Based on Phase Trajectory Concavity-convexity
Zhuyi Peng, Hui Cai, Xingning Han and Bailiang Liu (State Grid Jiangsu Economic Research Institute, P.R. China); Chaonan Ying and Zheng Xu (Zhejiang University, P.R. China)

Research on Optimization for Siting and Sizing of Distributed Generation Considering Wind and Light Abandonment and Environmental Cost
Qian Ma (Xiangtan University, P.R. China); Ying Zhang (XiangTan University, P.R. China); Yan Wen (Xiangtan University, P.R. China)

Hierarchical Optimal Operation Strategy for Multi Micro Energy Systems Within Distribution System
Sumeng Tao (Southeast University, P.R. China); Xianbo Du (Jiangsu Fangtian Electric Power Technology Co., Ltd, P.R. China)

**Research on the Correlation of Wind Farms’ Outputs Based on Fluctuation Division and Time Shift Technique**
Dajun Jiang (China Electric Power Research Institute, P.R. China); Yingjun Wu and Feng Wu (Hohai University, P.R. China); Yanfeng Ge (Liaoning Province Electricity Power Company Ltd, P.R. China)

**Control Strategy to Mitigate Risk of Hybrid HVDC Continuous Commutation Failure**
Zizhao Lin (Shenzhen Power Supply Bureau, P.R. China); Chengxiang Li (Electric Power Research Institute of China Southern Power Grid, P.R. China); Chengjun Xia (South China University of Technology, P.R. China); Xiaofeng He (Shenzhen Power Supply Bureau, P.R. China); Wenfeng Yao (Electric Power Research Institute of China Southern Power Grid, P.R. China); Xin Min (South China University of Technology, P.R. China)

**Disturbance Observer Based Generalized Wind/Solar Consistent Control Strategy for AC Microgrids**
Dehao Qin, Rui Wang, Qiuye Sun and Xuemeng Zhang (Northeastern University, P.R. China)

**Tuesday, December 3 14:00 - 15:30**

**D2_Invited_03: The application of the new generation of Artificial Intelligence (AI) in smart grid**

Room: room_7404

Dr. Wei HU, Associate Professor of Tsinghua University, Beijing, China; Dr. Wenpeng LUAN, Professor of Tianjin University, Tianjin, China; Dr. Xiaosheng PENG, Associate Professor of Huazhong University of Science and Technology (HUST), Wuhan, China; Dr. Xing HE, Associate Professor of Shanghai Jiaotong University, Shanghai, China; Dr. Bo WANG, Professor of Wuhan University, Wuhan HUBEI Province, China

**D2_TS18: Renewable & Sustainable Energy_4**

Room: room_7504

14:00 *Virtual Synchronous Generator Control of Power System Including Large Wind Farm by Using HVDC Interconnection Line*
Sho Niino, Atsushi Umemura, Rion Takahashi and Junji Tamura (Kitami Institute of Technology, Japan); Yoshiharu Matsumura, Fumihito Tosaka and Ryosuke Nakamoto (Hokkaido Electric Power Co., Inc., Japan)

14:15 *Influence of Electrical Contact Resistance Within Cable Joint Operation in Australian Wind Farms*
Ashley P Clifton, Amanullah Than Oo and Mohammad Arif (Deakin University, Australia)

14:30 *Optimal Utilization of Reactive Power Capability of DFIG Based Wind Turbine by the Improved GRG Method*
Shuheng Chen, Yueshan Huang, Weihao Hu and Yang Han (University of Electronic Science and Technology of China, P.R. China); Qunying Liu (University of Electronics Science and Technology of China, USA)

14:45 *Partial Curtailment to Firm Photovoltaic Generation Dispatch*
Kanyawee Keeratimahat, Anna Bruce and Iain MacGill (University of New South Wales, Australia)

15:00 Virtual Inertia Control Strategy for Battery Energy Storage System in Wind Farm
Ruixu Liu and Zhen Wang (Zhejiang University, P.R. China); Huadong Xing (Inner Mongolia Power Research Institute, P.R. China)

15:15 An Adaptive Ramp-Rate Control for Photovoltaic System to Mitigate Output Fluctuation
Qixiang Xu (XJTLU, P.R. China); Huadong Xing (Inner Mongolia Power Research Institute, P.R. China); Yinxiao Zhu and Xingshuo Li (XJTLU, P.R. China)

D2_TS19: Power and Energy Engineering Planning, Management and Control_3

Room: room_7405

14:00 A Combined Heat and Power System Operation Model Considering Heat Demand Characteristics of Different Buildings
Hai-Xia Wang (School of Electrical Engineering, Dalian University of Technology, P.R. China); Hongli Tang (Dalian University of Technology, P.R. China)

