

2022 IEEE CEIDP
IEEE CONFERENCE ON ELECTRICAL INSULATION
AND DIELECTRIC PHENOMENA



OCT. 30th-NOV. 2nd, 2022

Hilton Garden Inn Denver Union Station Hotel
1999 Chestnut Pl, Denver, CO 80202, USA.

CONFERENCE PROGRAM



CEIDP at a Glance

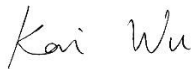
Hours (UTC-6)	Oct. 30th Sunday		Oct. 31st Monday			Nov. 1st Tuesday			Nov. 2nd Wednesday	
7:00	DEIS AdCom Meeting (Blake/Zoom)	Workshop by The IEEE DEIS Outdoor Insulation Technical Committee (Wazee/Zoom)	Breakfast (Pre-Function B- Outside of the ballroom)			Breakfast (Pre-Function B- Outside of the ballroom)			Breakfast (Pre-Function B- Outside of the ballroom)	
7:15			Welcome			2A: Adv. Material s & Nano	2B: Treeing & PD Meas.	2C: Aging & HF Effects	3A: Outdoor Insu. &Flashover	3B: Meas. & BD
7:30			Whitehead Lecture (Ballroom/Zoom)							
7:45			Photo							
8:00			Coffee/Tea Break			Coffee/Tea Break			Gather App	
8:15			Plenary A: Molecul. Simulations, Charge Storage & Transport Steven A. Boggs Young Invest. Award (Ballroom/Zoom)			Plenary D: Partial Discharge Measurements & Treeing (Ballroom/Zoom)			CEIDP Board Meeting (Blake Room)	
8:30			Catered Lunch (Wazee and Wynkoop) IEEE YP Event (Blake/Zoom)			Catered Lunch (Wazee and Wynkoop)				
8:45			Plenary B: Space Charge (Ballroom/Zoom)			Plenary E: Breakdown & Numerical Analysis (Ballroom/Zoom)				
9:00			Coffee/Tea Break			Coffee/Tea Break				
9:15			Plenary C: Aging (Ballroom/Zoom)			Plenary F: Advanced Materials & Nanodielectrics (Ballroom/Zoom)				
9:30			Welcome Reception (Ballroom)			Banquet (Ballroom)				
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13:00	Welcome Reception (Ballroom)			Banquet (Ballroom)			Important Notes: Workshop, Whitehead Memorial Lecture, plenary and closing remarks sessions can be accessed on-line via Zoom. All poster sessions are conducted in a 100% virtual mode, using the Gather App. Zoom can be also accessed via the Gather App. Zoom and Gather App links and passwords will be sent to registered conference participants via ConfTool			
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17:00	Welcome Reception (Ballroom)			Banquet (Ballroom)			Important Notes: Workshop, Whitehead Memorial Lecture, plenary and closing remarks sessions can be accessed on-line via Zoom. All poster sessions are conducted in a 100% virtual mode, using the Gather App. Zoom can be also accessed via the Gather App. Zoom and Gather App links and passwords will be sent to registered conference participants via ConfTool			
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21:00	Welcome Reception (Ballroom)			Banquet (Ballroom)			Important Notes: Workshop, Whitehead Memorial Lecture, plenary and closing remarks sessions can be accessed on-line via Zoom. All poster sessions are conducted in a 100% virtual mode, using the Gather App. Zoom can be also accessed via the Gather App. Zoom and Gather App links and passwords will be sent to registered conference participants via ConfTool			
21:15										
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22:00										

Welcome From the Conference Chair

On behalf of the Conference Committee, I am honored to welcome you to the 2022 IEEE Conference on Electrical Insulation and Dielectric Phenomena (CEIDP) in Denver, CO, USA. The 2022 IEEE CEIDP is fully sponsored by the IEEE Dielectrics and Electrical Insulation Society.

The CEIDP was established within the Division of Engineering and Industrial Research of the National Academy of Sciences–National Research Council in 1920. Despite the evolving challenges of the COVID-19 pandemic since 2020, the conference has continued to annually provide a flagship platform for students, dialecticians, and electrical insulation specialists worldwide for exchanging recent research advances and new trends in the fields of dielectrics and electrical insulating materials. This year, the 2022 IEEE CEIDP features about 150 papers in its proceedings, covering a wide range of topics within the conference scope. In the light of the current travel restrictions put in place worldwide due to the COVID-19 pandemic, the conference continues to be in the hybrid mode, which allows those who cannot travel to the conference in Denver to join the plenary sessions on-line either as presenters or audience. In addition the conference poster sessions are conducted this year in a 100% virtual mode using the Gather App.

I would like to thank all the members of the Executive Committee, the Technical Program Committee and the session chairs/co-chairs for their hard work. I hope all the attendees enjoy the conference program and find the discussions exchanged during the plenary and the poster sessions rewarding and interesting. Hoping for an end to the COVID-19 pandemic, I am looking forward to more prosperous meetings in the following years.



Prof Kai Wu

Chairperson, 2022 IEEE CEIDP

Xi'an Jiaotong University, China

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* Serving 2nd consecutive term (terms limited to 2 in succession)

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George Chen
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Virginie Griseri
Ayman El-Hag
Issouf Fofana
Feipeng Wang
Jun-Wei Zha
Xingming Bian
Zepeng Lv
Yu Gao
Ming Dong
Mona Ghassemi
Muneaki Kurimoto
Roger Schurch
Toshihiro Takahashi
Nikola Chalachkanov
Yazid Hadjadj
Leo S. Fifield
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Enis Tuncer

G&W Electric, USA
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University of Toulouse, LAPLACE, France
Tsinghua University, China
Wuhan University, China
National Research Council, Canada
Texas Instruments Inc., USA

The Whitehead Memorial Lecture

The Whitehead Memorial Lecture is named in honor of Dr. John Boswell Whitehead, a pioneer in electrical insulation and dielectrics and a long-time contributor to the CEIDP. The Conference opens each year with the lecture and it is the keynote session of the Conference. The 2022 Whitehead Memorial Lecture will be given by Prof. Nick Quirke, Imperial College London, UK.

Prof. Nick Quirke short Bio: Nick Quirke is Professor Emeritus of Chemical Physics at Imperial College, London. His group conducted theoretical research in the general area of nanomaterials with particular interest in their interaction with biological interfaces and with polymeric insulators. This fundamental research finds application in toxicology and in power engineering. He is a Fellow of the Royal Society of Chemistry, Editor-in-Chief of the international Journals, Molecular Simulation, and the Journal of Experimental Nanoscience. He received the 1998 Royal Society of Chemistry Medal for Thermodynamics and was Royal Society / Kan Tong Po Professor at the University of Hong Kong for 2003/2004. He was awarded the 2006 NSTI Fellow Award for Outstanding Contributions in Advancing Nanotechnology and in 2013 a Yangtze River professorship ship at Xi'an Jiaotong University and was appointed adjunct professor at BUCT. His career has included leadership positions in both academia and industry. He was Principal Research Associate at BP. From 2006 to 2011 he was Vice President and Principal of engineering and science, University College Dublin.

Registration

All conference attendees must register in the conference online via [Registration – CEIDP 2022](#). The Registration fee table is shown below. The fee for an additional paper submission is \$400/ each additional submission (allowed only once per presenter), and the fee for extra pages is \$100 per page, up to a limit of 4 extra pages. Pre-registration is encouraged but not required. There is a 35 USD fee for all cancelled conference registrations, and please note that there will be no refunds after October 15, 2022.

Registration Mode	All Fees in USD	Early Fee Deadline: 09 / 30 /22	Regular Fee Deadline: 10 / 27 /22	On-Site Fee	Inclusions
In-Person	IEEE Society Member	610	660	690	Proceedings Download; Technical Sessions; Reception, Banquet, Lunch and Coffee Break
	IEEE Member	660	770	800	
	Non Member	790	920	950	
	IEEE Life Member	450	500	530	
	IEEE Student Member	450	500	530	
	Student Non Member	540	600	630	
	Workshop	100	100	N/A	
	Companion/Guest	150	250	300	Welcome Reception and Banquet Only
Remote/Virtual	Remote - IEEE Society Member	488	528	N/A	Proceedings download
	Remote - IEEE Member	528	616	N/A	
	Remote - Non Member	632	736	N/A	
	Remote - IEEE Life Member	360	400	N/A	
	Remote - IEEE Student Member	360	400	N/A	
	Student Non Member	432	480	N/A	
	Workshop	100	100	100	

Plenary Presentations

A total of 20 minutes is allocated for each plenary presentation, including up to 5 minutes for questions. Presenters can use the preferred presentation house style by their institutions for plenary presentations and provide either a PPT or PDF file of these presentations. Presentation files need to be uploaded online no later than October 7th, 2022 in order to enable the session chairs to upload the presentation slides via Zoom, in case there are technical issues preventing the authors at the day of their presentations to upload their presentation files in Zoom. Only session chairs and co-chairs will have access to presentation files, and the files will be deleted after the conference.

