

# 2018 IEEE CEIDP IEEE CONFERENCE ON ELECTRICAL INSULATION AND DIELECTRIC PHENOMENA



October 21-24, 2018

IBEROSTAR Hotel & Resort Cancun  
Boulevard Kukulcan Km. 17, Cancun Q. Roo MX 77500

## CONFERENCE PROGRAM



# IEEE CEIDP 2018 PROGRAM

REGISTRATION – Sunday 12:30-20:00  
 Monday 07:30-18:00  
 Tuesday 07:30-12.30  
 Wednesday 07:30-12.30

SESSIONS – Oral sessions in Foyer Miramar Poster sessions in Isla 1-4

	Sunday, Oct 21	Monday, Oct 22	Tuesday, Oct 23	Wednesday, Oct 24
08:00		Conference Welcome and Whitehead Lecture	Session 5 (Oral) Outdoor insulation, Surface Flashover and GIS	Session 7 (Oral) Partial Discharge and Measurement Techniques
08:30				
09:00	Tutorial (9:00-17:00):	Break		
09:30	Optimization and Sensitivity			
10:00	Analysis	Session 1 (Oral) Polarization and Charge Characteristics	Break	Break
10:30				
11:00	Workshop (9:00-13:00):		Session 6 (Poster) 6A – Aging and Treeing 6B – High Field Effects and Field Mapping	Session 8 (Poster) 8A – Partial Discharge 8B – Pre-breakdown and Breakdown
11:30	Nanodielectrics			
12:00				
12:30		Lunch	Cultural Tour	Lunch
13:00	CEIDP Board Meeting		DEIS AdCom Meeting	
13:30	(12:30-17:00)			
14:00		Session 2 (Oral) Advanced Materials		Session 9 (oral) Aging, Pre-breakdown and Breakdown Phenomena
14:30				
15:00				
15:30		Break		
16:00				Conference Closing
16:30		Session 3 (Poster) 3A – Polarization, Charge Storage and Transport; 3B – Nanocomposites; 3C – Biodielectrics		
17:00				
17:30				
18:00	Welcome Reception		Banquet	
18:30		Dinner		
19:00				
19:30		Session 4 (Poster) 4A – Outdoor Insulation and Surface Flashover 4B – Measurement Techniques		
20:00				
20:30				
21:00				

## Sunday, October 21, 2018

### 9:00-13:00 Workshop: Nanodielectrics

### 9:00-17:00 Tutorial: Optimization and Sensitivity Analysis

### 12:30-17:00 CEIDP Board Meeting

### 12:30-20:00 Registration

### 18:00-19:30 Welcome Reception

## Monday, October 22, 2018

### 8:00-8:15 Welcome

Nicola Bowler, Iowa State University, USA

### 8:15-9:30 Whitehead Lecture

**Dielectric Relaxation and Ferroelectric Imprint**  
Herbert Kliem, Saarland University, Germany

### 9:30-10:00 Break

### 10:00-12:20 Session 1 (Oral) Polarization and Charge Characteristics

Chair: Cristian Laurent, University de Toulouse, France  
Co-chair: Thomas Andritsch, Uni. of Southampton, UK

- 1-1 Effect of Plasma Surface Modifications on Low- and High-Field Properties of P(VDF-TrFE)  
Vecchio, Michael Anthony<sup>1</sup>; Meddeb, Amira Barhoumi<sup>2</sup>; Lanagan, Michael T.3; Ounaies, Zoubeida<sup>2</sup>; Shallenberger, Jeff<sup>4</sup>; 1: Penn State University, Materials Science and Engineering Department, USA; 2: Penn State University, Nuclear and Mechanical Engineering Department, USA; 3: Penn State University, Engineering Science and Mechanics Department, USA; 4: Penn State University, Materials Research Institute, USA (1160)
- 1-2 Piezoelectric Nanofibers for Integration in Multifunctional Materials  
Fabiani, Davide<sup>1</sup>; Grolli, Filippo<sup>1</sup>; Speranza, Marco<sup>2</sup>; Suraci, Simone<sup>1</sup>; Brugo, Tommaso<sup>2</sup>; Maccaferri, Emanuele<sup>3</sup>; Zucchelli, Andrea<sup>2</sup>; 1: DEI - University of Bologna, Italy; 2: DIN - University of Bologna, Italy; 3: DIC - University of Bologna, Italy (1382)
- 1-3 Permittivity Calculation Model for Low Permittivity Characteristic of Epoxy/Hollow Silica Nanocomposites  
Kurimoto, Muneaki<sup>1</sup>; Yoshida, Takuma<sup>1</sup>; Kato, Chiharu<sup>1</sup>; Kato, Takeyoshi<sup>1</sup>; Suzuoki, Yasuo<sup>2</sup>; 1: Nagoya University, Japan; 2: Aichi Institute of University (1356)
- 1-4 Low Frequency Dielectric Response of Silicone/ZrO<sub>2</sub> Nanocomposites (1333)  
Li, Shaohua<sup>1</sup>; Liang, Xidong<sup>1</sup>; Prasad, Aditya<sup>2</sup>; Nelson, J. Keith<sup>2</sup>; Schadler, Linda S.<sup>2</sup>; Gao, Yanfeng<sup>3</sup>; 1: Dept. of Electrical Engineering, Tsinghua University, China; 2: Dept. of Materials Science and Engineering, Rensselaer Polytechnic Institute, USA; 3: State Grid Jibei Electric Power Co. Ltd. Research Institute, North China Electric Power Research Institute Co. Ltd, China
- 1-5 From Polyethylene to Polystyrene: First Principles

Prediction of temperature and field dependent carrier mobility (1198)

Sato, Masahiro; Kumada, Akiko; Hidaka, Kunihiko; The University of Tokyo, Japan

1-6 Measurement of Carrier Mobility in Polyethylene Based on the Pulsed Electro-Acoustic Method

Su, Rui; Wu, Kai; Cheng, Chuanhui; Wu, Yang; Xi'an Jiaotong University, China (1209)

1-7 Space Charge Analysis of Multi-Structure Polyimide Films using TSM

Akram, Shakeel<sup>1</sup>; Castellon, Jérôme<sup>1</sup>; Agnel, Serge<sup>1</sup>; Khan, M. Zeeshan<sup>2</sup>; 1: University of Montpellier, France; 2: Chongqing University, China (1109)

### 12:20-14:00 Lunch

### 14:00-16:00 Session 2 (Oral): Advanced Materials

Chair: Eric David, ETS, Canada

Co-chair: Jinliang He, Tsinghua University, China

- 2-1 Organometallic-Organic Hybrid System as Flexible Dielectric Material  
Nasreen, Shamima<sup>1,2</sup>; Tefferi, Mattewos<sup>2</sup>; Baczkowski, Matthew<sup>1</sup>; Sotzing, Gregory<sup>1</sup>; Cao, Yang<sup>2,3</sup>; 1: Department of Chemistry, University of Connecticut, USA; 2: Institute of Materials Science, University of Connecticut, USA; 3: Department of Electrical and Computer Engineering, University of Connecticut, USA (1137)
- 2-2 Interfacial Compatibility on Dielectric Properties of PolypropylenePolyhedral Oligomeric Silsesquioxane Composite  
Xie, Dongri; Liu, Wenfeng; Wu, Kangning; Min, Daomin; Li, Shengtao; Xi'an Jiaotong University, China(1201)
- 2-3 The Correlation and Balance of Critical Material Properties for DC Cable Dielectrics  
Tefferi, Mattewos<sup>1</sup>; Li, Zongze<sup>1</sup>; Uehara, Hiroaki<sup>2</sup>; Cao, Yang<sup>1</sup>; 1: University of Connecticut, United States of America; 2: Kanto Gakuin University, Japan (1255)
- 2-4 Surface Charge Properties of SiR/SiC Composites in DC and Pulse Combined Field  
Yang, Zhuoran; Du, Boxue; Li, Zhonglei; Tianjin University, China (1269)
- 2-5 Effect of the Non-linear Rlectric Conductivity of Mineral Insulating Oil on the Dielectric Strength at High DC Voltage Stress  
Gabler, Tobias<sup>1</sup>; Backhaus, Karsten<sup>1</sup>; Götz, Thomas<sup>1</sup>; Fritsche, Ronny<sup>2</sup>; Großmann, Steffen<sup>1</sup>; 1: Technische Universität Dresden, Germany; 2: SIEMENS AG, Nuremberg, Germany (1128)
- 2-6 Electrical Characterization of Dibenzyltoluene Liquid at High Temperatures up to 300°C  
MUSLIM, Joko<sup>1,2</sup>; LESAINT, Olivier<sup>1</sup>; HANNA, Rachelle<sup>1</sup>; REBOUD, Jean-Luc<sup>1</sup>; SINISUKA, Ngapuli Irmea<sup>3</sup>; 1: Univ. Grenoble Alpes, CNRS, Grenoble INP, Laboratoire de génie électrique - G2Elab, France; 2: PLN Indonesia; 3: Institut Teknologi Bandung (ITB), Indonesia (1260)

### 16:00-16:30 Break

### 16:30-18:30 Session 3 (Poster)

Chair: Giovanni Mazzanti, University of Bologna, Italy

### Session 3A – Polarization, Charge Storage and Transport

3A-1 Electric Response and Thermal Properties of Ethylene Vinyl Acetate/Graphene-based Composite