14:15 Robustness Test Method of Power Flow System Containing Controllable and Fluctuating Power Devices
Saher Javaid (Japan Advanced Institute of Science and Technology (JAIST), Japan); Kaneko Mineo (Japan Advanced Institute of Science and Technology, Japan); Yasuo Tan (Japan Advanced Institute of Science and Technology & National Institute of Information and Communications Technology, Japan)

14:30 A Distributionally Robust Chance Constrained Planning Method for Integrated Energy Systems
Jingdong Zhou (State Grid Fujian Electric Power Co., Ltd. Xiamen Power Supply Company, P.R. China); Wenliang Liu (State Grid Xiamen Electric Power Supply Company, P.R. China); Xiang Chen, Mingjie Sun and Chao Mei (State Grid Fujian Electric Power Co., Ltd. Xiamen Power Supply Company, P.R. China); Shuaijia He, Hongjun Gao and Junyong Liu (Sichuan University, P.R. China)

14:45 Power Flow Management: Solvability Condition for a System with Controllable and Fluctuating Devices
Saher Javaid (Japan Advanced Institute of Science and Technology (JAIST), Japan); Kaneko Mineo (Japan Advanced Institute of Science and Technology, Japan); Yasuo Tan (Japan Advanced Institute of Science and Technology & National Institute of Information and Communications Technology, Japan)

15:00 Improving Hosting Capacity of Unbalanced Distribution Networks via Battery Energy Storage Systems
Bo Wang and Cuo Zhang (The University of New South Wales, Australia); Ke Meng (UNSW Sydney, Australia); Bin Liu (The University of New South Wales, Australia); Zhaoyang Dong (University of New South Wales, Australia); Peter Wong (Jemena Limited, Australia); Tian Ting (AusNet Services, Australia); Qu Qi (State Grid International Development Pty Ltd, P.R. China)

Wang Chenggen (Jiangsu Electric Power Company Research Institute, P.R. China); Hongfen Cui (China Electric Power Research Institute, P.R. China); Hongyi Li (Nanjing University of Science and Technology, P.R. China); Xinzhen Feng (China Electric Power Research Institute, P.R. China); Qian Zhou (Electric Power Research Institute of State Grid Jiangsu Electric Power Company, P.R. China)

D2_TS20: Smart Grid Technologies and Utility Applications_3
14:00 A Microgrid System with Multiple Island Detection Strategies
Haitao Wu (Shenzhen Power Supply Bureau Co., Ltd, P.R. China); Yi-Fei Zhang, Rui Chen and Kai Ding (CYG SUNRI CO., LTD, P.R. China); De-Qiang Gong (CYG SUNRI CO., LTD); Shanglin Dai (Shenzhen Power Supply Bureau Co., Ltd, P.R. China); Yi Wei (ELECTRIC POWER RESEARCH INSTITUTE CSG, P.R. China); Yang Yu (China Southern Power Grid & Electric Power Research Institute, P.R. China); Hao Yao (ELECTRIC POWER RESEARCH INSTITUTE, CSG, P.R. China)

14:15 Research on Autonomous Frequency Modulation and Voltage Regulation Method of Microgrid Based on Immunity Selection-particle Swarm Optimization (ISPSO)
Du Yu (Shenzhen Power Supply Bureau Co., Ltd., P.R. China); De-Qiang Gong, Kai Ding and Rui Chen (CYG SUNRI CO., LTD, P.R. China); Huiqin Wang (China Southern PowerGrid of Shenzhen, P.R. China); Xi Wei (ELECTRIC POWER RESEARCH INSTITUTE CSG, P.R. China); Hao Yao (ELECTRIC POWER RESEARCH INSTITUTE, CSG, P.R. China); Yang Yu (China Southern Power Grid & Electric Power Research Institute, P.R. China)

14:30 Error Analysis of Ultra Short Term Wind Power Prediction Model and Effect on the Power System Frequency
Xiaofan Zhu, Rui Chen, Kai Ding and De-Qiang Gong (CYG SUNRI CO., LTD, P.R. China); Xi Wei (ELECTRIC POWER RESEARCH INSTITUTE CSG, P.R. China); Hao Yao (ELECTRIC POWER RESEARCH INSTITUTE, CSG, P.R. China); Yang Yu (China Southern Power Grid & Electric Power Research Institute, P.R. China)

14:45 An Ensembled ELMs Based Defense Mechanism Against Cyber Attack on Power Systems
Wenli Xue, Huaizhi Wang, Ting Wu, Jianchun Peng and Yangyang Liu (Shenzhen University, P.R. China)

15:00 Design of Voltage Source Back-To-Back Converter with Bidirectional Flow of Energy
Jianhua Yu, Huaizhi Wang, Jianchun Peng and Chengai Zhang (Shenzhen University, P.R. China)

15:15 Fault Electricity Metering Detection Using A Rule-based Model Tuned by Particle Swarm Optimization
Panisin Fuangfung (Kasetsart University & Provincial Electricity Authority, Thailand); Pisut Raphisak (Kasetsart University, Thailand)