In-Person Participants: Plenary sessions will be typically open 15-30 minutes before the start of the plenary session in order to allow session chairs to add the presentation files to the presenting machine in the session and to verify that microphones and/or the camera are working properly for remote presenters in Zoom.

Remote Participants: In order to save bandwidth and to ensure a smooth session, remote participants will be muted when logging in. After logging in, please make sure that you are muted and that your camera is disabled. If you have a question to the presenter, please use the chat function, and session chairs will then address you and enable you to use your microphone to ask your question. Please start your question by stating your name and affiliation. In case you have a malfunctioning microphone, you can also ask your question in the chat, and then your question will be read out by one of the session chairs. Questions can be written in the chat during the presentation, so you do not need to wait for the presentation to end for questions.

Note: Zoom link and password will be sent to the registered participants of the conference via ConfTool in due course.

Poster Presentations (Gather App)

The poster sessions are conducted using the Gather App. Moving with your personal avatar across the virtual map of the conference event in the Gather App, you can participate in the poster sessions in real time and without the need to print the poster. Each poster session will be held in real time as scheduled and has a dedicated virtual room, where each author has a virtual poster panel with their poster displayed. The poster presenters should find their poster booth as indicated at the bottom left of each virtual poster booth. Other participants will be able to access the virtual poster rooms, approaching the posters, view them and interact with the poster presenters via video camera and computer audio. Papers will be published in the conference proceedings only if at least one of the authors is present near the poster for the entire time of the session. It will be up to the session chairs to verify the presence of the authors.

Authors a poster presentation papers have to upload their poster as an A0 png or jpeg image (width: 841mm height: 1189 mm) in ConfTool by October 7, 2022, with a resolution that is not less than 60 pixel/cm and a maximum size of 5 Mb.

Note: Gather App link and password will be sent to the registered participants of the conference via ConfTool in due course.

IEEE Young Professionals Event

An event for The IEEE Young Professionals will be organized during the 2022 IEEE CEIDP on Monday Oct 31st during the lunch break, where the next-generation scientists and engineers will have the opportunity to hear from the 2022 Whitehead Memorial Lecturer, Prof. Nick Quirke about challenges and opportunities in working in the areas of high voltage, dielectrics and electrical insulation. The event will also feature fruitful discussions among senior scientists, mentors, leaders, young professionals and the students attending the conference in person or via Zoom.

Denver, Colorado, USA

COVID-19- related information for Denver, CO can be found at this link [COVID-19 Information - City and County of Denver \(denvergov.org\)](#).

Information about thing-to-do in Denver, CO can be found at this link [Things to Do in Denver, Colorado | VISIT DENVER](#).

Denver International Airport

The Denver International Airport offers direct flights to/from a number of international destinations including Tokyo Narita and 6 different airports in Europe. More information is available at this link [Welcome to Denver International Airport | Denver International Airport \(flydenver.com\)](#).

Conference Hotel

IEEE CEIDP 2022 will be hosted in the Hilton Garden Inn Denver Union Station Hotel located in downtown Denver ([Hilton Garden Inn Denver Union Station Hotel](#)). The Hotel address is

Hilton Garden Inn Denver Union Station Hotel, 1999 Chestnut Pl, Denver, CO 80202, USA.

One possibility to reach the conference hotel from the Denver International Airport is to ride the A line (the only train to/from the airport) all the way (6 stops, 37 minutes) to the end of the line—ends at Union Station in downtown Denver. The hotel is about a 640-meter walk from Union Station. Information about the location of the Hilton Garden Inn Union Station hotel can be found in this link [Directions to Hilton Garden Inn Denver Union Station Hotel](#).

The 2022 IEEE CEIDP has secured a discounted conference rate for rooms booked by the conference attendees, i.e \$159 per night (single/double occupancy). The direct online link for booking in the conference hotel at the conference rate is available at the Venue/Travel page of the conference website ([Venue / Travel – CEIDP 2022](#)).

The floor plan of the conference hotel, Hilton Garden Inn Denver Union Station Hotel, is illustrated below.

Breakfast: Pre-Function B- Outside of the ballroom

Catered Lunches: Wazee and Wynkoop

IEEE Young Professionals Event: Blake

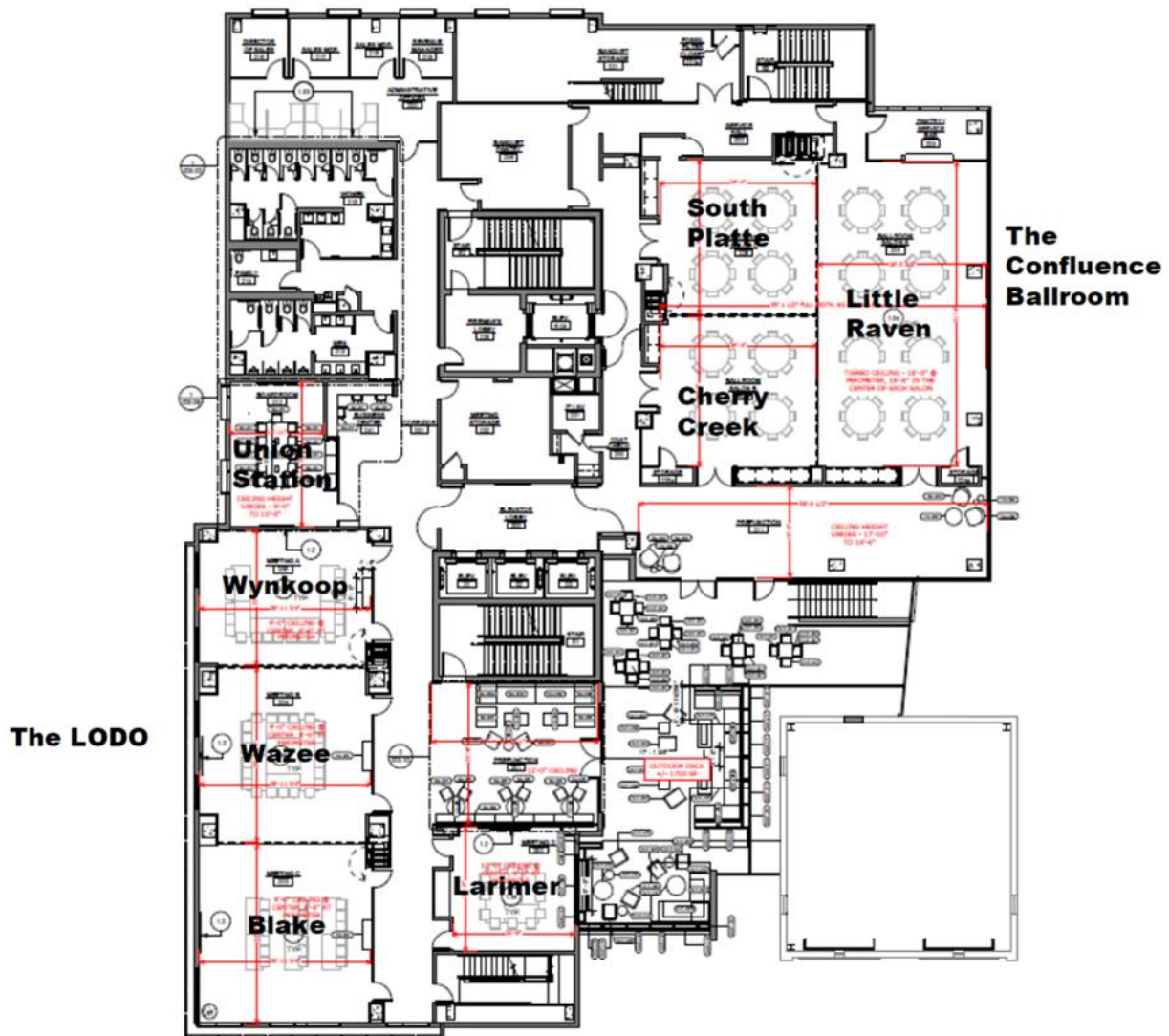
Plenary and Closing Remarks Sessions: Conference Ballroom and Zoom

Banquet: Conference Ballroom

Poster Session: Virtual (Gather App)

Workshop: Wazee and Zoom

IEEE DEIS AdCom and CEIDP Board Meetings: Blake Room and Zoom



IEEE DEIS Technical Meetings

IEEE DEIS technical committee chairs or other individuals interested in arranging auxiliary meetings for working groups, technical committees or other related organizations during future CEIDP meetings should contact the Technical Program Committee Chair or the Conference Chair.