- Azizi, Sohrab<sup>1</sup>; Ouellet-Plamondon, Claudiane<sup>1</sup>; David, Eric<sup>1</sup>; Fréchette, Michel<sup>2</sup>; 1: *École de technologie supérieure, Canada*; 2: *Xi'an Jiaotong University, China* (1106)
- 3A-2 Electrical field-strength dependent space charge and charge decay characteristics at silicone rubber / silicone grease interfaces  
Spelzhausen, Simon; Ionian, Mario-Rafael; Plath, Ronald; TU-Berlin, Germany (1161)
- 3A-3 Dielectric Frequency Measurement of Semiconductive Layers in XLPE Cables  
Maier, T.; Leibfried, T.; Schmehl, K.; KIT-IEH, Germany (1173)
- 3A-4 Influence of Ion Species in Electrolyte on Capacitance of EDLC  
Matsubara, Shinji; Murakami, Yuichi; Muramoto, Yuji; Meijo University, Japan (1188)
- 3A-5 Relative Permittivity of TiO<sub>2</sub>/Silicone Elastomer Composite Stretched in Uniaxial Direction  
Naya, Kento<sup>1</sup>; Kurimoto, Muneaki<sup>1</sup>; Kato, Takeyoshi<sup>1</sup>; Yasuo, Suzuoki<sup>2</sup>; 1: *Nagoya University, Japan*; 2: *Aichi Institute of University, Japan* (1254)
- 3A-6 Modeling the effect of particles electrostatic interaction on the dielectric response of BT/PVDF composites  
Zhong, Shao-Long<sup>1</sup>; Dang, Zhi-Min<sup>1</sup>; Wang, Si-Jiao<sup>1</sup>; Zha, Jun-Wei<sup>2</sup>; 1: *Department of Electrical Engineering, Tsinghua University, China*; 2: *College of Biological and Chemistry Engineering, University of Science & Technology Beijing, China* (1262)
- 3A-7 Time-Dependent Electric Field Distribution during Load Cycle Test for HVDC MI Cable  
Kwon, Ik-Soo; Kim, Sun-Jin; Koo, Jae-Hong; Lee, Bang-Wook; Hanyang University, Korea (1277)
- 3A-8 Arrangement Strategy of Particle Trap in DC GIL  
Wang, Jian; Wang, Jingrui; Ni, Xiaoru; Chang, Yanan; North China Electric Power University, China (1124)
- 3A-9 Role of Holes in Conduction Phenomenon of Low Density Polyethylene at High Fields and Temperatures  
Upadhyay, Avnish Kumar; Reddy, Chandupatla Chakradhar; IIT Ropar, India (1202)
- 3A-10 Influence of Crosslinking Byproducts on DC Conductivity of HVDC XLPE Cable Insulation  
Ren, Haiyang; Zhong, Lisheng; Zhao, Wei; Liu, Minghao; Yang, Xiaoyu; Li, Yinge; Yu, Qinxue; Cao, Liang; Xi'an Jiaotong University, China (1311)
- 3A-11 Excited States Analysis of Polyethylene Molecule with Carbonyl Defects Based on Time-dependent Density Functional Theory  
Pu, Lu<sup>1</sup>; Chen, Xi<sup>2</sup>; Zhu, Lei<sup>3</sup>; Zhao, Xuefeng<sup>1</sup>; Liu, Jian<sup>1</sup>; Zheng, Jiankang<sup>4</sup>; Wang, Yanbo<sup>2</sup>; Zhao, Aixuan<sup>2</sup>; Deng, Junbo<sup>2</sup>; Zhang, Guanjun<sup>2</sup>; 1: *Research Institute of State Grid Shaanxi Electric Power Company, China*; 2: *State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, China*; 3: *State Grid Weinan Power Supply Company, China*; 4: *State Grid Xi'an Electric Power Supply Company, China* (1344)
- 3A-12 Ferroelectrets Filled with High Breakdown-Strength Gas  
Joysey, William D.; Mellinger, Axel; Central Michigan University, USA (1387)
- 3A-13 Improving the charge/discharge efficiency and dielectric breakdown in high temperature polymer dielectrics  
Chen, Xin; Zhang, Tian; Zhang, Qiming; Penn State University, USA (1379)
- 3A-14 Interpretation of PEA Output Signal in a Multilayer Specimen  
Andrade, Marcelo De Araujo<sup>1</sup>; Candela, Roberto<sup>1</sup>; De Rai, Luca<sup>1</sup>; Franchi Bononi, Stefano<sup>1</sup>; Imburgia, Antonino<sup>2</sup>; Riva Sanseverino, Eleonora<sup>2</sup>; Romano, Pietro<sup>2</sup>; Viola, Fabio<sup>2</sup>; 1: *Prysmian Group, Milan, Italy*; 2: *University of Palermo, Italy* (1281)
- 3A-15 Characteristics of Space Charge Accumulation in Polypropylene-Based Insulating Materials under DC Stress  
Kanai, Takehiro; Miyake, Hiroaki; Tanaka, Yasuhiro; Tokyo City University, Japan (1343)
- 3A-16 Influence of moisture absorption on space charge behavior of thermosetting resin  
Konishi, Soichiro; Kohuji, Ryohei; Miyake, Hiroaki; Tanaka, Yasuhiro; Tokyo City University, Japan (1280)
- 3A-17 Space charge behavior and electrical breakdown strength of XLPE film sandwiched between semiconducting layers  
Ogura, Kotaro; Kasuga, Hiroki; Miyake, Hiroaki; Tanaka, Yasuhiro; Tokyo City University, Japan (1298)
- Session 3B – Nanocomposites**
- 3B-1 Mica Insulating Tape for Large Generators with High Thermal Conductivity  
Takahashi, Ryoh; Takezawa, Yoshitaka; Fukushima, Keiji; Saito, Koichi; Hitachi Chemical Co., Ltd., Japan (1101)
- 3B-2 Electro-mechanical and chemical strength analysis of thermally aged nanofluid impregnated kraft paper  
Maharana, Mrutyunjay<sup>1</sup>; Baruah, Niharika<sup>2</sup>; Nayak, Sisir Kuma<sup>2</sup>; Sahoo, Niranjan<sup>3</sup>; 1: *Centre for Energy, Indian Institute of Technology Guwahati, India*; 2: *Department of Electronics and Electrical Engineering, Indian Institute of Technology Guwahati, India*; 3: *Department of Mechanical Engineering, Indian Institute of Technology Guwahati, India* (1120)
- 3B-3 Breakdown characteristics of C<sub>60</sub> modified transformer oil  
Sima, Wenxia; Chen, Jiaqi; Sun, Potao; Zhang, Huangjing; Ye, Lian; He, Jiahui; Yin, Ze; Shao, Qianqiu; Chongqing University, China (1126)
- 3B-4 Study on Space Charge Accumulation Characteristics of LDPE/TiO<sub>2</sub> Nanocomposites under Thermal Aging  
Wang, Youyuan; Li, Yudong; Zhang, Zhanxi; Chongqing University, China (1141)
- 3B-5 Improvement of Space Charge Behaviors of PP/ULDPE Blends by Nano Graphene for HVDC Cable  
Hou, Zhaohao<sup>1</sup>; Du, Boxue<sup>1</sup>; Li, Jin<sup>1</sup>; Li, Zhonglei<sup>1</sup>; Han, Chenlei<sup>1</sup>; Xu, Ranran<sup>1</sup>; Wang, Mingyang<sup>1</sup>; Fu, Mingli<sup>2</sup>; Hou, Shuaif<sup>2</sup>; Hui, Baojun<sup>2</sup>; 1: *Tianjin University, China*; 2: *Electric Power Research Institute Co. Ltd. of CSG, China* (1200)
- 3B-6 Effects of nanoparticle size on dielectric properties of transformer oil  
Ge, Yang; Niu, Mingkang; Wang, Lei; Huang, Meng; Lv, Yuzhen; Li, Chengrong; North China Electric Power University, China (1213)
- 3B-7 The dielectric properties of PP nanocomposites doped with mesoporous silica nanoparticles  
Yang, Yang; Li, Qi; He, Jinliang; Tsinghua University, China (1221)
- 3B-8 New self-crosslinked acrylic-based dielectric elastomers for actuator with high performance at low electric field  
Zhao, Yu<sup>1</sup>; Zha, Junwei<sup>1,2</sup>; Zhong, Shaolong<sup>2</sup>; Wang, Si-Jiao<sup>2</sup>; Dang, Zhi-Min<sup>1</sup>; 1: *University of Science and Technology Beijing, China*; 2: *Tsinghua University, China* (1267)
- 3B-9 Space Charge Characteristics of CB/LDPE Composites

at Different Temperatures

Chen, Bingying<sup>1</sup>; Wu, Jie<sup>1</sup>; Yi, Chengqian<sup>1</sup>; Fan, Linzhen<sup>1</sup>; Tu, Youping<sup>1</sup>; Ding, Lijian<sup>2</sup>; Qin, Sichen<sup>1</sup>; 1: North China Electric Power University, China; 2: Hefei University Of Technology, China (1268)

3B-10 Conductivity Characteristics of CB/LDPE Composites at Different Temperatures

Chen, Bingying<sup>1</sup>; Wu, Jie<sup>1</sup>; Yi, Chengqian<sup>1</sup>; Fan, Linzhen<sup>1</sup>; Tu, Youping<sup>1</sup>; Ding, Lijian<sup>2</sup>; Qin, Sichen<sup>1</sup>; 1: North China Electric Power University, China; 2: Hefei University Of Technology, China (1301)

3B-11 Electrical ageing tests on nanofilled impregnation resins for Type I random wound windings

Guastavino, Francesco<sup>1</sup>; Ferraris, Mattia<sup>2</sup>; Gianelli, Walter<sup>2</sup>; Torello, Eugenia<sup>1</sup>; 1: University of Genova, Italy; 2: Elantas Europe S.r.l. (1324)

3B-12 Partial Discharge Erosion on Gamma-Ray Irradiated Epoxy/Al<sub>2</sub>O<sub>3</sub> Nanocomposites

Gao, Yu<sup>1,2</sup>; Wang, Xiaofang<sup>1</sup>; Wang, Jilong<sup>3</sup>; Xu, Bangbang<sup>1</sup>; Du, Boxue<sup>1</sup>; 1: Tianjin University, China; 2: University of Southampton, UK; 3: State Grid Tianjin Electric Power Company, China (1330)

3B-13 Variation of Current-Density as a Function of Electric-Field Intensity in Synthetic Nanoclay-filled Polypropylene

Hiziroglu, Huseyin Recai; Shkolnik, Iosif E.; Kettering University, USA (1355)

3B-14 Electric Field Relaxation Effect of Micro-varistor /epoxy Composite

Abe, Kazuma<sup>1</sup>; Harada, Shota<sup>1</sup>; Nakano, Yusuke<sup>1</sup>; Kozako, Masahiro<sup>1</sup>; Hikita, Masayuki<sup>1</sup>; Yamamoto, Takashi<sup>2</sup>; Okabe, Shigemitsu<sup>2</sup>; 1: Kyushu Institute of Technology, Japan; 2: Tokyo Electric Power Company Holdings, Inc, Japan (1360)

3B-15 Discharge Resistant Epoxy/Clay Nanocomposite for High Torque Density Electrical Propulsion

Nguyen, Hiep Hoang<sup>1</sup>; Ronzello, Joanne<sup>1</sup>; Cao, Yang<sup>1</sup>; Mirza, Arshiah<sup>1</sup>; Chen, Weiqiang<sup>1</sup>; Bazzi, Ali<sup>1</sup>; Chapman, Jack<sup>2</sup>; Nasreen, Shamima<sup>1</sup>; 1: University of Connecticut, USA; 2: Electric Boat, A General Dynamic Company, Groton, CT, USA (1365)

3B-16 Dielectric Properties of LLDPE/MgO Nanocomposites Micro-extruded from a Masterbatch

Couderc, Hugues<sup>1</sup>; Griseri, Virginie<sup>2</sup>; David, Eric<sup>1</sup>; Mary, Dominique<sup>2</sup>; 1: ETS, Canada; 2: Université Paul Sabatier, Laboratoire Laplace, France (1368)

3B-17 Micro-nanostructured silicone surfaces for high voltage application

Maghsoudi, Khosrow; Momen, Gelareh; Jafari, Reza; Farzaneh, Masoud; UQAC, Canada (1377)