D2_TS21: Power Quality, Protection and Electromagnetic Compatibility_3

14:00 Study on Current Sharing Characteristics of Arrester for UHV DC
Ziwei Jiang, Jiaxin Yuan, Pengcheng Gan, Zhewei Zhang and Zhaoyang Zhang (Wuhan University, P.R. China)

14:15 The Influence of Complex Environmental Conditions on the Corrosion Degree of Outdoor Typical Transformer Equipments
Chentao Li (Guangzhou Power Supply Bureau of China Southern Power Grid, P.R. China); Xiaopeng Su and Zhaobin Du (South China University of Technology, Tianhe District, Guangzhou, Guangdong, P.R. China); Libo Lin (Guangzhou Power Supply Bureau of China Southern Power Grid, P.R. China); Ling Luo, Wenjun Ning and Delin Lai (South China University of Technology, Tianhe District, Guangzhou, Guangdong, P.R. China); Xiaojie Liu (South China University of Technology, P.R. China)

14:30 A Compound Control Strategy of Dynamic Voltage Restorer Based on Multiple Winding Transformer
Longfu Luo, Yimeng Zhang, Jinhai Zou and Weipeng Zhuang (Hunan University, P.R. China)

14:45 A Narrow Bandwidth Detection Method for Inter-Harmonics in Tokamak Power Supply
Yunxiang Tian and Liwei Xu (Institute of Plasma Physics, Chinese Academy of Sciences, P.R. China); Jing Lu and Yanan Wu (Institute of Plasma Physics, Chinese Academy of Sciences, P.R. China); Junmin Zhang (South-Center University for Nationalities, P.R. China)

15:00 Research on Hybrid Active Power Filter with Low Frequency Suppression for EAST Power Supply
Xianshun Shen (Institute of Plasma Physics, Chinese Academy of Sciences, P.R. China); Ge Gao (Institute of Plasma Physics, Chinese Academy of Sciences, P.R. China); Yunxiang Tian (Institute of Plasma Physics, Chinese Academy of Sciences, P.R. China); Yanan Wu, Huafeng Mao, Jing Lu and Li Jun (Institute of Plasma Physics, Chinese Academy of Sciences, P.R. China)

D2_TS22: Power Transmission and Distribution_3

Room: room_7301A

14:00 Maintenance Scheduling of Distribution Reclosers Using RCM Techniques
Nutniti Walliyamethee and Komsan Hongsombut (Kasetsart University, Thailand)

14:15 Situation Forecasting Method for Distribution Network Based on Phasor Measurement Unit
Shuxin Tian, Kunpeng Li and Yang Fu (Shanghai University of Electric Power, P.R. China); Shu Liu (Nationality State Grid Shanghai Electric Power Supply Company, P.R. China); Shurong Wei (Shanghai University of Electric Power, P.R. China); Huanhuan Fang (Nationality State Grid Shanghai Electric Power Supply Company, P.R. China)

14:30 A Real-Time Hybrid Modular Multilevel Converters Emulator for Hardware-in-Loop-Tests
Xinyu Rao and Gang Wang (Shanghai Jiao Tong University, P.R. China); Yinxing Xiang (Fujian Electric Power Research Institute, P.R. China); Qing Mu (China Electric Power Research Institute, P.R. China); Guanghui He (Shanghai Jiao Tong University, P.R. China)

14:45 Leakage Currents Separation of Cross-bonded Cables Based on Sheath Current Vector Difference
Haoming Wang (State Grid Tianjin Electric Power Corporation, P.R. China); Taiwei Liu and Xiaosheng Peng (Huazhong University of Science and Technology, P.R. China); Hao Zhou and Xiaochuan Shi (Wuhan Fujianda Electrical Technology Co., Ltd, P.R. China)

15:00 Fault Detection and Locating Using Electromagnetic Time Reversal (EMTR) Technique for HVDC Transmission Network
Krunal Tailor and Abhisek Ukil (University of Auckland, New Zealand)

Tuesday, December 3 16:00 - 17:30

D2_Invited_04: Control and Optimization in Flexible Energy Systems: Modern Approximation Theory and Application

Room: room_7404

Dr. Yiwei Qiu, Post-Doctoral Research Fellow, Department of Electrical Engineering, Tsinghua University, Beijing, China;
Dr. Hao Wu, Associate Professor, Zhejiang University;
Yingtian Chi, Ph.D. student, Department of Electrical Engineering, Tsinghua University, Beijing, China; Kaixuan Chen, Ph.D. student, Department of Electrical Engineering, Tsinghua University, Beijing, China;