Workshop

The workshop highlights numerous research themes in the area of outdoor insulation, which are service experience and advances in materials, testing and condition monitoring. The workshop is organized by the Outdoor Insulation Technical Committee of the IEEE Dielectrics and Electrical Insulation Society, and the

talks in the workshop are delivered by speakers with wide spectrum of experience in the field of outdoor insulation from both the academia and the industry in person in the workshop venue or via Zoom. For more information about the outdoor insulation workshop of the 2022 IEEE CEIDP, please contact the workshop organizer Dr. Refat Atef Ghunem at Refat.Ghunem@nrc-cnrc.gc.ca or refer to the workshop page in the conference website. Individuals interested in proposing a workshop for future CEIDP meetings are invited to contact the Technical Program Committee Chair or the Conference Chair.

2022 Annual Report

One copy of the 2022 Annual Report in USB format will be provided with registration. While supplies last, additional copies may be obtained during the conference at a cost of US\$50 each. Following the conference, the annual report will be available from:

IEEE Service Center

Single Publication Sales Department

445 Hoes Lane

Piscataway, NJ 08854, USA

Tel: 800-675-4333

Important Note: Hours in Mountain Daytime Saving Time (UTC-6)

Monday October 31st, 2022

8:00- 8:15 am Welcome from the Conference Chair

8:15- 9:30 am Whitehead Lecture

The Role of Molecular Simulation in Understanding Electrical Insulation and Dielectric Phenomena

By Prof. Nick Quirke, Imperial College London, UK

9:30- 10:00 am Conference Photo

10:00-10:30 am Coffee/Team Break

10:30 am-12:30 pm Plenary A, Molecular Simulations, Charge Storage and Transport, Ballroom

Chair: Davide Fabiani, DEI-University of Bologna, Italy

Co-Chair: George Chen, University of Southampton, UK

A1- Introducing Materials Informatics to Dielectrics Design (10:30-11:10 am)

By Dr. Masahiro Sato, The University of Tokyo, Japan

Steven A. Boggs Young Investigator Award Presentation

A2- Effects of DMP-30 Contents on Molecular Orbital Energy Level Distribution of Anhydride Cured Epoxy Resin

Jin Li¹, Pengxiang Guo², Qinghua Tang³, Guanfei Zhao², Xiaoxiao Kong¹ and Boxue Du¹; 1: School of Electrical and Information Engineering, Tianjin University, China; 2: Weihai Company of State Grid Shandong Electric Power Company; 3: State Grid Tianjin Electric Power Research Institute, China

A3- Comparison of Charge Mobility in Insulating Oil and Oil-immersed Paper

Lu Gao, Yang Wu, Jiaxin Chen, Zepeng Lv and Kai Wu; State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, China

A4- Electric Field and Temperature Characteristics of Accumulated Charge Amount in Several Polymeric Insulating Materials Using Q(t) Method and Quantum Chemical Calculation

Hiroaki Uehara¹, Tatsuki Okamoto¹, Shinya Iwata², Yasuo Sekii³ and Tatsuo Takada⁴; 1: Kanto Gakuin University, Japan; 2: Osaka Research Institute of Industrial Science and Technology, Japan; 3: Sekii PE Laboratory; 4: Tokyo City University, Japan

A5- Electrical breakdown and charge dynamics of Polyethylene terephthalate films

Jierui Zhou^{1,2}, Peinan Zhou^{2,3}, Chao Wu^{1,2}, Yifei Wang² and Yang Cao^{1,2}; 1: Department of Electrical and Computer Engineering, University of Connecticut, USA; 2: Electrical Insulation Research Center, Institute of Materials Science, University of Connecticut, USA; 3: Department of Material Science Engineering, University of Connecticut, USA

12:30- 2:00 pm Catered Lunch, Wynkoop and Wazee and IEEE Young Professionals Event, Blake

2:00- 4:00 pm Plenary B, Space Charge, Ballroom

Chair: Jerome Castellon, University of Montpellier, France

Co-Chair: Virginie Griseri, LAPLACE- University of Toulouse, France

B1- Space charge behavior of quantum dots filled polymeric resin matrices 406 20-23

Mariani, Daniele, Selleri Giacomo, Suraci Simone Vincenzo, Seri Paolo and Fabiani, Davide; Alma Mater Studiorum University of Bologna, Italy

B2- Influence of Irganox 1010 on Space Charge Behavior in iPP Thermal-Oxidative Ageing 421 24-27

Xiwen Wu, Thomas Andritsch and George Chen; University of Southampton, UK

B3- Space Charge Dynamics in Oil-Impregnated Kraft Paper and its Relation to Aged States of Oil 475 28-31

Chinmay Y. Jani¹ and Santosh C. Vora²; 1: Sardar Vallabhbhai Patel Institute of Technology, India; 2: Institute of Technology, Nirma University, Gujarat, India

B4- Estimation Accuracy of Electric Field in Cable-Insulating Wall Based on Space Charge Measurement 336 32-35

Norikazu Fuse¹, Shosuke Morita¹, Satoru Miyazaki¹, Toshihiro Takahashi¹ and Naohiro Hozumi²; 1: Central Research Institute of Electric Power Industry, Japan; 2: Toyohashi University of Technology, Japan

B5- Round Robin Tests of Electron Irradiated Polymers via Pulsed Electroacoustic Measurements 412 36-40

Zachary Gibson¹, JR Dennison¹ and Virginie Griseri²; 1: Materials Physics Group, Physics Dept., Utah State University, Logan, UT, USA; 2: Laboratoire Plasma et Conversion d'Energie, Université Paul Sabatier, Toulouse, France

B6- Analysis on the impact of additives on space charge behavior of thermally aged XLPE plaques 334 41-44

Simone Vincenzo Suraci, C. Spinazzola and Davide Fabiani; LIMES – Department of Electrical, Electronic and Information Engineering – University of Bologna, Italy

4:00- 4:30 pm Coffee/Team Break

4:30-6:50 pm Plenary C, Aging, Ballroom

Chair: Ayman El-Hag, University of Waterloo, Canada

Co-Chair: Issouf Fofana University of Quebec at Chicoutimi (UQAC), Canada

C1- Degradation of a FR-EPDM Cable Removed from a Nuclear Power Plant

Yoshimichi Ohki¹, Naoshi Hirai¹, Kosuke Sato² and Yasuhiro Tanaka²; 1: Waseda University; 2: Tokyo City University, Japan

C2- Partial discharge inception voltage in cables: influence of type of defect, supply frequency and voltage waveshape

Paolo Seri¹, Grazia Berardi², Marco Albertini², Stefano Franchi Bononi², Jacob Haney³, Koksai Tonyali³, Gian Carlo Montanari⁴; 1: University of Bologna, Italy; 2: Prysmian SpA, Italy; 3: Prysmian Cables and Systems LLC, USA; 4: Florida State University, USA

C3- A Power Cable Thermal Aging Insulation Resistance Degradation Model

XUFEI GE, Martin Given, Brian.G Stewart; University of Strathclyde, UK

C4- Temperature Dependence of FDR Response for Thermally Aged Low-Voltage Cables

Aishwarya Sriraman, Leonard S. Fifield, S.W. Glass, Mychal Spencer, Matthew S. Prowant, Anthony Guzman; Pacific Northwest National Laboratory, USA

C5- Accelerated Aging Study of Transformer Paper-oil Insulation under Repetitive Transient Conditions

Anurag Anand Devadiga, Shesha H. Jayaram; University of Waterloo, Canada

C6- A Modified Simulation Model Using FEM for Monitoring Transformer Insulation Health Under Non Uniform Aging

Nisha Thanua, Ganesh B. Kumbhar; Indian Institute of Technology Roorkee, India

C7-An integrated physics-based framework to predict insulation degradation under low and high-voltage electric field

Miad Yazdani¹, Robert Hebner², Wenping Zhao¹, Chuck Lents¹; 1: Raytheon Technologies Research Center, USA; 2: University of Texas Austin

8:00- 10:00 pm Poster 1A Numerical Analysis and Simulation of Dielectrics, Virtual (Gather App)

Chair: Feipeng Wang, Chongqing University, China

Co-Chair: Jun-Wei Zha, University of Science and Technology Beijing, China

1A1- Dynamic Characteristics of Charged Metal Particles in Insulating Oil under Multi-physics Coupling

Peng Wang, Juntao Zhao, Song Zhu, Jianxin Xu and Bo He; Xi'an Jiaotong University, China

1A2-Influence of Conductivity Parameters of EPDM on Electric Field Distribution of Insulating Interface in HVDC Cable Joints

Minghao Dai¹, Wenpeng Li^{1,2}, Qiang Xu³, Tianyu Yang³, Bo Qiao², Wei Zhao¹ and Lisheng Zhong¹; 1: State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, Xi'an, China; 2: State Key Laboratory of Advanced Power Transmission Technology, State Grid Smart Grid Research Institute Co.LTD. Beijing, China; 3: State Grid Shanghai Municipal Electric Power Company, Shanghai, China.