3B-18 Discharge Resistant Nano-coatings

Xia, Jing<sup>1,2</sup>; Li, Zhengyu<sup>1,2,3</sup>; Nasreen, Shamima<sup>1,2</sup>; Ronzello, JoAnne<sup>1,2</sup>; Jacobs, Linda<sup>4</sup>; Cao, Yang<sup>1,2,3</sup>; 1: NSF Industrial University Collaborative Research Center on High Voltage/Temperature Materials and Structures; 2: Electrical Insulation Research Center, Institute of Materials Science, University of Connecticut; 3: Electrical and Computer Engineering, University of Connecticut; 4: GE Industrial Solutions (1300)

3B-19 Surface Sputtering ZnO and PTFE Film for Space Charge Suppression in Oil Impregnated Insulation Pressboard

Li, Yanqing; Hao, Jian; Liu, Cong; Liao, Ruijin; Yang, Lijun; Chongqing University, China (1314)

### Session 3C – Biodielectrics

3C-1 Relationship between Size of Leaked Nucleic Acid of Escherichia coli and Survival ratio by High Electric Field Pulse Application

Sato, Takunao; Yamashita, Ryo; Yoshikawa, Daiki; Murakami, Yuichi; Muramoto, Yuji; Meijo University, Japan (1182)

3C-2 Development of Selective Sterilization System of Bacteria in Aqueous Solution by High Electric Field Pulse Application

Murakami, Yuichi; Sato, Takunao; Muramoto, Yuji; Meijo University, Japan

### 18:30-19:30 Dinner

### 19:30-21:30 Session 4 (Poster)

Chair: Refat Ghunem, National Research Council, Canada

### Session 4A – Outdoor Insulation and Surface Flashover

4A-1 Study on Electrical Field Distortion Effect by Linear Defects of Tri-post Insulator

Wu, Zehua<sup>1</sup>; Wang, Haoran<sup>1,2</sup>; Tian, Huidong<sup>1</sup>; Cui, Boyuan<sup>2</sup>; Zhou, Shiyi<sup>1</sup>; Peng, Zongren<sup>1</sup>; 1: Xi'an Jiaotong University, China; 2: China Electric Power Research Institute, China (1146)

4A-2 Electrical Power Dissipation on the Surface of a Ceramic Insulator Under Pollution Condition

Ilomuanya, Chibuike; Farokhi, Shahab; Nekahi, Azam; Glasgow Caledonian University, United Kingdom (1148)

4A-3 Effects of Suspension Pattern on Operation Reliability of Anti-Icing Polymer Insulators in HVAC Transmission Lines

Kong, Xianghuan<sup>1</sup>; Liu, Yong<sup>1</sup>; Li, Longji<sup>2</sup>; Du, Boxue<sup>1</sup>; 1: School of Electrical and Information Engineering, Tianjin University, China; 2: Electric Power Research Institute, State Grid Tianjin Electric Power Company, China (1165)

4A-4 The research of alternative EHV mineral transformer oils for the replacement of SHELL Diala Oil

Fu, Qiang; Peng, Lei; Lin, Musong; Lv, Wangyan; Zhao, Yaohong; Qian, Yihua; Guangdong Power Grid Co., Ltd., China (1166)

4A-5 Influence of VFTO Characteristics to Electric Field Distribution of Basin-type Insulator with Transient Method

Wu, Zehua<sup>1</sup>; Tian, Huidong<sup>1</sup>; Wang, Haoran<sup>1</sup>; Yang, X<sup>2</sup>; Zhou, Shiyi<sup>1</sup>; Zhang, Pengfei<sup>3</sup>; Peng, Zongren<sup>1</sup>; 1: Xi'an Jiaotong University, China; 2: Hefei University of Technology; 3: State Grid Corporation of China (1176)

4A-6 Dynamics of ion concentrations in air affected by applied dc electric field and humidity

Schiessling, Joachim<sup>1</sup>; Mikiver, Anders<sup>2</sup>; Serdyuk, Yuriu<sup>2</sup>; 1: ABB Corporate Reserach, Västerås, Sweden; 2: Chalmers University of Technology, Gothenborg, Sweden (1179)

4A-7 Water absorption of high-temperature vulcanized silicone rubber

Wang, Zhong<sup>1</sup>; Zhang, Wei<sup>2</sup>; Zhao, Lihua<sup>1</sup>; 1: Sichuan University, China; 2: State grid Hubei electric power company limited, China (1194)

4A-8 Electrolytic Corrosion Charge Monitoring on the Hardware of Porcelain and Glass Insulators on HVDC Overhead Lines

Yang, Daiming<sup>1</sup>; Mei, Hongwei<sup>1</sup>; Wang, Liming<sup>1</sup>; Guo, Chengjun<sup>2</sup>; 1: Graduate School at Shenzhen, Tsinghua University, China; 2: Electric Power Research Institute, Yunnan Power Grid Co. Ltd., China (1208)

4A-9 Grading the Potential Distribution of DC Cable Terminals

- Using Nonlinear Conductivity Material  
Zhao, Xiaolei; Yang, Xiao; Hu, Jun; Li, Qi; Tsinghua University, China (1222)
- 4A-10 Numerical Research on Heat Transfer Mechanism of Electrical Ceramic Materials in Pulsed Thermography Detection  
Guo, Chenjun<sup>1</sup>; Liu, Lishua<sup>2</sup>; Yu, Hong<sup>1</sup>; Ma, Yi<sup>1</sup>; Mei, Hongwei<sup>2</sup>; Wang, Liming<sup>2</sup>; 1: Electric Power Research Institute, Yunnan Power Grid Co., Ltd., China; 2: Graduate School at Shenzhen, Tsinghua University, China (1231)
- 4A-11 Research on the Influence of Charge Quantity of Particles on Contamination Accumulation Characteristics  
Liao, Yifan<sup>1,2</sup>; Li, Mingzhe<sup>3</sup>; Cao, Bin<sup>3</sup>; Mei, Hongwei<sup>3</sup>; Wang, Liming<sup>3</sup>; 1: Institute of Science and Technology of China Southern Power Grid, China; 2: School of Electric Power, South China University of Technology, China; 3: Graduate School at Shenzhen, Tsinghua University, China (1248)
- 4A-12 Influence of Plasma Jet Treatment on the Adhesion between the existing and re-applied RTV coating  
Zhang, Ruobing; Wang, Shanshan; Li, Shuang; Graduate School at Shenzhen, Tsinghua University, China (1251)
- 4A-13 Temperature Dependence of Nonlinear Conducting Behavior for Field Grading Materials  
Yang, Xiao; Zhao, Xiaolei; Li, Qi; Hu, Jun; Zhang, Bo; He, Jinliang; Tsinghua University, China (1253)
- 4A-14 Analysis Surface Flashover Characteristics of Epoxy Resin/BN Thermal Insulation Material  
Kan, Yuqiang<sup>1</sup>; Bian, Xingming<sup>2</sup>; 1: North China Electric Power University, Baoding, China; 2: North China Electric Power University, Beijing, China (1261)
- 4A-15 Influence of Aluminum Foil and External Conductor on the Temperature Distribution of RIP Condenser Converter Transformer Bushings  
Yang, Xi<sup>1</sup>; Wang, Qingyu<sup>2</sup>; Peng, zongren<sup>2</sup>; 1: Hefei university of technology, China; 2: Xi'an Jiaotong University, China (1270)
- 4A-16 Characteristic properties of High Consistency Rubber and Liquid Silicone Rubber  
Guo, Jingang<sup>1</sup>; Wang, Liming<sup>2</sup>; Wang, Yanwei<sup>1</sup>; Yin, Fanghui<sup>2</sup>; Liu, Tianqi<sup>1</sup>; Lin, Ying<sup>2</sup>; 1: State Grid East Inner Mongolia Electric Power Company Research Institute, China; 2: Graduate School at Shenzhen, Tsinghua University, Shenzhen, China (1273)
- 4A-17 Characteristics of Transient Sheath Overvoltage in 110kV Underground Cable Network  
Li, Jiaming<sup>1</sup>; Chen, Xi<sup>1</sup>; Xu, Long<sup>1</sup>; Zhao, Aixuan<sup>1</sup>; Liu, Jian<sup>2</sup>; Zhao, Xuefeng<sup>2</sup>; Deng, Junbo<sup>1</sup>; Zhang, Guanjun<sup>1</sup>; 1: Xi'an Jiaotong University, China; 2: Electric Power Research Institute of State Grid Shaanxi Electric Power Company, China (1282)
- 4A-18 Transient Electric Field Computation for GIS insulator Under Switching Impulse Voltage  
Yang, Xi<sup>1</sup>; Zhan, Xuha<sup>2</sup>; 1: Hefei university of technology, China; 2: State Grid Anhui Electric Power CO.,LTD., China (1285)
- 4A-19 Transient Electric Field Calculation of Zinc oxide arrester under Lightning Impulse Voltage  
Zhou, Shiyi<sup>1</sup>; Wang, Haoran<sup>1</sup>; Tian, Huidong<sup>1</sup>; Wu, Zehua<sup>1</sup>; Cheng, Jianwei<sup>2</sup>; Liu, Peng<sup>1</sup>; Peng, Zongren<sup>1</sup>; 1: Xi'an Jiaotong University, China; 2: China Southern Power Grid Science Research Institute Co. Ltd. (1331)
- 4A-20 Research on wetting characteristics of insulator in ultrasonic fog  
Cao, Bin<sup>1</sup>; Ma, Xudong<sup>2</sup>; Li, Mingze<sup>1</sup>; Wang, Liming<sup>1</sup>; Mei, Hongwei<sup>1</sup>; Kang, Jun<sup>2</sup>; 1: Tsinghua University, China; 2: Electric Power Research Institutes of State Grid Qinghai Electric Power Company, China (1358)
- 4A-21 Wetting and Self-cleaning Properties of Silicone Rubber Surfaces treated by atmospheric plasma jet  
Vazirinasab, Elham; Jafari, reza; Momen, Gelareh; UQAC, Canada (1378)
- 4A-22 Effect of UV Radiation Aging on Creepage Discharge Characteristics of HTV Silicon Rubber at High Altitude  
Jin, Fubao; QingHai University, China (1135)
- 4A-23 Pattern Analysis of Discharge Characteristics for Condition Evaluation of Polymer Insulators in Fog-Haze Environment  
Zhou, Kai<sup>1</sup>; Liu, Yong<sup>2</sup>; Ye, Kuan<sup>1</sup>; Li, Chunsheng<sup>1</sup>; Wang, Qian<sup>1</sup>; Cai, Yingmiao<sup>1</sup>; Yang, Liang<sup>1</sup>; Zhang, Ruizhe<sup>1</sup>; 1: State Grid Beijing Electric Power Research Institute, China; 2: School of Electrical and Information Engineering, Tianjin University, China (1180)
- 4A-24 An Insulator's Pollution Flashover Model Based on the Formation Mechanism of Dry Bands  
Kai, Gao<sup>1</sup>; Huang, Hua<sup>1</sup>; Wang, Heng<sup>2</sup>; Li, Xue-wen<sup>2</sup>; Jin, Li-Jun<sup>2</sup>; 1: State Grid Shanghai Electric Power Research Institute, State Grid Municipal Electric Power Company, China; 2: School of Electronic and Information Engineering, Tongji University, China (1385)
- 4A-25 Simulation of Composite Insulator Interface Defects in Partial Discharge  
Huang, Zhen<sup>1</sup>; Zhang, Zhonghao<sup>2</sup>; Wang, Rui<sup>1</sup>; Huang, Xinyu<sup>2</sup>; Peng, Xiangyang<sup>1</sup>; Wang, Liming<sup>2</sup>; Nie, Zhangxiang<sup>1</sup>; Yang Daiming<sup>2</sup>; 1: Guangdong Electric Power Research Institute, China; 2: Graduate School at Shenzhen, Tsinghua University, China (1339)
- 4A-26 Suppression of Dry-Band Arcing Erosion by Silica Filler in Silicone Rubber Composites  
Kone, Daouda<sup>1,2</sup>; Ghunem, Refat Atef<sup>2</sup>; El-Hag, Ayman H.<sup>3</sup>; Hadjadj, Yazid<sup>2</sup>; Cisse, Ladjji<sup>1</sup>; Bangash, Kashif Naeem<sup>4</sup>; 1: University Felix Houphouët-Boigny, Côte d'Ivoire; 2: National Research Council Canada, Canada; 3: University of Waterloo, Canada; 4: American University of Sharjah, United Arab Emirates (1111)
- 4A-27 Enhancement of Hydrophobicity for Polymeric Insulator with Zirconia Nanofillers  
S, Subashini; Ramesh, Rahul; Sugumaran, C Pugazhendhi; College of Engineering Guindy, India (1318)
- 4A-28 Study on the Influence of Electric Field Distribution on Insulator Surface Flashover  
Liu, Lin; Li, Xiaoang; Zhang, Qiaogen; Xian Jiaotong University, China (1297)