**D2_TS23: Renewable & Sustainable Energy**

Room: room_7504

16:00 **Integrated Control with De-loading and Virtual Inertia for DFIG Support Grid Frequency Under Cyber Uncertainty**
Yangyang Liu, Huaizhi Wang, Jianchun Peng and Wenli Xue (Shenzhen University, P.R. China)

16:15 **D-Q Small-Signal Impedance Modeling of Load Virtual Synchronous Machine and Stability Analysis in Weak Grid**
Xiangyu Wang, Yandong Chen and Guo Jian (Hunan University, P.R. China); Wu Wenhua (Hunan Univ, P.R. China)

16:30 **Frequency Control Approach by Controlling Output Power of Renewable Energy Sources Considering the Priority of Power Adjustment**
Lei Liu (University of the Ryukyus, Japan); Tomonobu Senju (Faculty of Engineering, University of the Ryukyus, Japan); Takeyoshi Kato (Nagoya University, Japan); Paras Mandal (University of Texas at El Paso, USA); Ashraf M. Hemeida (Faculty of Engineering, Aswan University, Egypt); Mamdouh Abdel-Akher (Aswan University & Faculty of Engineering, Egypt)

16:45 **Two-stage Robust Optimization Method for Day-ahead Scheduling Considering Renewable Portfolio Standard**
Lupeng Qiao (Tsinghua University, P.R. China); Ling Dong (State Grid Qinghai Electric Power Company, P.R. China); TianWen Zheng (Sichuan Energy Internet Research Institute, Tsinghua University, P.R. China); LaiJun Chen (Tsinghua University, P.R. China)

17:00 **Photovoltaic System Performance Model for Output Power Forecasting**
Aaron Keith Y. Chan and Erees Queen Macabebe (Ateneo de Manila University, Philippines)

17:15 **Mobile Energy Storage Scheduling for AC-DC Microgrids Enabling Low-carbon Airport**
Mingjuan Wang, Youbo Liu and Junyong Liu (Sichuan University, P.R. China); Yuxuan Tao (Southwest Branch of State Grid Corporation, P.R. China); Weiting Xu and Jing Gou (State Grid Sichuan Electric Power Company, P.R. China)

**D2_TS24: Power and Energy Engineering Planning, Management and Control**

Room: room_7405

16:00 **Transient Stability Enhancement of Power System Including Large-Scale Wind Farm by the Coordinated Control of Adjustable-Speed Pumped-Storage Generator and Battery**
Seiya Goto, Atsushi Umemura, Rion Takahashi and Junji Tamura (Kitami Institute of Technology, Japan); Yoshiharu Matsumura, Fumihito Tosaka and Ryosuke Nakamoto (Hokkaido Electric Power Co., Inc., Japan)

16:15 **Stabilization Control of Power System with Large-Scale Wind Farm by HVDC Interconnection Line**
Ayaka Nakamura, Atsushi Umemura, Rion Takahashi and Junji Tamura (Kitami Institute of Technology, Japan); Yoshiharu Matsumura, Fumihito Tosaka and Ryosuke Nakamoto (Hokkaido Electric Power Co., Inc., Japan)
16:30 Frequency Control of Power System with Renewable Power Sources by the Coordinated Control of HVDC Interconnection Line and Battery
Shoyu Onuka, Atsushi Umemura, Rion Takahashi and Junji Tamura (Kitami Institute of Technology, Japan); Yoshiharu Matsumura, Fumihito Tosaka and Ryosuke Nakamoto (Hokkaido Electric Power Co., Inc., Japan)

16:45 Research on SOC Weighted Control Method of Energy Storage System Based on Fuzzy Logic Control Theory
Qing Ding (Shenzhen Power Grid, P.R. China); Xiao Yuan, Xiaofan Zhu, Kai Ding, Rui Chen, De-Qiang Gong and Sai-Li Wang (CYG SUNRI CO., LTD, P.R. China); Xi Wei (ELECTRIC POWER RESEARCH INSTITUTE CSG, P.R. China); Yuming Zhao (Shenzhen Power Grid, P.R. China); Yang Yu (China Southern Power Grid & Electric Power Research Institute, P.R. China); Hao Yao (ELECTRIC POWER RESEARCH INSTITUTE, CSG, P.R. China)

17:00 Research on Smooth Transfer Control Strategy for Master-slave Microgrid
Hao Sun and Haifeng Liang (North China Electric Power University, P.R. China)

17:15 Optimal Planning of Integrated Electricity and Natural Gas System Based on C&CG Algorithm
Hongkai Zhang and Jian Chen (Shandong University, P.R. China); Yicheng Zhang (School of Electrical and Electronic Engineering Nanyang Technological University & Rolls-Royce @ NTU Corp Lab, Singapore)

D2_TS25: Smart Grid Technologies and Utility Applications_4
Room: room_7301B

16:00 Vertex-wise NLMS Algorithm for Signal Reconstruction of DC Power Flow
Minseok Seo, Jaepil Ban and Sang Woo Kim (POSTECH, Korea)