1A3- Simulation of Electrical Field Distribution of HVDC and EHVDC Cable during Load Cycles in Type Test

Xiao Gu and Tao Zhu; Shanghai National Center of Testing and Inspection for Electric Cable and Wire Co., Ltd., China

1A4- Molecular Simulation on Dielectric and Mechanical Properties of Epoxy-Polyetheramine Resin

Sijia Zhu, Mingbo Liu, Hang Yuan, Huijun Zhao, Peng Liu and Zongren Peng; State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, China

1A5-Temperature Prediction of Transformer High-Voltage Bushing Based on PSO-LSTM

Didi Liu¹, Yang Wang¹, Yuchan Zhang¹, Yuchan Wang¹, Huiqian Liu¹, Qingdong Zhu² and Bo Zhang¹; 1: Xi'an Polytechnic University, Xi'an, China; 2: State Grid Shandong Electric Power Company Electric Power Research Institute, China

1A6-Electrostatic Lubricant Filter Design Study

Shabaz Khan¹, Nicholas Dyrstad Cincotta¹, Junior Nasah¹, Ajit Bhat¹, James Kevin Rickson²

and Michael Mann¹; 1: Institute for Energy Studies, University of North Dakota; 2: ELF Technology, LLC, USA

1A7- Simulation Research on Photoelectric Parameters of Optical Voltage Sensors with ZnS Doped Dielectric Materials

Siqi Chen¹, Wen Qi¹, Miao Liu¹, Jia Qu², Luxing Zhao³, Boyang Shen⁴ and Xingming Bian¹; 1: North China Electric Power University, China; 2: State Grid Tibet Electric Power Co., Ltd. Naqu Power Supply Company, Naqu 852000, China; 3: Tibet Yangbajing High Altitude Electrical Safety and Electromagnetic Environment National Observation and Research Station, Lhasa 851500, China; 4: Electrical Engineering Division, University of Cambridge, Cambridge CB3 0FA, UK

1A8- 3D Frequency Domain Reflectometry Digital Twin of an Electrical Cable: A First Glance

Mychal Phillip Spencer, Aishwarya Sriraman, Bill Glass and Leonard S. Fifield; Pacific Northwest National Laboratory, USA

1A9- Molecular dynamics study on the diffusion behavior of furan molecules at oil-paper interface

Manqing Zhao¹, Yuanyang Ren², Qiankai Zhang¹, Jianfei Li¹, Yang Wang¹ and Kai Wu²; 1: Xi'an Polytechnic University, China; 2: Xi'an Jiaotong University, Xi'an 710049, Shaanxi, China

1A10-Study on the Numerical Simulation of Rime Accretion under DC Electric Field

Tianqi Yu¹, Liming Wang¹, Fanghui Yin¹, Xingliang Jiang² and Masoud Farzaneh³; 1: Shenzhen International Graduate School, Tsinghua University, China; 2: Chongqing University, China; 3: University of Quebec at Chicoutimi, Canada

1A11-Simulating dielectric breakdown based on Maxwell's equations with inhomogeneous conductivity

Qi Wang¹, Yan Yang¹, Malvern Yap¹, Wen Kwang Chern² and Zhong Chen^{1,3}; 1: SP Group – NTU Joint Laboratory, School of Electrical & Electronic Engineering Nanyang Technological University,

639798; 2: Singapore Power Group, 349277; 3: School of Materials Science and Engineering, Nanyang Technological University, 639798, Singapore

1A12-Transversely Isotropic Model of the Stacked Iron Core and its Application in the Design of the Low-Noise Power Transformers

Huadong Liu¹, Youliang Sun², Dong Wang³, Fan Zhang¹, Zhe Zhuang¹, Shengchang Ji¹; 1: State Key Lab of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, Xi'an 710049, Chin; 2: State Grid Henan Electric Power Company; 3: Shandong Electrical Engineering&Equipment Group Co., Ltd.

1A13- Analysis of Temperature Rise Characteristics and Current Carrying Capacity of Overhead Conductor

Xi YANG^{1,2}, Shenglong ZHU³, Shaorui QIN³, Xuhai ZHAN⁴, Lijuan ZHU¹; 1: Anhui Province Key Laboratory of Renewable Energy Utilization and Energy Saving (Hefei University of Technology), China; 2: State Key Laboratory of Electrical Insulation and Power Equipment(Xi'an Jiaotong University); 3: State Grid Anhui Electric Power Research Institute; 4: State Grid Anhui Electric Power CO.,LTD, China

1A14- Simulation of interface thermal properties and optimization methods of Al₂O₃ / EP composites

Xiaofeng Xue¹, Xupeng Song¹, Xin Liu², Liufang Wang², Zhenyu Guo², Wen Shi², Xingming Bian¹; 1: North China Electric Power University, China; 2: State Grid Anhui Ultra High Voltage Company; No.397, Tongcheng South Road, Baohe District, Hefei , Anhui, China; 230000.

8:00- 10:00 pm Poster 1B, Polarization and Dielectrics for Energy Storage and Electrification of Transport, Gather App

Chair: Xingming Bian, North China Electric Power University, China

Co-Chair: Zepeng Lv, Xi'an Jiaotong University, China

1B1- Insulation Failure Mechanism of Dielectric Film for Power Capacitor in Strong Electromagnetic Field

Haoliang Liu, B. X. Du, Meng Xiao and Ke Chen; Tianjin University, China

1B2- Insulation Performance of Polypropylene Capacitor Films with Different Biaxial Orientation Ratios

Boxue Du, Yongping Hou, Meng Xiao, Haolian Liu; Tianjin University, China

1B3- Effect of Crystalline Morphology of Long-Chain Branched Polypropylene for Film Capacitors on Dielectric Properties

Chong Zhang¹, Huize Cui¹, Mengdie Zhang², Meng Xiao², Boxue Du², Shaowei Guo¹, Zhaoliang Xing¹, Xiyang Dai¹ and Fei Li¹; 1: State Grid Smart Grid Research Institute co., Ltd., State Key Laboratory of Advanced Power Transmission Technology, Beijing 102209, China; 2: School of Electrical and Information Engineering, Tianjin University, Tianjin 300072, China

1B4- Study of the Dielectric Frequency Response of Mineral Oil on addition of Carboxylic Acids

Rohith Sangineni, Niharika Baruah, Sisir Kumar Nayak; Indian Institute of Technology Guwahati, India

1B5-High-temperature polarization analysis of polyethylene and polyethylene-semicon bilayers

Roger Walker¹, Amira Meddeb¹, Steven Perini¹, Eugene Furman¹, Tim Person², Saurav Sengupta², Hunter Woodward², Ramakrishnan Rajagopalan¹ and Michael Lanagan¹; 1: Penn State, USA; 2: Dow Chemical, USA

1B6- Design of a Cable System for a High-Power Density MVDC Aircraft Electric Power System

Arian Azizi¹, Mona Ghassemi¹ and Jane Lehr²; 1: Department of Electrical and Computer Engineering, University of Texas at Dallas, USA; 2: Department of Electrical and Computer Engineering, University of New Mexico, USA

1B7- Understanding the Influence of Aerospace Operating Environments on Electrical Treeing Phenomenon

Kerry Lynn Davis-Amendola^{1,2,3}, Mohamadreza Arab Baferani^{1,2,3} and Yang Cao^{1,2,3}; 1: University of Connecticut, USA; 2: The Institute of Materials Science; 3: Electrical Insulation Research Center, USA

1B8- Space Charge Study on Printed Circuit Board Substrates for High Voltage Applications

Mohamadreza Arab Baferani, Kerry Davis-Amendola and Yang Cao; Electrical Insulation Research Center, Institute of Materials Science, University of Connecticut, USA

1B9- Research on the polyimide aerogel a light-weight insulating material with high dielectric strength

Bo Song, Ming Ren, Yizhuo Hu, Yue Wang and Ming Dong; Xi'an Jiaotong University, China