#### Session 4B – Measurement Techniques

- 4B-1 Design of High Voltage Dielectric Spectroscopy Measurement System for Bushing Moisture Detection  
Zeng, Zipeng; Qi, Bo; Dai, Quanming; Li, Chengrong; North China Electric Power University, China (1138)
- 4B-2 Standard Evolution for the Determination of the Power Frequency Breakdown Voltages in Insulating Liquids  
Pompili, Massimo<sup>1</sup>; Calcara, Luigi<sup>1</sup>; Sangiovanni, Silvia<sup>1</sup>; Baur, Martin<sup>2</sup>; Knauer, Jens<sup>2</sup>; 1: University of Roma "La Sapienza", Italy; 2: BAUR GmbH, Sulz, Austria (1174)
- 4B-3 Effects of Sample Adhesives Acoustic Properties on Spatial Resolution of Pulsed Electroacoustic Measurements  
Gibson, Zachary<sup>1</sup>; Dennison, JR<sup>1</sup>; Pearson, Lee<sup>2</sup>; Griffiths,

- Erick<sup>2</sup>; Pearson, Anthony<sup>2</sup>; Griseri, Virginie<sup>3</sup>; 1: Utah State University; 2: Box Elder Innovations, LLC; 3: Université de Toulouse (1241)*
- 4B-4 Frequency Response of the Transformer Winding: a Case Study based on a Laboratory Model  
*Mohamed Youssouf, Roda<sup>1</sup>; Ferreira, Regeli S. A.<sup>1</sup>; Meghnefi, Fethi<sup>1</sup>; Ezzaidi, Hassan<sup>1</sup>; Picher, Patrick<sup>2</sup>; Fofana, Issouf<sup>1</sup>; 1: University of Quebec at Chicoutimi (UQAC), Canada; 2: Institut de recherche d'Hydro-Québec (IREQ), Varennes, QC Canada (1242)*
- 4B-5 The Acoustic Wave Behavior Within the PEA Cell for Space Charge Measurement  
*Imburgia, Antonino<sup>1</sup>; Romano, Pietro<sup>1</sup>; Chen, George<sup>2</sup>; Huang, Bo<sup>2</sup>; Ala, Guido<sup>1</sup>; Riva Sanseverino, Eleonora<sup>1</sup>; Viola, Fabio<sup>1</sup>; 1: L.E.P.R.E. HV Laboratory, DEIM University of Palermo, Italy; 2: The Tony Davies High Voltage Laboratory, University of Southampton, UK (1283)*
- 4B-6 Study of water content in power transformer oils through ultrasonic measurements  
*Palito, Thamyres T. C.<sup>1</sup>; Assagra, Yuri A. O.<sup>1</sup>; Altafim, Ruy A. C.<sup>1</sup>; Carneiro, Antonio A. O.<sup>2</sup>; Carmo, Joao P. P.<sup>1</sup>; Altafim, Ruy A. P.<sup>3</sup>; 1: Electrical and Computer Engineering Department, University of Sao Paulo; 2: Physics Department, University of Sao Paulo; 3: Computer Systems Department, Federal University of Paraiba (1284)*
- 4B-7 Application of disruptive tests for the determination of BIL through spinterometric spheres in the high voltage laboratory of the Salesian Polytechnic University  
*Quizhpi, Flavio; Criollo, Diego; Tapia, Sebastian; Universidad Politécnica Salesiana, Ecuador (1307)*
- 4B-8 Effect of cable joint on Frequency Domain Analysis as a cable diagnostic method  
*Norouzi, Younes<sup>1</sup>; Braun, Sebastian<sup>2</sup>; Frohne, Christian<sup>1</sup>; Gauler, Volker<sup>1</sup>; Seifi, Sahand<sup>2</sup>; Werle, Peter<sup>2</sup>; 1: Nexans Germany GmbH, Germany; 2: Leibniz university Germany, Institute of Electric Power Systems, Division of High Voltage Engineering and Asset Management, Schering-Institute (1317)*
- 4B-9 Simultaneous detection of Dissolved Methane and Ethane in Transformer Oil Based on Laser Raman Spectroscopy  
*Jiang, Jun<sup>1</sup>; Wang, Zhuowei<sup>1</sup>; Zhang, Chaohai<sup>1</sup>; Feng, Yuan<sup>2</sup>; Xu, Wanli<sup>2</sup>; 1: Nanjing University of Aeronautics and Astronautics, China; 2: Jiangsu Nari Hengchi Electrical Equipment CO.,LTD., China (1332)*
- 4B-10 Rapid In-situ Analysis for Methyl Ethyl Ketone Dissolved in Transformer Oil Using Surface Enhanced Raman Scattering  
*Gu, Zhaoliang<sup>1</sup>; Gu, Chao<sup>1</sup>; Zhu, Wenbing<sup>1</sup>; Xu, Qiang<sup>2</sup>; Wang, Xuelei<sup>1</sup>; Han, Mingming<sup>1</sup>; Li, Longlong<sup>1</sup>; Wang, Jihao<sup>1</sup>; Chen, Weigen<sup>3</sup>; 1: State Grid Shandong Electric Power Research Institute, China; 2: Maintenance Company of State Grid Anhui Electric Power Corporation, China; 3: Chongqing University, China (1342)*
- 4B-11 Study on Infrared Image Data Fusion Technique for Thermal Defect Diagnosing of GIS  
*Gao, Kai<sup>1</sup>; Ma, Li<sup>2</sup>; Wang, Heng<sup>2</sup>; Jin, Li-jun<sup>2</sup>; 1: State Grid Shanghai Electric Power Research Institute, China; 2: Tongji University, China (1386)*
- 4B-12 Space Charge Measurements under DC and DC Periodic Waveform  
*Romano, Pietro<sup>1</sup>; Imburgia, Antonino<sup>1</sup>; Candela, Roberto<sup>2</sup>; 1: L.E.P.R.E. HV Laboratory, DEIM University of Palermo, Italy; 2: Prysmian Group, Milano, Italy (1293)*

- 4B-13 Study on Detection of Insulator Defects in Time Domain Terahertz Wave  
*Wang, Rui<sup>1</sup>; zhang, zhonghao<sup>2</sup>; Yang, Cui<sup>1</sup>; Nie, Zhangxiang<sup>1</sup>; Wang, Liming<sup>2</sup>; Peng, Xiangyang<sup>1</sup>; Huang, Zhen<sup>1</sup>; Yang Daiming<sup>2</sup>; 1: Guangdong Electric Power Research Institute, China; 2: Graduate School at Shenzhen, Tsinghua University, China (1340)*

## Tuesday, October 23, 2018

### 8:00-10:00 Session 5 (Oral) Outdoor insulation, Surface Flashover and GIS

Chair: Huseyin Recai Hiziroglu, Kettering University, USA  
 Co-chair: Yuriy Serdyuk, Chalmers Uni. of Tech., Sweden

- 5-1 Comparison of Different Residual Resistance Calculation Methods used in Predictive Insulator Flashover Models  
*Jabbari, Marouane; Volat, Christophe; Fofana, Issouf; Université du Québec à Chicoutimi, Canada (1309)*
- 5-2 Preliminary Study on Nondestructive Testing Method for Composite Insulators Based on Digital Shearography  
*Liu, Lishuai<sup>1</sup>; Guo, Chenjun<sup>2</sup>; Mei, Hongwei<sup>1</sup>; Wang, Liming<sup>1</sup>; Yu, Hong<sup>2</sup>; Ma, Yi<sup>2</sup>; 1: Graduate School at Shenzhen, Tsinghua University, China; 2: Electric Power Research Institute, Yunnan Power Grid Co., Ltd., China (1234)*
- 5-3 Evidencing of the Capacitive Effects on the Development of Creeping Discharges at Solid/Fluid Interfaces  
*Beroual, Abderrahmane<sup>1</sup>; Khaled, Usama<sup>2</sup>; 1: Ampere Lab CNRS UMR 5005, Ecole Centrale de Lyon, University of Lyon, France; 2: College of Engineering, King Saud University (1139)*
- 5-4 Electric Field Grading by Functionally Graded Materials (FGM) for HVDC Gas Insulated Power Apparatus  
*Hayakawa, Naoki<sup>1</sup>; Oishi, Ryota<sup>1</sup>; Kojima, Hiroki<sup>1</sup>; Kato, Katsumi<sup>2</sup>; Zebouchi, Nabila<sup>3</sup>; 1: Nagoya University, Japan; 2: National Institute of Technology, Niihama College, Japan; 3: Cardiff University, UK (1125)*
- 5-5 On the Electrical Characteristic and Heat Dissipation of High Voltage Surface Arcs  
*Kuehnel, Stefan<sup>1</sup>; Kornhuber, Stefan<sup>1</sup>; Lambrecht, Jens<sup>2</sup>; 1: University of Applied Sciences Zittau/Goerlitz, Germany; 2: Wacker Chemie AG, Germany (1274)*
- 5-6 Low-Voltage Arc Interruption Computation: the Effect of Stefan Flow  
*Huo, Jindong<sup>1</sup>; Selezneva, Svetlana<sup>2</sup>; Jacobs, Linda<sup>3</sup>; Cao, Yang<sup>1,4</sup>; 1: Institute of Materials Science, University of Connecticut, USA; 2: GE Global Research Center, USA; 3: ABB Industrial Connections & Solutions LLC, USA; 4: Electrical and Computer Engineering, University of Connecticut, USA (1371)*