16:15 Data Expansion for Foreign Object Detection in Power Grid
Jintao Shi, Chaoyue Gu, Hui Sun, Jiangang Shen and Zhe Li (Shanghai Jiao Tong University, P.R. China)

16:30 A Three-Phase Smart Inverter for Frequency and Voltage Regulation in an Unbalanced Distribution System
Jian-Tang Liao, Hong-Tzer Yang and Wen-Yao Huang (National Cheng Kung University, Taiwan)

16:45 Modeling and Control of Central Air Conditioning Loads for Peak Shaving
Dingyi Cheng and Wen Zhang (Shandong University, P.R. China); Meng Liu (State Grid Shandong Electric Power Research Institute, P.R. China)

17:00 Estimation of Load Margin by Machine Learning Based on Synchrophasor Data
Ansaya Treeworawet, Achara Pichetjamroen and Sanchai Dechanupaprittha (Kasetsart University, Thailand)

17:15 Comparative Analysis of Commonly Used Batteries for Residential Solar PV Applications
Shama N. Islam, Sajeeb Saha, Enamul Haque and Md Apel Mahmud (Deakin University, Australia)

D2_TS26: Power Quality, Protection and Electromagnetic Compatibility_4
Room: room_7505

16:00 A Low-Frequency Coordinated Control Method for Tokamak Hybrid Active Power Filter
Jing Lu, Li Jun and Huafeng Mao (Institute of Plasma Physics, Chinese Academy of Sciences, P.R. China); Zhiwei Mao (Institute of Plasma Physics, Chinese Academy of Sciences, P.R. China); Yanan Wu (Institute of Plasma Physics, Chinese Academy of Sciences, P.R. China); Xianshun Shen and Yunxiang Tian (Institute of Plasma Physics, Chinese Academy of Sciences, P.R. China)

16:15 A Quantitative Estimation of Power Quality Health Index for Power Substation
Thanapong Buranarattanavijit and Ekachai Phaisangittisagul (Kasetsart University, Thailand)

16:30 Total Harmonic Distortion (THD) Estimation Technique Based on Power Concept for Smart Power Meters
Lei Wang, Chi-Seng Lam and Man-Chung Wong (University of Macau, Macao)

16:45 The Study of Shunt Hybrid Active Power Filter Compensation Range Under Unbalanced Load
Ying Pang (University of Macau, P.R. China); Zeng Xiang and Man-Chung Wong (University of Macau, Macao)

17:00 Differential Impedance Angle Based Fault Detection in Microgrid
Nikhil Kumar Sharma (Indian Institute of Technology, Bhubaneswar, India, India); Subhransu Samantaray (Indian Institute of Technology, Bhubaneswar, India)

17:15 Fault Detection in HVDC Transmission Line by S-Transform Technique
Kundan Singh and Abhisek Ukil (University of Auckland, New Zealand)

D2_TS27: Electrical Machines & Drives

Room: room_7201B

16:00 Power Efficiency Analysis of a Three-phase Inverter for a BLDC Motor Drive with Varying Speeds and Load Torques
YongKeun Lee (Seoul National University of Science and Technology, Korea)

16:15 Evaluation of a Modular Stator, Segmented Rotor Switched Reluctance Motor
Ramon Florentino L. Santos (University of the Philippines Diliman, Philippines); Lew Andrew Tria (University of the Philippines - Diliman, Philippines)

16:30 Detection of Interturn Short-Circuit Fault and Demagnetization Fault in IPMSM by 1-D Convolutional Neural Network
Hojin Lee and Hyeun Jeong (Pohang University of Science and Technology (POSTECH), Korea); Sang Woo Kim (POSTECH, Korea)

16:45 An Improved 3-Step Startup Method Based on Sensorless Vector Control of PMSM
Lei Wang, Yifan Zhang, Linhai Zhao and Guozhu Chen (Zhejiang University, P.R. China)

17:00 A Design Method for LCC Resonant Converter over Wide Load Range with Wide-range Input and Output
Zhengu Li, Jun Zhao and Zheng Chen (School of Electrical Engineering, Zhejiang University, P.R. China); Guozhu Chen (Zhejiang University, P.R. China)

D2_TS28: Power Transmission and Distribution_4

Room: room_7301A
16:00 Study on the Calculation and Suppression Method of Metal Sheath Circulating Current of Three-phase Single-core Cable
Wei Liang and Zhicheng Zhou (Jiangsu Electric Power Research Institute Co. Ltd, P.R. China); Wenxia Pan and Ye Li (HoHai University, P.R. China); Qi Zhou and Mengzhou Zhu (Jiangsu Electric Power Research Institute Co. Ltd, P.R. China)