1B10- Investigation on AC Dielectric and Breakdown Properties of Fluorinert Liquid-Impregnated Insulation Paper

Lejia Song, Liming Wang and Fanghui Yin; Tsinghua University, China

1B11- Electrical Properties of Epoxy Resin after Thermal Aging under High Humidity

Yan Yang^{1,3}, Jielin Ma¹, Malvern Yap¹, Qi Wang¹, Wen Kwang Chern², Yi Shyh Eddy Foo¹ and Zhong Chen⁴; 1: School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore; 2: Singapore Power Group, Singapore; 3: School of Electrical Engineering, Southwest Jiaotong University, Chengdu, China; 4: School of Materials Science and Engineering, Nanyang Technological University, Singapore

1B12- Self-healing Characteristics of Metallized Film Capacitor under DC and AC Superimposed Voltage with Harmonics

Linzi Zheng, Lingyu Zhu, Junjie Liu, Zhenguo Di and Shengchang Ji; State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, Xi'an, China

1B13- Enhanced Breakdown Strength of Polypropylene Film for Capacitor by Deashing Method

Boxue Du, Jianhang Zhang, Meng Xiao, Haoliang Liu and Ke Chen; Tianjin University, China

1B14- Improvement of Breakdown Performance of Long-chain Branched Polypropylene for Film Capacitors Based on Crystallization Control

Zhaoliang Xing¹, Shaowei Guo¹, Mengdie Zhang², Meng Xiao², Boxue Du², Chong Zhang², Huize Cui¹, Xiying Dai¹, Fei Li¹; 1: State Grid Smart Grid Research Institute co., Ltd., State Key Laboratory of Advanced Power Transmission Technology Beijing 102209, China; 2: School of Electrical and Information Engineering, Tianjin University Tianjin 300072, China

8:00- 10:00 pm Poster 1C Space Charge and Measurement Techniques, Gather App

Chair: Yu Gao, Tianjin University, China

Co-Chair: Ming Dong, Xi'an Jiaotong University, China

1C1- An Integrated Sensor with SiP Chip for Bushing Partial Discharge Monitoring of UHV Transformer

Xianjun Shao¹, Yuhui Lv², Xiaoxin Chen¹, Jiangyang Zhan¹, Haibao Mu²; 1: State Grid Zhejiang Electric Power Research Institute, Hangzhou, Zhejiang, 310014, China; 2: State Key Lab of Electrical Insulation and Power Equipment, School of Electrical Engineering, Xi'an Jiaotong University, Xi'an, Shaanxi, 710049, China

1C2- Low-cost impedance analyzer and IDC sensors: an imperfect tool for dielectric condition monitoring

Ioana Preda¹, Marco Collauti¹, Arnaud Pernet², Liming Zeng²; 1: iPrint, University of Applied Sciences and Arts of Western Switzerland, HEIA Fribourg, Switzerland; 2: Ecole de Changins, University of Applied Sciences and Arts of Western Switzerland, Changins, Switzerland

1C3- In situ Measurement of Capacitors under High Hydrostatic Pressure

Marius Bekker¹, Petrus Jacobus Pieterse¹, Dirk Uhrlandt²; 1: University of Rostock, Germany; 2:

Leibniz Institute for Plasma Research and Technology, Germany

1C4- Vibration Characteristics of $\pm$ 800kV Converter Transformer Under No-load Condition

Yao Yuan¹, Menghao Qian², Linjie Zhao¹, Fanghui Yin², Liming Wang²; 1: Electric Power Research Institute of China Southern Grid; 2: Tsinghua University, China

1C5- Evidence of Partial Discharges in the Dielectric Liquid using Electro-Optic Probes

Somya Anand^{1,2}, Eric Vagnon^{1,2}, Martin Guillet²; 1: Univ Lyon, Ecole Centrale de Lyon, INSA Lyon Université Lyon 1, CNRS, Ampère, UMR5005; 2: SuperGrid Institute, France

1C6- Effects of Volatile Compounds on Breakdown Field Strength Measurements of Polymers

Megan Loveland DeWaal, JR Dennison; Utah State University, USA

1C7- Applicability of Methanol as a Solid Insulation Ageing Indicator in Retrofilled Transformers

Anupam Dixit¹, Muhammad Daghrach²; 1: University of Queensland, Australia; 2: M&I Materials, Manchester, UK

1C8- Gas production characteristics of natural ester insulating oil under surface partial discharge

Qing Li, Ming Dong, Wangzeyu Liu, Qinghua Ma; Xi'an Jiaotong University, China

1C9- Method for fast Isothermal Surface Potential Decay measurements

Daniele Mariani, Simone Vincenzo Suraci, Davide Fabiani, Paolo Seri; Alma Mater Studiorum University of Bologna, Italy

1C10- Crystalline Morphology Effects on Space Charge Accumulation in Polypropylene under DC Voltage

Luming Zhou, George Chen; Tony Davies High Voltage Laboratory, University of Southampton, UK

1C11- Effect of Thermal Pulse on Space Charge Accumulation in LDPE under DC Voltage

Bingjie Wang, Zepeng Lv, Yuntong Ma, Jinyang Peng, Chen Zhang, Kai Wu, Yonghong Cheng; State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, Xi'an, China

1C12- The Effect of Oil Flow State on The Leakage Current of Oil-Paper Insulation

Chunyang Zhang, Kai Wu, Zepeng Lv, Xiaoning Kang, Yifei He, Jiaxin Chen, Yuntong Ma, Yang Wu; Xi'an Jiaotong University, China

1C13- Space Charge Research on Epoxy Resin Under Low and Large Thermal Gradient

Jiaxin Chen, Bingjie Wang, Zepeng Lv, Kai Wu; Xi'an Jiaotong University, China

1C14- Development of the space charge measurement system for high temperature using MEMS-PZT

Miho Kobayashi¹, Kosuke Sato¹, Hiroaki Miyake¹, Yasuhiro Tanaka¹ and Kensuke Kanda²; 1: Tokyo city university, Japan; 2: University of Hyogo, Japan

Tuesday November 1st, 2022

8:00- 10:00 pm Poster 2A Advanced Materials and Nanodielectrics, Gather App

Chair: Mona Ghassemi, The University of Texas at Dallas, USA

Co-Chair: Muneaki Kurimoto, Nagoya University, Japan

2A1- Research on the Correlation Between DC Electrical Properties and By-product Content of XLPE Insulation for HVDC Cable

Wenpeng Li^{1,2}, Jinghui Gao, Lisheng Zhong, Fei Li, Ying Li, Zhuoyuan Shen; 1: State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, China; 2: State Grid Smart Grid Research Institute Co.Ltd

2A2- Breakdown Strengthen and Electrical Tree in Homo- Crosslinked-Polyethylene Bilayer

Xiaoning Shi¹, Wenpeng Li¹, Meng Zhang², Xin Chen¹, Chong Zhang¹, Wei Zhao², Lisheng Zhong², Jinghui Gao²; 1: State Key Laboratory of Advanced Power Transmission Technology, Beijing, China; 2: State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, China

2A3- Charge Dissipation Performance of Epoxy Composites Filled With Graphitic Carbon Nitride Nanosheets

Yu Deng¹, Xiaoxi Quan², Yan Zhou², Yijun Du¹, Liang Tian¹, Xingming Bian², Shaojian He², Jun Lin²; 1: Tibet Yangbajing High Altitude Electrical Safety and Electromagnetic Environment National Observation and Research Station; 2: North China Electric Power University, China

2A4- Electroluminescence Characteristics of Epoxy/TiO₂ Nanocomposites

Motoshi Hirai¹, Muneaki Kurimoto¹, Kazuyuki Tohyama², Toru Sawada³, Shigeyoshi Yoshida³, Takahiro Umemoto³, Hirotaka Muto³; 1: Nagoya university, Japan; 2: Numazu College, Japan; 3: Mitsubishi Electric Corporation, Japan

2A5- Characterization of piezoelectric nanofibers for energy harvesting applications

GIACOMO SELLERI¹, LEONARDO GASPERINI¹, MICHELE ZANONI², FRANCESCO DEPALMA¹, CHIARA GUALANDI², DAVIDE FABIANI¹; 1: Department of Electrical Engineering, University of Bologna; 2: Department of Chemistry "Giacomo Ciamician", University of Bologna, Italy

2A6- Enhancement on Temperature Stability of Piezoelectricity of P(VDF-TrFE) via Blending