### 10:00-10:30 Break

### 10:30-12:30 Session 6 (poster)

Chair: Boxue Du, Tianjin University, China

#### Session 6A – Aging and Treeing

- 6A-1 Estimation of a Stress-Strength Insulation Reliability Model By Means of a New Bayes Method  
*Chiodo, Elio<sup>1</sup>; Di Noia, Luigi<sup>2</sup>; Mazzanti, Giovanni<sup>3</sup>; Mottola, Fabio<sup>4</sup>; 1: Department of Industrial Engineering, University of Naples Federico II, Italy; 2: Department of Electrical Engineering and Information Technology, University of Naples Federico II, Italy; 3: Department of Electrical,*

- Electronic and Information Engineering, University of Bologna, Italy; 4: Department of Engineering, University of Naples Parthenope, Naples, Italy (1103)*
- 6A-2 Underground power cables ageing: species migration from semi-conductive layers to insulation layer  
*Pelzer, Quentin; EDF / LEPMI, France (1121)*
- 6A-3 A Novel Furfural-detection-method for the Aging Prediction of Paper Insulation in Power Transformer  
*Peng, Lei<sup>1</sup>; Fu, Qiang<sup>1</sup>; Lin, Musong<sup>1</sup>; Zhao, Yaohong<sup>1</sup>; Qian, Yihua<sup>1</sup>; Li, Shengli<sup>2</sup>; 1: Guangdong Power Grid Co., Ltd., China; 2: Huazhong university of science and technology, China (1133)*
- 6A-4 Study on Transformer's Aging State Evaluation Based on PDC Method  
*Li, Hua; Xu, Qingchuan; Lin, Fuchang; Tao, Xiantao; School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, China (1143)*
- 6A-5 Effectiveness of Stress Grading System Builds on the Heat Production in the Overhang Region of an Inverter-fed Rotating Machine  
*Naeini, Alireza; Cherney, Edward A.; Jayaram, Shesha; University of Waterloo, Canada (1145)*
- 6A-6 Influence of Silica Filler Particle Size in Epoxy Resins on the Electrical Treeing Characteristic  
*Yamada, Daichi; Kawashima, Tomohiro; Hozumi, Naohiro; Murakami, Yoshinobu; Toyohashi University of Technology, Japan(1151)*
- 6A-7 Electrical tree growth under very low frequency (VLF) voltage excitation  
*Schurich, Roger; Donoso, Pablo; Ardila-Rey, Jorge; Montana, Johnny; Angulo, Alejandro; Universidad Tecnica Federico Santa Maria, Chile (1159)*
- 6A-8 Effect of sheath plastic deformation on Electric field in three core submarine cables  
*Hamdan, Mohammad; Pilgrim, Dr. James; Lewin, Prof. Paul; University of Southampton, United Kingdom (1156)*
- 6A-9 Determination of the Effects of Accelerated Ageing on the Dielectric Properties of LLDPE and LLDPE/HNT Composites  
*Kadlec, Petr<sup>1</sup>; Polanský, Radek<sup>2</sup>; Prosr, Pavel<sup>2</sup>; 1: UWB in Pilsen, Czech; 2: UWB/RICE in Pilsen, Czech (1167)*
- 6A-10 The effect of the method of transport to the processing of PVC granules  
*Prosr, Pavel<sup>1</sup>; Chudoba, Vít<sup>2</sup>; Polanský, Radek<sup>1</sup>; Pihera, Josef<sup>1</sup>; 1: UWB/RICE in Pilsen, Czech; 2: Kablo Vrchlábí s.r.o, Czech (1168)*
- 6A-11 Chemical Structure and Breakdown Behaviors of a New AC 500kV XLPE Submarine Cable Insulation with Different Thermal Aging Conditions  
*Wang, Xiaojian<sup>1</sup>; Gao, Zhen<sup>2</sup>; Zhu, Zhigang<sup>1</sup>; Li, Shiqiang<sup>2</sup>; Liu, Zhiqian<sup>3</sup>; Hao, Jian<sup>3</sup>; 1: State Grid Zhejiang Electric Power Supply Company, China; 2: Zhoushan Power Supply Company of State Grid Zhejiang Electric Power Supply Company, China; 3: State Key Laboratory of Power Transmission Equipment & System Security and New Technology, Chongqing University, China (1175)*
- 6A-12 Effect of bending stress on the sulfur corrosion of transformer winding  
*Wei, Chao<sup>1</sup>; lu, Yuncai<sup>1</sup>; Yuan, Yuan<sup>2</sup>; Zhou, Jiang<sup>3</sup>; Jiang, Youdong<sup>2</sup>; 1: Electric Power Research Institute of State Grid Jiangsu Power Grid Co., Ltd., Nanjing, China; 2: School of Materials Science and Engineering, Chongqing University, in China; 3: School of Electrical Engineering, Chongqing University, in China (1187)*
- 6A-13 Discharge-induced ignition of combustible on ac power supply cord  
*Ishikawa, Yusuke<sup>1</sup>; Takenaka, Kiyoto<sup>1</sup>; Mizuno, Yukio<sup>1</sup>; Yoshida, Atsush<sup>2</sup>; 1: Nagoya Institute of Technology, Japan; 2: Kawamura Electric Inc., Japan (1189)*
- 6A-14 Molecular Dynamics Simulation and Density-Functional Analysis on Suppression Effect of Electrical Tree in Antioxidant-added Polyethylene  
*Uehara, Hiroaki<sup>1</sup>; Iwata, Shinya<sup>2</sup>; Wang, Weiwang<sup>3</sup>; Sekii, Yasuo<sup>4</sup>; Takada, Tatsuo<sup>5</sup>; Cao, Yang<sup>6</sup>; 1: Kanto Gakuin University, Japan; 2: Osaka Research Institute of Industrial Science and Technology, Japan; 3: Xi'an Jiaotong University, China; 4: Sekii PE Laboratory, Japan; 5: Tokyo City University, Japan; 6: University of Connecticut, USA (1197)*
- 6A-15 Genesis, Identification and Bayes Estimation of the Inverse Power Model for Insulation Reliability Assessment  
*Chiodo, Elio<sup>1</sup>; Di Noia, Luigi Pio<sup>2</sup>; Mazzanti, Giovanni<sup>3</sup>; Mottola, Fabio<sup>4</sup>; 1: Department of Industrial Engineering, University of Naples Federico II, Italy; 2: Dept. Electr. Engineering and Information Technology, University of Naples Federico II, Italy; 3: Department of Electrical, Electronic and Information Engineering, University of Bologna, Italy; 4: Department of Engineering, University of Naples Parthenope, Naples, Italy (1207)*
- 6A-16 Effects of heat and radiation aging and burning on the surface physical properties of polymer-insulated cables  
*Ito, Seitaro; Hirai, Naoshi; Minakawa, Takefumi; Kuroda, Chiaki; Ohki, Yoshimichi; Waseda University, Japan (1210)*
- 6A-17 Trap Characteristic and Potential Trap Model of Water Trees in XLPE  
*Tao, Xiantao; Li, Hua; Rao, Jiandong; Zhang, Qin; Tu, Jingyun; Yan, Gen; Xu, Qingchuan; Liu, Yi; Lin, Fuchang; Huazhong University of Science and Technology, China (1215)*
- 6A-18 Effect of electric field on methanol generation based on accelerated aging experiment  
*Li, Chong<sup>1</sup>; Wu, Kai<sup>1</sup>; Li, Zhi<sup>1</sup>; Yang, Yong<sup>2</sup>; Qian, Kang<sup>2</sup>; Kang, Xiaohua<sup>2</sup>; 1: Xi'an Jiaotong University, China; 2: Electric Power Research Institute, Gansu Power Grid Co., Ltd. , China (1218)*
- 6A-19 The Impact of Crevice Corrosion on Copper Winding in Insulating Oil with Corrosive Sulfur  
*Yuan, Yuan; Jiang, Youdong; Zhou, Jiang; Liu, Guoyong; Liao, Ruijing; Chongqing University, China (1220)*
- 6A-20 Monitoring cable current and laying environment parameters for assessing the aging rate of MV cable joint insulation  
*Peretto, Lorenzo<sup>1</sup>; Tinarelli, Roberto<sup>1</sup>; Ghaderi, Abbas<sup>1</sup>; Mingotti, Alessandro<sup>1</sup>; Mazzanti, Giovanni<sup>1</sup>; Valtorta, Giovanni<sup>2</sup>; Amoroso, Giuseppe<sup>2</sup>; Danesi, Stefano<sup>2</sup>; 1: Department of Electrical, Electronic and Information Engineering - Alma Mater Studiorum - University of Bologna, Italy; 2: e-distribuzione S.p.A., Roma, Italy (1235)*
- 6A-21 Study on Gasses Generated in the Aging Process of Silicone Oil in Cable Terminals  
*Zhang, Ruobing; Qiu, Zhichun; Wu, Jun; Graduate School at Shenzhen, Tsinghua University, China (1246)*
- 6A-22 Sulfur Corrosion in Bushing and Its Effect on The Property of Oil  
*Liu, Guoyong; Yuan, Yuan; Zhou, Jiang; Jiang, Youdong; Liao, Ruijin; Chongqing University, China (1265)*
- 6A-23 Validity Evaluation Method of DGA Monitoring Sensor in