16:15 Validation of Power Transformer Wideband Modeling Using Standard sFRA Method with VNA Equipment
Filip Grecki (ABB Corporate Research, Switzerland); Bernhard Wunsch (ABB Switzerland Ltd, Switzerland)

16:30 Application of Soft Open Point for Flexible Interconnection of Urban Distribution Network
Qilin Hou, Jian Zheng and Ningyi Dai (University of Macau, Macao)

16:45 Application of Fiber Optic Sensor Systems for Acoustic and Optical Monitoring of Transmission Systems and Switchgear
Thomas Gräf, Matthias Menge, Moritz Kölling, Tamara Meinl and Vladimir Platonov (HTW Berlin, Germany)

17:00 Life-Cycle Cost Analysis of Submarine Cable to Island Power Systems
Apirat Jamnian, Komsan Hongesombut and Dulpichet Rerkpreedapong (Kasetsart University, Thailand)
Wednesday, December 4

Wednesday, December 4 9:00 - 10:30

D3_TS29: Power and Energy Engineering Planning, Management and Control

Room: room_7405

9:00 Energy Efficiency in Production Machines Through Harmonic Distortion Reduction
Shu Ju (Friedrich-Alexander University Erlangen-Nürnberg, Germany); Nico Hanenkamp (Friedrich-Alexander University Erlangen–Nürnberg, Germany)

9:15 Modeling of the CPS1 for the Frequency Constrained Unit Commitment
Hsin-Wei Chiu and Yu-Lin Lin (National Cheng Kung University, Taiwan); Le-Ren Chang-Chien (National Cheng-Kung University, Taiwan); Chin-Chung Wu (Taiwan Power Company, Taiwan)

9:30 Weekly Peak Load Forecasting for 104 Weeks Using Deep Learning Algorithm
Bo-Sung Kwon (Soongsil University & Electrical Engineering, Korea); Rae-Jun Park and Kyung-Bin Song (Soongsil University, Korea)

9:45 Research on Power Transaction Information Security of Microgrid Blockchain Network
Yujia Yang, Bin Duan and Xiangxiang Xiao (Xiangtan University, P.R. China)

10:00 Optimal Placement of Unified Power Flow Controller in Power System Through Salp Swarm Optimization
Stita Pragnya Dash (National Institute of Technology, Rourkela, India); Konidala Subhashini (National Institute Of Technology, India); J. Satapathy (NIT, Rourkela, India)

10:15 Data-driven Analytics for Effective Energy Management and Audits of Large Enterprise
Leoni Elizabeth Bule and Russell Baillie (The University of Auckland, New Zealand); Alan Tanton (CESI, France)

D3_TS30: Power Engineering Education and Power System Resilience

Room: room_7301A

9:00 Research and Application of Human-computer Intelligence for Wind and Electric Maintenance Based on CPS
Li Tao (University of XiangTan, P.R. China); Bin Duan, Yueping Chen and Xinyu Luo (Xiangtan University, P.R. China)

9:15 Geo-Spatial Modeling for High Voltage Underground Cables to Improve Resilience
Ebad Ur Rehman and Nirmal Nair (University of Auckland, New Zealand)

9:30 Multisource Energy System Reliability Including an Energy Storage System
Ricardo Gimenes (University of Sao Paulo & Electrical Engineering, Brazil); Miguel E. M. Udaeta and André Gimenes (GEPEA/EPUSP, Brazil); Victor Baiochi Riboldi (CPFL, Brazil); Tuo Ji and Xinjian Chen (CPFL Energia, Brazil)
9:45 Research on Cognitive Diagnosis System Based on Production and Education Integration in Wind Power Operation and Maintenance
Yueping Chen (Xiangtan University, P.R. China)

10:00 Experience in Asset Performance Management Analytics for Decision Support on Transmission & Distribution Assets
Ravinder Singh Negi (GE Power Services Malaysia Sdn Bhd, Malaysia)

**D3_TS31: Power Generation**

Room: room_7201B

9:00 Using a Small-Scale Generator to Evaluate Automatic Voltage Regulator of a 25 MVA Power Plant
Seyyed Majid Shariatzadeh (Electrical & Mechanical & IWPCO, Iran); Mohammad Ali Talebi (Iran Water & Power Resources Development Co., Iran); Ali Keshavarzian (University of Tehran & School of Electrical and Computer Engineering, Iran)

9:15 CTProfiler Measurement Method for Natural Draft Cooling Towers
Matej Sečnik (University of Ljubljana, Slovenia); Brane Širok and Marko Hočevar (University of Ljubljana, Faculty of Mechanical Engineering, Slovenia); Tomasz Barszcz (AMC TECH Sp. z o. o., Poland); Jure Smrekar (JS Energy Ltd., Slovenia)

9:30 Research on SOFC for Renewable Energy Interconnection for Stabilization of Power Fluctuation
Satoshi Niinuma (Kitami Institute of Technology, Japan)