Xiaoyu Ji¹, Yongbin Liu¹, Ni Yuan², Baofeng Xi¹, Jinghui Gao¹, Lisheng Zhong¹; 1: State key laboratory of electrical insulation and power equipment, Xi'an Jiaotong University, Xi'an, China; 2: Xi'an High Voltage Apparatus Research Institute Co., Ltd., Xi'an, China

2A7- Natural Ester Blended with Dielectric Nanoparticles: a Promising Solution to Sustainable Development Threat

Samson Okikiola OPARANTI¹, Abdelghaffar Amoka Abdelmalik²; 1: Université du Québec à Chicoutimi, Canada; 2: Ahmadu Bello University, Nigeria

2A8- The Effects of Common Inorganic Fillers on the Conductivity of Spacecraft Polymers

Allen Andersen, Nelson Green, Qian Nataly Chen; Jet Propulsion Laboratory, California Institute of Technology, USA

2A9- Study on Synergistic Improvement of Epoxy Resin Properties by Liquid Rubber and Nano Alumina

Chuang Wang, Mu Qiao, Chi Chen, Qingqing Gao, Yuwei Fu, Yifan Zhang, Bing Luo, Mingli Fu; Xi'an University of Technology, China

2A10- The Improvement in electrical properties of RTV Silicone Rubber by the Introduction of TiO₂ Nanocomposite

Wenxin Gao¹, Jingrui Zhang¹, Menggen Wei¹, Dai Wan², Yang Wang¹, Yan Du¹; 1: Xi'an Polytechnic University; 2: State Grid Hunan Electric Power Company Limited Research Institute, Changsha, China

2A11- Compatibility Test of Coatings with Natural Ester at Elevated Temperature for Transformers

Qingdan Huang, Haoyong Song, Ziyong Li, Wei Wang, Huihong Huang; Guangzhou Power Supply Bureau of China Southern Power Grid Co. Ltd, China

2A12- Effect of BN Nanosheet Orientation on Thermal Conductivity and Insulation Properties of BN/Epoxy Resin Composite 466 301-304

Shijie Bi, Zhe Li, Gehao Sheng; Shanghai Jiao Tong University, China

8:00- 10:00 am Poster 2B Treeing and Partial Discharge Measurements, Gather App

Cahir: Roger Schurch, Universidad Tecnica Federico Santa Maria, Chile

Co-Chair: Toshihiro Takahashi, Central Research Institute of Electric Power Industry, Japan

2B1- Assessing One-vs-All 1D-CNN Classifiers for Multi-Label Classification of Partial Discharge Waveforms in 3D-Printed Dielectric Samples with Different Void Sizes

Sara Mantach¹, Ahmed Ashraf¹, Puneet Gill¹, Derek Oliver^{1,2}, Behzad Kordi¹; 1: Electrical and Computer Engineering, University of Manitoba; 2: Manitoba Institute for Materials, University of Manitoba, Winnipeg, MB, Canada

2B2- Time Delay Estimation Algorithm of Partial Discharge Ultrasound Signal Based on Wavelet Transform Image Convolution

Yi Li¹, Qinghua Ma¹, Bin Wang¹, Ming Dong¹, Lemeng Zhang², Junhui Peng²; 1: Xi'an Jiaotong Univ., China; 2: China Railway Signal & Communication Metro-Transportation Control Technology Co

2B3- Impact of partial discharges on MV cable dissipation factor varying supply frequency and waveshape

Paolo Seri¹, Grazia Berardi², Marco Albertini², Stefano Franchi Bononi², Jacob Haney³, Koksai Tonyali³, Gian Carlo Montanari⁴; 1: University of Bologna, Italy; 2: Prysmian SpA, Italy; 3: Prysmian Cables and Systems LLC, USA; 4: Florida State University, USA

2B4- Study on the Partial Discharge Characteristics of Internal Void Defects under Special-shaped Wave Voltage

Min Tian¹, Wei Shen², Wen Cao¹, Changjiang Chen¹, Te Yang¹, Yan Du¹, Yan Du¹; 1: Xi'an Polytechnic University, School of Electronic Information; 2: State Grid Shannxi Electric Power Research Institute

2B5- Identification and analysis of partial discharges by means of acoustic emission sensors on insulators type PIN55-5

Joffre Fernando Chalco Montalván, Adrian Esteban Coronel Muñoz, Flavio Alfredo Quizhpi Palomeque; Universidad Politécnica Salesiana, Ecuador

2B6- Electromagnetic UHF Emission of Motor Turn-Turn Insulation Samples fed by SiC Converter

Alberto Rumi, Lorenzo Righetti, Andrea Cavallini, Paolo Seri; University of Bologna, Italy

2B7- Insulation System Characterization of High Frequency High Voltage Transformers

Francesco Guastavino¹, Samuele Galbiati², Bruno Massa², Eugenia Torello¹; 1: University of Genova, Italy; 2: Marelli Europe S.p.A. – Motorsport

2B8- Partial Discharge Behaviour Evaluation on MOSFET Employed in Automotive Applications

Ghulam Akbar¹, Antonino Imburgia¹, Giuseppe Rizzo², Alessio Di Fatta¹, Sinda Kaziz^{3,4}, Pietro Romano¹, Guido Ala¹, Fabio Viola¹; 1: University of Palermo, Italy; 2: Prysmian Electronics, Palermo, Italy; 3: SI2E Laboratory, École nationale d'ingénieurs de Sfax, Université de Sfax, Tunisia; 4: Faculté des sciences de Monastir, Université de Monastir, Tunisia

2B9- Discharge Identification for SF6 Gas-Insulated System Applying Multi-Physical Information Fusion

Kai Wang, Ming Ren, Jiahe Yu, Ming Dong; State Key Laboratory of Electrical Insulation for Power Equipment Xi'an Jiaotong University

2B10- The Impact of Superimposing Negative HVDC on AC Electrical Tree Growth in LDPE

Fang Liu¹, Faisal Aldawsari¹, Harry McDonald¹, Simon M. Rowland¹, Hualong Zheng²; 1: The University of Manchester, UK; 2: Chongqing University, China

2B11- Partial Discharge Characteristics of Oil-immersed Paper with Metal Impurities under AC and DC Com-pound Voltage

Chunjia Gao¹, Bo Qi¹, Binhao Chen¹, Fanqiu Zeng¹, Hongchuan Dong², Nan Wang², Licheng Lu³, Zhiyi Chong³; 1: State Key Laboratory of Alternate Electrical Power System with Renewable Energy Sources, North China Electric Power University; 2: State Grid Economic and Technological Institute Co.; 3: State Grid Corporation of China

2B12- Effect of Degassing Time on Initiation of Electrical Tree in XLPE

Jiaying He, Jian Fang, Fan Yang, Min Zhang; Guangzhou Power Supply Bureau Electricity Testing Institute of Guangdong Power Grid Co, China

2B13- Simulation of Electrical Tree Breakdown Process in Epoxy Resin with Phase Field Modeling

Yanfeng Qi¹, Tao Xu², Yufan Wang³, Zehui Zhang⁴, Jin Li⁴; 1: Laiwu Power Supply Company of State Grid Shandong Electric Power Company; 2: Tianjin Design Institute of China Petroleum Engineering Project Management Company; 3: High Voltage Branch, State Grid Tianjin Electric Power Company; 4: School of Electrical and Information Engineering, Tianjin University

2B14- Stationarity in Partial Discharge Time Series of Electrical Trees

Pablo Donoso, Roger Schurch, Jorge Ardila-Rey, Johnny Montana; Universidad Tecnica Federico Santa Maria, Chile

2B15- Impact of DC Polarity on Electrical Treeing in LDPE

Fang Liu¹, Simon M. Rowland¹, Harry McDonald¹, Hualong Zheng²; 1: The University of Manchester, UK; 2: Chongqing University, China

8:00- 10:00 am Poster 2C Aging and High Field Effects, Gather App

Chair: Nikola Chalashkanov, University of Lincoln, UK

Co-Char: Yazid Hadjadj, National Research Council, Canada

2C1- Investigation of Inverse Temperature Effects During Thermal-Radiation Aging of Semicrystalline Cable Insulation

Yelin Ni, Aishwarya Sriraman, Donghui Li, Ikumi Ellis, Leonard S Fifield; Pacific Northwest National Laboratory, USA

2C2- Dose Rate Effects in the Aging of Nuclear Cable Insulation Subjected to Gamma Radiation

Donghui Li, Aishwarya Sriraman, Yelin Ni, Ikumi Ellis, Mychal Spencer, Andy Zwoster, Leo Fifield; Pacific Northwest National Laboratory, USA

2C3- Impact of Insulation Degradation on the Thermal and Moisture Models of Oil Filled Power Transformers