- Power Transformer Based on Big Data Analysis  
Zhou, Zhengqin<sup>1</sup>; Xiao, Li<sup>1</sup>; Nie, Dexin<sup>1</sup>; Qi, Bo<sup>2</sup>; Zhang, Peng<sup>2</sup>; Gao, Chunjia<sup>2</sup>; Li, Chengrong<sup>2</sup>; 1: Wuhan NARI Limited Liability Company of State Grid Electric Power Research Institute; 2: North China Electric Power University, China (1286)
- 6A-24 Combination Prediction Method of Power Transformers Based on Feature Gas Arrangement Diagram and Gray Model  
Xu, Xiaolu<sup>1</sup>; Cheng, Lin<sup>1</sup>; Nie, Dexin<sup>1</sup>; Wang, Yiming<sup>2</sup>; Qi, Bo<sup>2</sup>; Zhang, Peng<sup>2</sup>; Gao, Chunjia<sup>2</sup>; Li, Chengrong<sup>2</sup>; 1: Wuhan NARI Limited Liability Company of State Grid Electric Power Research Institute, China; 2: North China Electric Power University, China (1289)
- 6A-25 State Prediction Method of Power Transformers Based on the Gray Model of Differentiation Threshold  
Feng, Zhenxin<sup>1</sup>; Jiang, Yi<sup>1</sup>; Nie, Dexin<sup>1</sup>; Wang, Yiming<sup>2</sup>; Qi, Bo<sup>2</sup>; Zhang, Peng<sup>2</sup>; Gao, Chunjia<sup>2</sup>; Li, Chengrong<sup>2</sup>; 1: Wuhan NARI Limited Liability Company of State Grid Electric Power Research Institute, China; 2: North China Electric Power University, China (1290)
- 6A-26 The relationship of 10kV XLPE Cable between moisture content and FDS curves  
Zhao, Aixuan<sup>1</sup>; Chen, Xi<sup>1</sup>; Xu, Long<sup>1</sup>; Li, Jiaming<sup>1</sup>; Zhao, Xuefeng<sup>2</sup>; Pu, Lu<sup>2</sup>; Deng, Junbo<sup>1</sup>; Zhang, Guanjun<sup>1</sup>; 1: Xi'an Jiaotong University, China; 2: State Grid Shaanxi Electric Power Research, Xi'an, China (1335)
- 6A-27 Effect of Short Circuit Currents on thermo-mechanical properties of insulated cables  
Hamdan, Mohammad Anan; Pilgrim, James; Lewin, Paul; University of Southampton, United Kingdom (1155)
- 6A-28 Uphill Diffusion of Antioxidant in Cross-Linked Polyethylene  
Chang, Yuan-Shang; Mosleh, Ali; University of California, Los Angeles (UCLA), USA (1351)
- 6A-29 Moisture Ingress of Metallized Film Capacitor under High Temperature and Different Humidity Conditions  
Chen, Qiren<sup>1</sup>; Li, Hua<sup>1,2,3</sup>; Li, Liwei<sup>2</sup>; Li, Lu<sup>2</sup>; Jiang, Haoyu<sup>2</sup>; Liu, Yi<sup>1</sup>; Zhang, Qin<sup>1</sup>; Lin, Fuchang<sup>1,2,3</sup>; 1: School of Electrical and Electronic Engineering, Huazhong University of Science & Technology, China.; 2: State Key Laboratory of Advanced Electromagnetic Engineering and Technology, Huazhong University of Science & Technology, China.; 3: Key Laboratory of Pulsed Power Technology, Huazhong University of Science and Technology, China (1373)
- 6A-30 Comparison of mineral oil behavior with and without the presence of catalysts during accelerated thermal aging  
Hahn, Pavel; Polanský, Radek; Faculty of Electrical Engineering, Czech (1375)
- 6A-31 Analysis of gamma irradiation effect on PTFE films by FTIR and DSC  
Saidi, Nadia<sup>1</sup>; GRISERI, Virginie<sup>2</sup>; Mouaci, Sarah<sup>1</sup>; Mezouar, Ali<sup>1</sup>; Teyssedre, Gilbert<sup>2</sup>; Saidi, Mohamed<sup>1</sup>; 1: University USTHB, Algeria; 2: University UPS, France (1384)
- 6A-32 Aging investigation of polyethylene-based insulation through broadband dielectric spectroscopy  
Suraci, Simone<sup>1</sup>; Fabiani, Davide<sup>1</sup>; Mazzocchetti, Laura<sup>2</sup>; Maceratesi Vittorio<sup>2</sup>; Merighi Stefano<sup>2</sup>; 1: DEI - University of Bologna, Italy; 2: Dept. of Industrial Chemistry, University of Bologna, Italy (1381)
- 6A-33 How Far are Furan Compounds Reliable Indicators for Thermal Aging of Oil Impregnated Cellulose Insulation?  
Imani, Mohammad Taghi<sup>1</sup>; Homeier, Kristin<sup>1</sup>; Werle, Peter<sup>1</sup>; Dräger, Gerald<sup>2</sup>; 1: Leibniz Universität Hannover, Institute of Electric Power Systems, Division of High Voltage Engineering and Asset Management, Schering-Institute; 2: Leibniz Universität Hannover, Institute of Organic Chemistry (1272)
- 6A-34 Qualitative Energy Analysis of treeing in XLPE as a function of the frequency of the applied voltage  
Poblano, Gabino<sup>1</sup>; Calva, Primo Alberto<sup>2</sup>; Azcarraga, Carlos<sup>1</sup>; 1: Instituto Nacional de Electricidad y Energías Limpias, Mexico; 2: Instituto Politécnico Nacional (1302)
- Session 6B – High Field Effects and Field Mapping**
- 6B-1 Time and Space Dependent Characteristics of HVDC Electric Field Stress in Oil-pressboard Composite Insulation Systems  
Nakane, Ryuichi<sup>1</sup>; Kato, Katsumi<sup>2</sup>; Okubo, Hitoshi<sup>1</sup>; 1: Aichi Institute of technology, Japan; 2: National Institute of Technology, Niihama Collage, Niihama, Japan (1102)
- 6B-2 Calculation of three 3-D ion flow field near the ±1100kV transmission tower  
Zhang, Qian; Li, Yinfei; Li, Xuebao; Lu, Tiebing; North China Electric Power University, China (1191)
- 6B-3 Insulation system design and insulating material requirement analysis of a novel rolling-ring electric rotary joint  
Liu, Zili<sup>1</sup>; Hou, Xinbin<sup>1</sup>; Min, Daomin<sup>2</sup>; Li, Shengtao<sup>2</sup>; Liu, Wenfeng<sup>2</sup>; 1: China Academy of space technology, China; 2: Xi'an jiaotong university, China (1263)
- 6B-4 Study on elementary insulating properties of PEEK available for space-used huge-power transmitting rolling-ring electric rotary joint  
Liu, Zili<sup>1</sup>; Hou, Xinbin<sup>1</sup>; Wang, Weiwang<sup>2</sup>; Min, Daomin<sup>2</sup>; Li, Shengtao<sup>2</sup>; Chang, Yanan<sup>3</sup>; 1: China Academy of space technology, China; 2: Xi'an jiaotong University, China; 3: North China Electric Power University, China (1264)
- 6B-5 DC Conductivity and Joule Heat Effect in the 320kV XLPE Cables  
Zhang, Chong<sup>1,2</sup>; Li, Wenpeng<sup>2,3</sup>; Li, Weikang<sup>2</sup>; Zhao, Weijia<sup>2</sup>; Yan, Hongda<sup>2</sup>; Shi, Xiaoning<sup>2</sup>; Chen, Xin<sup>2</sup>; Cao, Liang<sup>3</sup>; 1: University of Science and Technology Beijing, China; 2: State Grid, China; 3: Xi'an Jiaotong University, China (1380)
- 6B-6 Experimental investigation on the influence of AC voltage on the DC positive corona current pulses from DC conductor parallel with AC conductor  
Li, Yinfei; Li, Xuebao; Zhang, Qian; LU, Tiebing; North China Electric Power University, China (1185)
- 6B-7 Comparison of the Volume and Surface approaches to compute Temperature and Electric Field along the Stress-Grading on Stators Bars  
Kone, Gbah; Volat, Christophe; Université du Québec à Chicoutimi, Canada (1308)
- 6B-8 Surface Charge Tailoring Strategy Based on Temperature Field Regulation  
Lin, Chuanjie; Li, Qi; Li, Chuanyang; He, Jinliang; Tsinghua University, China (1229)
- 6B-9 Study on High Temperature Heating Characteristics of Degraded Composite Insulators  
Peng, Xiangyang<sup>1</sup>; Huang, Xinyu<sup>2</sup>; Zhang, zhonghao<sup>2</sup>; Nie, zhangxiang<sup>1</sup>; Yang, Cui<sup>1</sup>; Huang, Zhen<sup>1</sup>; Wang, Liming<sup>1</sup>; 1: Guangdong Electric Power Research Institute, China; 2: Graduate School at Shenzhen, Tsinghua University, China (1341)

**No technical sessions in the afternoon**

12.30-18:00 Cultural tour

12.30-18:00 DEIS AdCom Meeting

18:00-21:00 Reception and Banquet

## Wednesday, October 24, 2018

### 8:00-10:00 Session 7 (Oral) Partial Discharge and Measurement Techniques

Chair: Naoki Hayakawa, Nagoya University, Japan  
Co-chair: Rodolfo Garcia Colon, INEEL, Mexico

- 7-1 Dependence of the Field and Charge Distribution at Semicon/Polyethylene Interface on the Press-molding Process Derived from Kelvin Probe Force Microscopy  
Gullo, F<sup>1</sup>; Christen, T<sup>2</sup>; Villeneuve Faure, C<sup>1</sup>; Hillborg, H<sup>3</sup>; Laurent, C<sup>1</sup>; Le Roy, S<sup>1</sup>; Teyssedre, G<sup>1</sup>; 1: LAPLACE, Université de Toulouse, CNRS, France; 2: ABB Corporate Research, Baden, Switzerland; 3: ABB Corporate Research, Vasteras, Sweden (1204)
- 7-2 Issues in Space Charge Measurements with the PEA Technique in HVDC Cables: Applicative Case Studies  
Albertini, Marco<sup>1</sup>; Franchi Bononi, Stefano<sup>1</sup>; Giannini, Simone<sup>1</sup>; Troia, Ivan<sup>1</sup>; Sica, Gerardo<sup>1</sup>; Mazzanti, Giovanni<sup>2</sup>; Pini, Dario<sup>2</sup>; 1: Prysmian Cables & Systems, R&D Headquarters, Milano, Italy; 2: Department of Electrical, Electronic and Information Engineering, University of Bologna, Italy (1158)
- 7-3 Surface Discharge Behaviour of Coated Electrodes in Gas-Insulated systems under DC Voltage Stress  
Götz, Thomas<sup>1</sup>; Esmaeil Moghadam, Davoud<sup>1</sup>; Simka, Philipp<sup>2</sup>; Riechert, Uwe<sup>2</sup>; Speck, Joachim<sup>1</sup>; Backhaus, Karsten<sup>2</sup>; Gabler, Tobias<sup>1</sup>; Großmann, Steffen<sup>1</sup>; 1: Technische Universität Dresden, Germany; 2: ABB Switzerland Ltd., Switzerland (1152)
- 7-4 Partial Discharge Inception Characteristics in Air with Solid Dielectrics under HVDC and Polarity Reversal Conditions  
Okubo, Hitoshi<sup>1</sup>; Nakane, Ryuichi<sup>1</sup>; Okamoto, Kenji<sup>2</sup>; 1: Aichi Institute of Technology, Japan; 2: Fuji Electric Co. Ltd., Japan (1117)
- 7-5 Tree Propagation and Partial Discharge Phenomena of Nanocomposite Epoxy  
Nakamura, Takahiro<sup>1</sup>; Yokoi, Takaki<sup>2</sup>; Kumada, Akiko<sup>2</sup>; Hidaka, Kunihiko<sup>2</sup>; Hirai, Hiromitsu<sup>3</sup>; Imai, Takahiro<sup>3</sup>; Yoshimitsu, Tetsuo<sup>1</sup>; 1: Toshiba Mitsubishi-Electric Industry Corporation, Japan; 2: The University of Tokyo, Japan; 3: Toshiba Corporation, Japan (1163)
- 7-6 Effect of Temperature Changes on Thin Film Sacrificial Copper Strips due to Sulfur Corrosion  
Ahmad Khair, Mohd Shahril Bin<sup>1,2</sup>; Lewin, Paul L.<sup>1</sup>; Brown, Richard C.D.<sup>3</sup>; 1: The Tony Davies High Voltage Laboratory, University of Southampton, United Kingdom; 2: Universiti Teknikal Malaysia Melaka (UTeM), Malaysia; 3: Department of Chemistry, University of Southampton, United Kingdom (1278)