9:45 Research on Analysis Method of Transient Reactive Characteristics of New-Generation Synchronous Condensers Considering Excitation Regulation
Fan Xiao (Hubei Electric Power Research Institute, P.R. China)

**D3_TS32: Power Quality, Protection and Electromagnetic Compatibility_5**

Room: room_7301B

9:00 A Hybrid Power Quality Conditioner (HPQC) with Reduced DC-Link Voltage Rating for Microgrid Applications
Zeng Xiang (University of Macau, Macao); Ying Pang (University of Macau, P.R. China); Man-Chung Wong and Lei Wang (University of Macau, Macao)

9:15 Comparison Between PSCAD and RTDS Hardware In-the-Loop Simulations System in Power Quality
Ying Pang (University of Macau, P.R. China); Zeng Xiang and Man-Chung Wong (University of Macau, Macao)

9:30 Dynamic Voltage Stability Improvement of Islanded Microgrid by Smart PV Inverter
Nadia Afrin, Fuwen Yang and Junwei Lu (Griffith University, Australia)

9:45 Deep Neural Network-based Wide Area Back-up Protection Scheme for Transmission System
Biswajit Sahoo and Subhransu Samantaray (Indian Institute of Technology, Bhubaneswar, India)

10:00 High Impedance Fault Characterization on Microsynchrophasor Measurements
Lady Joelle Dela Torres (University of the Philippines Diliman, Philippines); Michael Angelo Pedrada (University of the Philippines, Philippines)
D3_TS33: Renewable & Sustainable Energy_6

Room: room_7504

9:00 Identification of Solar PV Array Partial Shading Patterns Using Machine Learning
Nicholas Gabriel T. Ramirez and Erees Queen Macabebe (Ateneo de Manila University, Philippines)

9:15 Hybrid Particle Swarm Optimization and Gravitational Search Algorithm for Optimal Sizing of Hybrid Renewable Energy Systems
Ronan Cadmiel C. Castro (Bulacan State University, Philippines)

9:30 Two-stage Photovoltaic Power Forecasting Based on Extreme Learning Machine and Improved Pointwise Mutual Information
Zhengrong Chen (North China Electric Power University, P.R. China); Yang Hu (North China Electric China University, P.R. China)

9:45 Improved Finite Set Model Predictive Current Control of Grid Side Converter in Weak Grid Using Kalman Filter
Liang Chen, Yunyang Xu and Heng Nian (Zhejiang University, P.R. China)

D3_TS34: Renewable & Sustainable Energy_7

Room: room_7505

9:00 Integration of Rooftop Solar PV Generation with Wireless Power Transfer
Aratrika Ghosh, Abhisek Ukil and Aiguo Patrick Hu (University of Auckland, New Zealand)

9:15 Position Dependent Impact of Plasmonic Nanocubes on the Optical Performance of Perovskite Solar Cells: A Simulation
Md. Sazzadur Rahman (University of Asia Pacific & Bangladesh University of Engineering and Technology (BUET), Bangladesh); Mohammad Ibrahim (University of Asia Pacific, Bangladesh)

9:30 Wind Energy Integration Using Hybrid Energy Storage System in East Nusa Tenggara, Indonesia
Hizkia Bontong, Abhisek Ukil and Xibeng Zhang (University of Auckland, New Zealand)

Wednesday, December 4 11:00 - 12:30

D3_TS35: Power and Energy Engineering Planning, Management and Control_6

Room: room_7405

11:00 Interference Rejection of High Voltage Cables Partial Discharge Detection Based on Combination Features Analysis
Yijiang Wu and Ganjun Wang (Zhongshan Power Supply Bureau of the Guangdong Power Grid Corporation, P.R. China); Jing Bi (Zhongshan Power Supply Bureau of the Guangdong Power Grid Corporation, P.R. China); Jinshu Li, Xiaosheng Peng and Taiwei Liu (Huazhong University of Science and Technology, P.R. China)

11:15 A Novel Type of Single-Ended Wireless V2H System with a Supply Voltage Control and a Capacitor Selector Scheme
Aoto Yamamoto and Hideki Omori (Osaka Institute of Technology, Japan); Masahito Tsuno (Nichicon Corporation, Japan); Noriyuki Kimura and Toshimitsu Morizane (Osaka Institute of Technology, Japan)

11:30 A Novel On-line Monitoring System for High Voltage Cable Dielectric Loss Detection
Yuzhu Chen (Huazhong University of Science and Technology, P.R. China); Xiaosheng Peng (Huazhong University of Science and Technology, P.R. China); Hao Zhou and Xiaochuan Shi (Wuhan Fujaanda Electrical Technology Co., Ltd, P.R. China)