Ghada Gmati¹, Patrick Picher², Oscar Arroyo-Fernandez², Issouf Fofana¹, DJamal Rebaine¹, Ungarala Mohan Rao¹; University of Quebec at Chicoutimi UQAC; 2: Hydro-Québec's research institute, Canada

2C4- Effect of Ethanol Concentration on Escherichia coli Sterilization using Pulsed Electric Field Application

Yuichi Murakami, Yuji Muramoto; Meijo University, Japan

2C5- Determination of critical distances measuring in needle-plane electrode arrangement with dust layer

László Székely, István Kiss, Richárd Cselkó; Budapest University of Technology and Economics, Hungary

2C6- The moisture diffusion simulation between oil-paper foil layer of transformer bushing by temperature gradient field

Siqi Chen, Quanmin Dai, Yongxin Huang, Zhiming Huang; Beijing Union University, China

2C7- Breakdown of Water Saturated Printed Circuit Boards in Dielectric Encapsulation for Deep-Sea Applications

Petrus Jacobus Pieterse¹, Saravanakumar Arumugam¹, Marius Bekker¹, Dirk Uhrlandt²; 1: University of Rostock, Germany; 2: Leibniz Institute for Plasma Research and Technology, Germany

2C8- Analysis on Sound and Vibration Characteristics of Power Transformer under different Harmonics in Load Condition

Zhe Zhuang¹, Huadong Liu¹, Tonghao Zhou², Fan Zhang¹, Bin Luo³, Tingting Wang³, Lei Jia³, Xipeng Chen³, Shengchang Ji¹; 1: State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University; 2: Electric Power Research Institute, State Grid Zhejiang

Electrical Power Grid Co., Ltd.; 3: Electric Power Research Institute of China Southern Power Grid Co., Ltd.

2C9- A Comparative Study of Blended Ester and Mineral Oil with Variances in Refining Processes

Prabhat Kumar Maiti; Central Power Research Institute, India

2C10- Effect of Aging on the Dielectric Performance of Synthetic Ester-based Nano-oils

Asfar Ali Khan, Suhaib Ahmad Khan, Mohd Tariq; Aligarh Muslim University, Aligarh, India

2C11- Enhancing Thermal Performances of Synthetic-Ester Insulating Oil via blending with Natural Ester

Liangxuan Ouyang, Feipeng Wang, Shi li, Chao Song, Zijian Yang, Jian Li; State Key Laboratory of Power Transmission Equipment & System Security and New Technology, Chongqing University, Chongqing, China

2C12- Relationship between Escherichia coli Sterilization in Ice and Electric Field Application

Masato Watanabe, Yukiko Hikosaka, Yuichi Murakami, Yuji Muramoto; Meijo University, Japan

2C13- Temperature Effect on Electrical Aging Model for Field-Aged Oil Impregnated Paper Insulation

Devayan Basu^{1,2}, Babak Gholizad^{1,3}, Robert Ross^{1,3,4}, Shima Mousavi Gargari³; 1: TU Delft, Netherlands; 2: ETH Zurich, Switzerland; 3: TenneT TSO; 4: IWO – Institute for Science & Development, Netherlands

2C14- Evaluation of solid insulating paper properties aged in natural ester and mineral insulating oil

Helena Wilhelm¹, Paulo Fernandes¹, Laís Pastre Dill¹, Kethlyn Moscon¹, Marco Marin², Germano Moraes², Tiago Marchesan³ and Vitor Bender³; 1: Vegoorl; 2: COPEL; 3: UFSM, Brazil

10:00- 10:30 am Coffee/Tea Break

10:30 am- 12:30 pm, Plenary D, Partial Discharge Measurements and Treeing, Ballroom

Chair: Leo S Fifield, Pacific Northwest National Laboratory, USA

Co-Chair: Pietro Romano, University of Palermo, Italy

D1-Use of Time-Frequency map combined with DBSCAN algorithm for separation of partial discharge pulses under DC voltage

Alessio Di Fatta¹, Pietro Romano¹, Antonino Imburgia¹, Guido Ala¹, Giuseppe Rizzo², Vincenzo Li Vigni², Marco Albertini², Stefano Franchi Bononi²; 1: University of Palermo, Italy; 2: Prysmian Group, Milan, Italy

D2- Tree Growth in Epoxy Resin Under Unipolar and Bipolar Square-Wave Voltages

Faisal Mohammed Aldawsari, Fang Liu, Harry McDonald, Simon Rowland; University of Manchester, UK

D3- Effects of Temperature Gradient on Electric Tree Growth with Harmonic Superimposed DC Voltage

Rundong Xue, Fan Li, Qi Li, Yifang Wang, Xiaoxiao Kong, Boxue Du; Key Laboratory of Smart Grid of Education Ministry, Tianjin University, China

D4-Evaluation of Different Waveforms to Study the Insulation Performance of Electrical Vehicle Motors

Thomas John Hammarstroem; Chalmers University of Technology, Sweden

D5- An Integrated Hardware-Software System to Identify the Underlying Distribution of PD Pulse Height Records

Michael Aguadze¹, Daniel Manu², Prathap Basappa¹; 1: Norfolk State University, USA; 2: University of New Mexico, USA

D6-The Influence of Short-Width SiC Pulses on the Partial Discharge Inception Voltage of Turn-Turn Insulation

Alberto Rumi, Andrea Cavallini; University of Bologna, Italy

2:00 pm- 4:00 pm Plenary E, Breakdown and Numerical Analysis

Chair: Giovanni Mazzanti, University of Bologna, Italy

Co-Chair: Mattewos Tefferi, G&W Electric, USA

E1- Streamer Criterion for Designing Gas-Insulated Medium Voltage Switchgear

Mattewos Tefferi¹, Foster Pyle¹, Andres Laso¹, Arturas Dauksas¹, Kennedy Darko¹, Nenad Uzelac¹, Adrian Scott², Weiran Xu²; 1: G&W Electric, USA; 2: Dassault Systèmes, Germany

E2- The Effect of Different Macroscopic Conductivity Equations on Life Estimation of HVDC Cables

Bassel Diban, Giovanni Mazzanti; University of Bologna, Italy

E3- Breakdown Prediction Modelling of XLPE Insulation under HVDC Thermoelectrical Stress

Julien FERNANDEZ, Raphaël GUFFOND; NEXANS R&T, France

E4- Stressed-volume approach and electric field spectrum

Enis Tuncer; Texas Instruments Inc., USA

E5- Breakdown Sites in MIM Structures

Herbert Erich Kliem; Saarland University, Germany

E6- A Compact, 300-kVDC Bushing for Operation under Ultra-High Vacuum Pressure

Moein Borghei, Robin Langtry, Robert McMullen, Brian Riordan and Ryan Walker; Avalanche Energy Designs Inc., USA

4:00 pm- 4:30 pm Coffee/Tea Break

4:30 pm- 6:10 pm Plenary F, Advanced Materials and Nanodielectrics, Ballroom

Chair: Thomas Andritsch, University of Southampton, UK

Co-Chair: Sombel Diaham, University of Toulouse, France,

F1- An Investigation of Mechanical Properties and Breakdown Strength of Polypropylene/Ultra-High Molecular Weight Polyethylene Nanocomposites

Phichet Ketsamee, Thomas Andritsch, Alun Vaughan; University of Southampton, UK

F2- Corona poling for polarization of nanofibrous mats: advantages and open issues

Leonardo Gasperini, Giacomo Selleri, Davide Pegoraro, Davide Fabiani; University of Bologna, Italy

F3- Poly(dicyclopentadiene) Coatings for the Mitigation of Surface Flashover in Gas Switch Housings

Matthew Burnette, Ray Martinez, J. L. Faubel, Paul G. Clem, Leah Appelhans; Sandia National Laboratories, USA

F4- 3D Reconstruction of TiO₂/Epoxy Nanocomposite for Evaluation of Agglomerate Disruption Effect

Kazuma Tagawa¹, Muneaki Kurimoto¹, Toru Sawada², Shigeyuki Yoshida², Takahiro Umemoto², Takahiro Mabuchi², Hirotaka Muto²; 1: Nagoya university, Japan; 2: Mitsubishi electric corporation, Japan

F5- Dielectric properties of fly ash geopolymers with two types of potassium activators

Patrick Brisebois, Michael DiMare, Claudiane Ouellet-Plamondon; ETS Montreal, Canada

Wednesday November 2nd, 2022

8:00- 10:00 am Poster 3A Outdoor Insulation and Surface Flashover, Gather App

Chair: Chuanyang Li, Tsinghua University, China

Co-Chair: Cheng Pan, Wuhan University, China

3A1- Analysis of Polypropylene Surface Discharge Characteristics with Pulse Sequence Analysis