10:00-10:30 Break

### 10:30-12:30 Session 8 (poster)

Chair: Masayuki Kozako, Kyushu Institute of Tech., Japan

#### Session 8A – Partial Discharge

8A-1 Methods of Characterisation of DC Partial Discharge in Polymeric Cable Insulation

Morris, Euan Andrew<sup>1,2</sup>; Siew, W H<sup>2</sup>; Given, Martin J<sup>2</sup>; 1: EPSRC CDT in Future Power Networks and Smart Grids; 2: University of Strathclyde, United Kingdom (1105)

8A-2 A New Wavelet Selection Scheme for Partial Discharge Denoising

Liu, Jiajia; Morris, Euan; Siew, Wah Hoon; Soraghan, John; University of Strathclyde, United Kingdom (1110)

8A-3 A Novel Ultra-high Frequency Antenna used For PD Tests at Repetitive Impulsive Voltages with Fast Rise times  
Gong, Yuanquan<sup>1</sup>; Wang, Peng<sup>2</sup>; Zhou, Wanya<sup>2</sup>; Zhang, Jiawei<sup>3</sup>; Cavallini, Andrea<sup>4</sup>; 1: Shanghai Electric Wind Power Group Co., Ltd, China; 2: Sichuan University, China; 3: Northeast Electric Power University, China; 4: University of Bologna, Italy (1112)

8A-4 The Influence of Humidity on Partial Discharge and Endurance Features under Repetitive Impulsive Voltages  
Wang, Peng<sup>1</sup>; Li, Ying<sup>1</sup>; Cavallini, Andrea<sup>2</sup>; Zhang, Jiawei<sup>3</sup>; Xiang, Enxin<sup>4</sup>; Wang, Ke<sup>4</sup>; 1: Sichuan University, China; 2: University of Bologna, Italy; 3: Northeast Electric Power University, China; 4: Yunnan Electric Power Research Institute, Yunnan Power Co., Ltd, China (1113)

8A-5 Partial Discharge Detection in SF<sub>6</sub> Gas with a SiPM Sensor  
Zhou, Jierui; Ren, Ming; Wang, Siyun; Hou, Yunting; Zhang, Chongxing; Dong, Ming; Zhuang, Tianxin; Xi'an Jiaotong University, China (1140)

8A-6 Feature Parameters Extraction of GIS Partial Discharge Signals Based on Multiple Scale Higher-order Cumulants Matrix Singular Value Decomposition  
Liu, Yushun<sup>1</sup>; Cheng, Dengfeng<sup>1</sup>; Yin, Qiaoling<sup>2</sup>; Xie, Qian<sup>3</sup>; 1: Anhui Grid Co., Anhui Electric Power Research Institute, China; 2: Anhui Grid Co., Hefei Power Company, China; 3: Sichuan Grid Co., Sichuan Electric Power Research Institute, China (1149)

8A-7 Multiple Partial Discharge Signal Decomposition using Mathematical Morphology  
Nik Ali, Nik Hakim<sup>1</sup>; Rapisarda, Paolo<sup>2</sup>; Lewin, Paul<sup>1</sup>; 1: The Tony Davies High Voltage Laboratory, University of Southampton, UK.; 2: Communications, Signal Processing and Control, University of Southampton, UK. (1153)

8A-8 Correlation between Partial Discharge Inception Voltage and Breakdown Voltage Characteristics of Butt-gap in HVDC Mass Impregnated PPLP Cable  
Oh, DongHun; Lee, HoYoung; Kim, SunJin; Lee, BangWook; Hanyang University, Korea (1228)

8A-9 Optimized Arrival Time Determination of UHF Pulses for Localization of Partial Discharge in Power Transformers  
Akbari Azirani, Mohammad<sup>1</sup>; Ariannik, Mohamadreza<sup>1</sup>; Werle, Peter<sup>1</sup>; Akbari, Asghar<sup>2</sup>; 1: Leibniz Universität Hannover, Germany; 2: K. N. Toosi University of Technology, Tehran, Iran (1240)

8A-10 Breakdown Tests on Polyester Posts Reinforced with Fiberglass to Certify the Insulation Against Lightning-Type Overvoltages  
Quizhpi, Flavio; Mizquero, Luis; Arias, Henry; Piña, Ramón; Universidad Politécnica Salesiana, Ecuador (1245)

8A-11 Partial Discharge Characteristics of SF<sub>6</sub>/N<sub>2</sub> Gas Mixture Based on the Broadband Time Resolved Measurement  
Zhang, Chongxing; Xi'an Jiaotong University, China (1266)

8A-12 Research on Familial Defect Recognition Method of Transformer Based on Correlation Analysis  
Li, Jinzhong<sup>1</sup>; Wang, Jianyi<sup>1</sup>; Zhu, Shuangjing<sup>2</sup>; Qi, Bo<sup>2</sup>; Zhang, Peng<sup>2</sup>; Gao, Chunjia<sup>2</sup>; Li, Chengrong<sup>2</sup>; 1: China Electric Power Research Institute, China; 2: State Key

Laboratory of Alternate Electrical Power System with Renewable Energy Sources, North China Electric Power University, China (1296)

- 8A-13 Feasibility of Partial Discharge Localization in Power Transformers based on a novel Curve Fitting Method  
*Rahimbakhsh, Mahdi; Mostoofi, Milad; Werle, Peter; Gockenbach, Ernst; Leibniz Universität Hannover, Institute of Electric Power Systems, Division of High Voltage Engineering and Asset Management, Schering-Institute, Germany (1306)*
- 8A-14 Influence of DC component on Partial Discharge activity  
*Guastavino, Francesco; Bruzzone, Andrea; Gianoglio, Christian; Torello, Eugenia; University of Genova, Italy (1322)*
- 8A-15 Hardware friendly Neural Network for the PD classification  
*Guastavino, Francesco; Bruzzone, Andrea; Gianoglio, Christian; Ragusa, Edoardo; Torello, Eugenia; University of Genova, Italy (1325)*
- 8A-16 Quantitative Comparison of Partial Discharge Localization Algorithms on Power transformers based on acoustic method  
*Wang, Yan-bo<sup>1</sup>; Qin, Shao-ru<sup>2</sup>; Wang, Liu-fang<sup>2</sup>; Ding, Guo-cheng<sup>2</sup>; Li, Jian-lin<sup>2</sup>; Zhu, Tai-yun<sup>2</sup>; Zhang, Guan-jun<sup>1</sup>; 1: Xi'an Jiaotong University, China; 2: State Grid Anhui Electric Power Research Institute, China (1236)*
- 8A-17 Research on Feature Reduction Method for Partial Discharge Pattern Recognition of Converter Transformer  
*Zhu, Shuangjing; Qi, Bo; Zhang, Peng; Gao, Chunjia; Li, Chengrong; North China Electric Power University, China (1295)*
- 8A-18 Estimation of Partial Discharge Inception Voltage under Repetitive Inverter Surge Voltage by Volume-Time Theory  
*Hayakawa, Naoki; Daicho, Yuki; Kaji, Takefumi; Kojima, Hiroki; Nagoya University, Japan (1118)*
- 8A-19 Combined Effect of Temperature and Humidity on Partial Discharge Inception Voltage of Magnet Wires under Inverter-Surge Voltage  
*Kaji, Takefumi<sup>1,2</sup>; Asai, Hiromitsu<sup>1</sup>; Kojima, Hiroki<sup>2</sup>; Hayakawa, Naoki<sup>2</sup>; 1: Denso Corporation, Japan; 2: Nagoya University, Japan (1164)*
- 8A-20 Partial Discharge Measurements under DC Voltages Containing Harmonics Produced by Power Electronic Devices  
*Romano, Pietro<sup>1</sup>; Parastar, Amir<sup>2</sup>; Blennow, Jörgen<sup>2</sup>; Bongiorno, Massimo<sup>2</sup>; Di Tommaso, Antonino Oscar<sup>1</sup>; Hammarström, Thomas<sup>2</sup>; Imburgia, Antonino<sup>1</sup>; Serdyuk, Yuriy<sup>2</sup>; 1: L.E.PR.E. HV Laboratory, DEIM University of Palermo, Italy; 2: Chalmers University of Technology, Sweden (1291)*