11:45 Quality Evaluation Method for Coordination of Power Grid Development Considering Diversity of Generation-Demand Pattern
Ming He, Xiaopeng Li, Shilong Li, Rongsen Luo and Xiangxi Duan (Chengdu, P.R. China); Hang Yin and Youbo Liu (Sichuan University, P.R. China)

12:00 Quotation Model of Energy Storage Participating in Electric Power Day-Ahead Market Based on Deep Learning Surrogate Model
Xinhe Chen (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China); Wei Pei (Institute of Electronic Engineering, Chinese Academy of Sciences, P.R. China); Wei Deng (Institute of Electrical Engineering, Chinese Academy of Sciences, P.R. China)

D3_TS36: Special Topic

Room: room_7404

11:00 Plasmon Enhanced Semitransparent Planar Perovskite Solar Cells with Copper Nanocubes: FDTD Study
Md. Sazzadur Rahman (University of Asia Pacific & Bangladesh University of Engineering and Technology (BUET), Bangladesh); Mohammad Ibrahim, Sirajam Munira and Kowshik Paul Mithun (University of Asia Pacific, Bangladesh)

11:15 Distribution Network Operation and Maintenance Simulation System Based on Cloud Platform
Rongjian Cui and Hui Hou (Wuhan University of Technology, P.R. China); Jinyuan Zeng (School of Automation Wuhan University of Technology, P.R. China); Jinrui Tang (Wuhan University of Technology, P.R. China); Xixiu Wu and Peng Liu (School of Automation Wuhan University of Technology, P.R. China)

11:30 Experiment and Simulation of the Accuracy of Current Transformer with a New Core Material
Bing Lu and Xu Wang (China Electric Power Research Institute, P.R. China); Xing Chen (State Grid Qinghai Electric Power Research Institute, P.R. China); Can Ding (China Three Gorges University, P.R. China)

11:45 Distribution Network Project Portfolio Optimization Decision Model Based on Power Demand Matching
Wei Wu, Meng Li and Tongyu Yan (Economic and Technology Research Institute of State Grid Fujian Electric Power Company, P.R. China); Pingfa Huang (State Grid Xintong Yili Technology Co., Ltd, P.R. China); Xin Lu (State Grid Info-Telecom Great Power Science and Technology Co., Ltd, P.R. China); ZeQI Wang (Sichuan University, P.R. China)

12:00 A New Gravity Energy Storage Operation Mode to Accommodate Renewable Energy
Yangyang Chen and Hui Hou (Wuhan University of Technology, P.R. China); Tao Xu, Xixiu Wu and Peng Liu (School of Automation Wuhan University of Technology, P.R. China); Huan Wang (China Electric Power Research Institute, P.R. China)

D3_TS37: Smart Grid Technologies and Utility Applications_5
Room: room_7505

11:00 A Prediction Method for Power Transformer State Parameters Based on Feature Attention Mechanism
Yu Cui and Huijuan Hou (Shanghai Jiao Tong University, P.R. China); Min He and Guozhen Jiang (Jiande Power Supply Company, P.R. China); Gehao Sheng (Shanghai Jiao Tong University, P.R. China); Xiuchen Jiang (Shanghai Jiao Tong University, P.R. China)

11:15 Vanadium Redox & Lithium Ion Based Multi-Battery Hybrid Energy Storage System for Microgrid
Oluwatobiloba Adeleke (University of Southampton, United Kingdom (Great Britain)); Abhisek Ukil and Xibeng Zhang (University of Auckland, New Zealand)

11:30 A Novel Privacy Protection Framework for Power Generation Data Based on Generative Adversarial Networks
Xinyao Feng (Information Center, Guangdong Power Grid Company Limited, P.R. China); Jian Lan (Tsinghua University, P.R. China); Zewu Peng and Zhisheng Huang (Information Center, Guangdong Power Grid Company Limited, P.R. China); Qinglai Guo (Tsinghua University, P.R. China)

D3_TS38: Renewable & Sustainable Energy_8

Room: room_7504

11:00 Short-Term Forecasting of Photovoltaic Power Integrating Multi-Temporal Meteorological Satellite Imagery in Deep Neural Network
Hunsoo Song, Gwangjoong Kim, Minho Kim and Yongil Kim (Seoul National University, Korea)

11:15 An Effective Dynamic Equivalent Model of Wind Farm Connected to Power System Network
Akhilesh Gupta and Abheejeet Mohapatra (Indian Institute of Technology Kanpur, India); S n Singh (IIT Kanpur, India)

11:30 Post-Fault Operation Scenerio in a Wind Integrated Microgrid: Voltage Recovery Issue and Solution
Shaila Arif, Ata E Rabbi and Tareq Aziz (Ahsanullah University of Science and Technology, Bangladesh)

11:45 Hydropower Energy Recovery from Wastewater Treatment Plant: Case of Zeekoegat Plant
Kanzumba Kusakana (Central University of Technology, South Africa)