### Session 8B – Pre-breakdown and Breakdown

- 8B-1 Swarm Parameters in Atmospheric Gas Mixtures of Ar, He with Dry Air by Pulsed Laser-Induced Plasma Method  
*Sasamoto, Ryo; Nomiyama, Ryoji; Tanaka, Naoto; Izawa, Yasuji; Nishijima, Kiyoto; Fukuoka University, Japan (1104)*
- 8B-2 Difference of Discharge Phenomena under GFRP and CFRP Insulation Barrier with Steep Impulse Voltage  
*Tanaka, Naoto; Aoyagi, Daichi; Sasamoto, Ryo; Izawa, Yasuji; Nishijima, Kiyoto; Fukuoka University, Japan (1116)*
- 8B-3 Negative Lightning Impulse Breakdown Characteristics of Pure Water with and without N<sub>2</sub> Fine Bubbles  
*Takamura, Norimitsu; Araoka, Nobutaka; Kamohara, Seiya; Hino, Yuta; Beppu, Takuya; Otsubo, Takuya; Mizusaki, Masayuki; Hanai, Masahiro; Fukuoka University, Japan (1122)*
- 8B-4 AC Breakdown Characteristics of Mineral Oil with and without N<sub>2</sub> Fine Bubbles  
*Kamohara, Seiya; Takamura, Norimitsu; Araoka, Nobutaka; Hanai, Masahiro; Fukuoka University, Japan (1123)*
- 8B-5 Fabrication of Permittivity Graded Materials ( $\epsilon$ -FGM) by Flexible Mixture Casting Method  
*Ochiai, Kenta<sup>1</sup>; Izu, Atsuhiko<sup>1</sup>; Oishi, Ryota<sup>1</sup>; Kojima, Hiroki<sup>1</sup>; Mitsudome, Hiroshi<sup>2</sup>; Yanase, Hironori<sup>2</sup>; Okamoto, Kenji<sup>2</sup>; Kato, Katsumi<sup>3</sup>; Hayakawa, Naoki<sup>1</sup>; 1: Nagoya University, Japan; 2: Fuji Electric Co., Ltd., Japan; 3: National Institute of Technology, Niihama College, Japan (1129)*
- 8B-6 Breakdown Behavior of Metallized BOPP Film under the DC Superimposed Harmonic Condition  
*Yi, Bosi; Li, Hua; Jiang, Haoyu; Li, Liwei; Li, Lu; Chen, Qiren; Li, Zheng; Zhang, Qin; Lin, Fuchang; Huazhong University of Science and Technology, China (1144)*
- 8B-7 Influence of Dicumyl Peroxide Content on DC Performance of Polyethylene for DC Cables  
*Cao, Liang<sup>1</sup>; Zhong, Lisheng<sup>1</sup>; Li, Ying<sup>1</sup>; Ren, Haiyang<sup>1</sup>; Gao, Jinghui<sup>1</sup>; Chen, Guanghui<sup>1</sup>; Li, Wenpeng<sup>2</sup>; Li, Weikang<sup>2</sup>; Zhang, Chong<sup>2</sup>; 1: Xi'an Jiaotong University, China; 2: Global Energy Interconnection Research Institute Co., Ltd, China (1147)*
- 8B-8 Electrical Breakdown Characteristic of Epoxy/Hollow Silica Composite Material  
*Matsubara, Takayuki; Kawashima, Tomohiro; Hozumi, Naohiro; Murakami, Yoshinobu; Toyohashi University of Technology, Japan (1150)*
- 8B-9 Effect of Temperature and Moisture on Frequency Breakdown Characteristics of Insulation Paper Impregnated by Three-element Mixed Insulation Oil  
*Wang, Qian<sup>1</sup>; Feng, Dawei<sup>2</sup>; Hao, Jian<sup>2</sup>; Liao, Ruijin<sup>2</sup>; Yang, Lijun<sup>2</sup>; Hu, Shihong<sup>3</sup>; Tian, Qianqian<sup>3</sup>; 1: State Grid Chongqing Electric Power CO. LTD. Chongqing Electric Power Research Institute, China; 2: Chongqing University, China; 3: State Grid Sichuan Electric Power CO. LTD. Sichuan Electric Power Research Institute, China (1199)*
- 8B-10 Influence of Cellulosic, Metal Particles and Their Mixture on the DC Breakdown of Natural Ester Developed From Soybean Oil  
*Zhu, Mengzhao; Hao, Jian; Liang, Shuaiwei; Dan, Min; Qin, Wei; Gu, Chao; Chongqing University, China (1212)*
- 8B-11 Influence of low temperature on luminous characteristics of positive streamer in air  
*Tang, Wenxi<sup>1</sup>; Yi, Yong<sup>2</sup>; Mei, Hongwei<sup>1</sup>; Wang, Liming<sup>1</sup>; Shao, Tianying<sup>1</sup>; Wu, Dengjin<sup>1</sup>; 1: Graduate School at Shenzhen, Tsinghua University, Shenzhen, China; 2: Tsinghua-Berkeley Shenzhen Institute, Shenzhen, China (1216)*
- 8B-12 Development of bubbles and breakdown in liquids under Pulsed Electric Fields  
*Zhang, Ruobing; Li, Xin; Wang, Zhiyuan; Graduate School at Shenzhen, Tsinghua University, China (1217)*
- 8B-13 The streamer region in long air gaps – Experiments and modeling  
*Arevalo, Liliana<sup>1</sup>; Wu, Dong<sup>1</sup>; Hettiarachchi, Pasan<sup>2</sup>; Cooray, Vernon<sup>2</sup>; Lobato, Andre<sup>2</sup>; Rahman, Mahbub<sup>2</sup>; Wooi, Chin-Leong<sup>2</sup>; 1: ABB Power Grids HVDC, Sweden; 2: Uppsala University – Department of Engineering Sciences, Sweden (1238)*
- 8B-14 Investigation of Insulating Oils in Presence of Impurities  
*Ghoneim, Sherif Salama Mohamed<sup>1,4</sup>; Taha, Ibrahim Bedir*

Metwally<sup>2,4</sup>; Sabiha, Nehmdoh A.<sup>3,5</sup>; El-Adly, Refaat A.<sup>6</sup>; 1: Electrical department, Faculty of Industrial Education, Suez University, Egypt; 2: Department of electrical power and machines, Faculty of Engineering, Tanta University, Egypt; 3: Faculty of Engineering, Menoufia University, Egypt; 4: College of Engineering, Taif University, Saudi Arabia; 5: Science Stream, Preparatory Year Deanship, Taif University, KSA; 6: College of Science, Taif University, Saudi Arabia (1243)

**8B-15 A Decision Transformer Fault Diagnostics System Based on Dissolved Gas Analysis**

Taha, Ibrahim Bedir Metwally<sup>1,3</sup>; Mansour, Diaa El-Din A.<sup>1</sup>; Ghoneim, Sherif Salama Mohamed<sup>2,3</sup>; Al-Harhi, Mosleh M.<sup>3</sup>; 1: Faculty of Engineering, Tanta University, Egypt; 2: Faculty of Industrial Education, Suez University, Egypt; 3: College of Engineering, Taif University, Saudi Arabia (1244)

**8B-16 Temperature dependent large area breakdown strength of polymeric films**

Li, Zongze<sup>1,2</sup>; Ronzello, JoAnne<sup>2</sup>; Cao, Yang<sup>1,2</sup>; 1: Department of Electrical and Computer Engineering, University of Connecticut, USA; 2: Electrical Insulation Research Center, Institute of Materials Science, University of Connecticut, USA(1287)

**8B-17 Research on Insulation Problems of the Tubular Conductor Cable with Tape Winding Insulation**

Liu, Rui<sup>1</sup>; Ren, Xiang<sup>1</sup>; Ruan, Ling<sup>1</sup>; Zheng, Zhong<sup>2</sup>; Zhu, Sirui<sup>1</sup>; Li, Wenpei<sup>1</sup>; 1: State grid Hubei electric power research institute, China; 2: North China electric power university, China (1323)

**8B-18 Influence of gas pressure on ionization coefficient of nitrogen at 0.5-2.0 kPa**

Wang, Yihang<sup>1</sup>; Cheng, Yi<sup>1</sup>; Wu, Jie<sup>1</sup>; Tu, Youping<sup>1</sup>; Ding, Lijian<sup>2</sup>; Qin, Sichen<sup>1</sup>; 1: North China Electric Power University, China; 2: Hefei University of Technology, China (1328)

**8B-19 Analysis and Discussion on Cracking Discharge Failure of Epoxy Insulating Bushing in GIS Cable Terminal**

Shao, Xianjun<sup>1,2</sup>; He, Wenlin<sup>2</sup>; Li, Wendong<sup>1</sup>; Liu, Haojun<sup>2</sup>; Zhang, Guanjun<sup>1</sup>; 1: Xi'an Jiaotong University, China; 2: Research Institute of State Grid Zhejiang Electric Power Company, China (1329)

**8B-20 Evaluation of Dielectric Strength of Tricyclopentadiene / Silica Microcomposites**

Ookubo, Yusuke<sup>1</sup>; Kozako, Masahiro<sup>1</sup>; Hikita, Masayuki<sup>1</sup>; Kamei, Nobuhito<sup>2</sup>; 1: Kyushu Institute of Technology, Japan; 2: RIMTEC corporation (1388)

**12:30-14:00 Lunch**

**14:00-16:00 Session 9 (Oral) Aging, Pre-breakdown and Breakdown Phenomena**

Chair: Abderrahmane Beroual, University of Lyon, France  
Co-chair: Akiko Kumada, The University of Tokyo, Japan

**9-1 Dielectric and Mechanical Behavior of Thermally Aged EPR/CPE Cable Materials**

Sriraman, Aishwarya<sup>1</sup>; Bowler, Nicola<sup>1</sup>; Glass, S. W. (Bill)<sup>2</sup>; Fifield, Leonard S.<sup>2</sup>; 1: Iowa State University, USA; 2: Pacific Northwest National Laboratory, USA(1247)

**9-2 Ageing State Analysis of Safety-related Cables for Nuclear Power Plants Exposed to Simulated Accident Conditions**

Minakawa, Takefumi<sup>1,2</sup>; Ikeda, Masaaki<sup>1</sup>; Hirai, Naoshi<sup>2</sup>; Ohki, Yoshimichi<sup>2</sup>; 1: Regulatory Standard and Research Department, Secretariat of Nuclear Regulation Authority (S/NRA/R), Japan; 2: Faculty of Science and Engineering, Waseda University, Japan(1136)

**9-3 A Study of Breakdown Properties of HFO Gas under DC and Impulse Voltage**

Lesaint, Olivier<sup>1</sup>; Bonifaci, Nelly<sup>1</sup>; Merini, Hocine<sup>1</sup>; Maladen, Romain<sup>2</sup>; Gentils, François<sup>2</sup>; 1: Grenoble University and CNRS, France; 2: Schneider Electric Company, Grenoble, France (1320)

**9-4 Study on the Preparation and Scratch Repairing of Self-repairing Epoxy Resin**

Wang, Youyuan; Zhang, Zhanxi; Li, Yudong; Chongqing University, China (1316)

**9-5 Correlation between Aging Status and Space Charge Behaviors in Samples Consisting of Oil Immersed Paper and Oil**

Cheng, Chuanhui; Wu, Kai; Wu, Yang; Xi'an Jiaotong University, China (1376)

**9-6 Optimization of insulating systems' lifetime used in low voltage rotating machines. Experimental study on the evolution of the insulation properties of impregnating varnishes with thermal aging**

Fetouhi, Louiza<sup>1,2</sup>; Martinez Vega, Juan<sup>1</sup>; Manfé, Philippe<sup>2</sup>; Malec, david<sup>1</sup>; 1: LAPLACE, University of Toulouse, CNRS, INPT, UPS, France; 2: Moteurs Leroy-Somer, Boulevard Marcelin Leroy, France (1337)

**16:00-16:15 Closing**

Nicola Bowler, Iowa State University, USA

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CEIDP 2019, October 20 to 23, Pacific Northwest National Laboratory, Washington, USA