Jianhong Song, Zepeng Lv, Yihe Li, Zhenyu Wu, Kai Wu, Yonghong Cheng; Xi'an Jiaotong University, China

3A2- Effect of Contact Angle of Water Droplets on the Electric Field Distribution of Polymer Insulators

B. A. T. N. K.B. Arachchi, Demy Antony, J. B. Gunasinghe, Nirasha Bataduvaarachchi, Janith Bimsara, Manuja Gunawardana, Rasara Samarasinghe; University of Moratuwa, Sri Lanka

3A3- Dry Arc Resistance of Aged Polymer-Fiberglass Laminates

A. Wilder², N. Frost¹ ; 1: Frosty's Zap Lab LLC; 2: The University of Texas at Austin, USA

3A4- Distribution laws of partial discharge and surface flashover of insulation cushion blocks for transformers

Chunjia Gao¹, Bo Qi¹, Hongjian Zhou¹, Yunze Wen¹, Yukun Zheng¹, Juzhen Wu², Huidong Tian², Hongchuan Dong², Licheng Lu³, Zhiyi Chong³; 1: State Key Laboratory of Alternate Electrical Power System with Renewable Energy Sources, North China Electric Power University; 2: State Grid Economic and Technological Institute co., Ltd.; 3: State Grid Corporation of China, China

3A5- Research on pollution flashover characteristics of hydrophilic surface under combined AC-DC voltage

Yang Luo, Bin Cao, Liming Wang; Tsinghua Shenzhen International Graduate School, Tsinghua University, China

3A6- Effect of Voltage Level on the Performance of Silicone Rubber in the Inclined Plane Tracking and Erosion Test

Basharat Mehmood¹, Refat Ghunem², Ayman El-Hag¹, Mohammad K. Hassan³, Leena Al-Sulaiti³, Ahmed Abdala⁴; 1: University of Waterloo, Canada; 2: National Research Council of Canada (NRC); 3: Center for Advanced Materials, Qatar University; 4: Chemical Engineering Program, Texas A&M University at Qatar, Doha, Qatar

3A7- Study on the influence of structural parameters on the electromechanical distribution of tri-post insulator

Fan Yun¹, Zhicheng Wu¹, Dexing Liu¹, Qingyun Chen¹, Fangji Liu¹, Qiaogen Zhang¹, Chao Gao²; 1: State Key Laboratory of Electrical Insulation

and Power Equipment, Xi'an Jiaotong University, Xi'an; 2: Electrical Power Research Institute of China Southern Power Grid, Guangzhou, China

3A8- Classification of Common Discharges in Outdoor Insulators Using Ultrasonic Signals

Abdulla Eyad Lutfi¹, Ayman ElHag¹, Khaled Shaban²; 1: University of Waterloo, Canada; 2: Qatar University, Qatar

3A9- Electric Field Computation and Insulation Structure Optimization for DC ± 500 kV Composite Tower

Xi YANG^{1,2}, Lijuan ZHU¹, Shenglong ZHU³, Shaorui QIN³, Xuhai ZHAN⁴; : Anhui Province Key Laboratory of Renewable Energy Utilization and Energy Saving (Hefei University of Technology); 2: State Key Laboratory of Electrical Insulation and Power Equipment (Xi'an Jiaotong University); 3: State Grid Anhui Electric Power Research Institute; 4: State Grid Anhui Electric Power CO., LTD., China

3A10- Hydrophobicity modification of large-scale PMMA by modularized DBD plasma reactor

Xiuhan Guan, Liyan Wang, Fangsong Li, Jingang Xu, Jinzhuo Li, Mingfeng Li, Xi Zhu, Zhi Fang; College of Electrical Engineering and Control Science, Nanjing Tech University, Nanjing, China

3A11- Charge Evacuation Performance of the Insulating Polymers with Various Surface Roughness

Kai Feng¹, Jia-wei Zhang¹, Si-chen Qin¹, Xuan Meng¹, Cheng Li², Wei Gao²; 1: School of Electrical Engineering, Xi'an University of Technology; 2: State Grid Shaanxi Electric Power Company, China

3A12- Effect of pulse voltage slew rate on the uniformity of polypropylene surface hydrophilic modification by nanosecond pulsed dielectric barrier discharge

Shuhao Li¹, Yanbo Ding², Yulei Zhao³, Junxian Yu⁴, Feng Liu⁵, Zhi Fang⁶; 1: Nanjing Tech University, China; 2: Nanjing Tech University, China; 3: Nanjing Tech University, China; 4: Nanjing Tech University, China; 5: Nanjing Tech

University, China; 6: Nanjing Tech University, China

3A13- The Dynamic Contact Angle of Water Droplets Subjected to AC Electric Fields

Qi Li^{1,2}, Yigui Li², Simon Rowland¹, Ian Cotton¹, Jianlin Hu², Xingliang Jiang²; 1: The University of Manchester, UK; 2: Chongqing University, China

8:00- 10:00 am Poster 3B, Measurement Techniques and Breakdown, Gather App

Chair: Refat Atef Ghunem, National Research Council, Canada

Co-Chair: Enis Tuncer; Texas Instruments Inc., USA

3B1- Development of Electrical Insulating Oil derived from Waste Edible Oil

Takuma Ino, Yuichi Murakami, Yuji Muramoto; Meijo University, Japan

3B2- Effects of Voltage on Streamer Discharge of Short Air Gap

Yuwei Fu¹, Mengsha He¹, Guowei Zhang², Chi Chen¹, Chuang Wang¹, Zaiqin Zhang¹; 1: School of Electrical Engineering, Xi'an University of Technology, Xi'an; 2: Xi'an XD High Voltage Apparatus Co.,Ltd., Xi'an, China

3B3- Theoretical research on insulation thickness design of 66 kV AC submarine cables

Yuantao Zhao¹, Qianyu Shan¹, Xuotong Zhao², Zerui Wang², Can Wang², Lijun Yang², Ruijin Liao²; 1: Ningbo Orient Wires & Cables Co., Ltd, China; 2: Chongqing University, China

3B4- The Discharge Mode of SF6 / N2 Gas Mixture in Extremely Inhomogeneous Electric Field under Power Frequency Voltage

Qingyun Chen¹, Zhicheng Wu¹, Fangji Liu¹, Fan Yun¹, Dexing Liu¹, Jiasheng Fan¹, Qiaogen Zhang¹, Chao Gao²; 1: State Key Laboratory of Electrical Insulation and Power Equipment, School of Electrical Engineering, Xi'an Jiaotong University, Xi'an 710049, P. R. China; 2: Electrical Power Research Institute of China Southern Power Grid, Guangzhou 510800, China

3B5- Design of a Test Method for Investigating the Influence of Zero Crossings on the Breakdown Voltage for Medium-Frequency Voltage Stresses

Jan Vocke, Alexander Schölzel, Albert Moser; IAEW, RWTH Aachen University, Germany

3B6- Mechanical Properties Of Epoxy-Bonded Continuously Transposed Conductors(CTCs) at High Temperature and its Influence on Mechanical Strength of Windings

Xiaoyu Zhu¹, Jiangyang Zhan², Lingfeng Jin², Zhi Yang², Suning Liang², Fan Zhang¹, Shengchang Ji¹; 1: Xi'an Jiaotong University, China; 2: Electric Power Research Institute of State Grid Zhejiang Electric Power Co. Ltd, Hangzhou

3B7- Adsorption of CO2 as a Buffer Gas for SF6-Alternative Insulation on Zeolite Molecular Sieves

Wenqiang Gao^{1,2}, Shubhashish Shubhashish^{2,3}, Luisa F. Posada^{2,3}, Charlotte Cabrera⁴, Jing Hao², Capri Price², Steven L. Suib^{2,3}, Yang Cao^{1,2}; 1: Department of Electrical and Computer Engineering, University of Connecticut, Storrs, Connecticut, 06269, USA; 2: Electrical Insulation Research Center, Institute of Materials Science, University of Connecticut 97 North Eagleville Road, Storrs, CT 06269-3136, USA; 3: Department of Chemistry, University of Connecticut, U-3060, 55 North Eagleville Rd., Storrs, Connecticut, 06269, USA; 4: École Nationale Supérieure des Ingénieurs en Arts Chimiques et Technologiques, Toulouse INP-ENSIACET, 4 Allée Emile Monso, 31030 Toulouse, France

3B8- Influence of first and second harmonic detection on the lower detection limit of acetylene gas concentration

Fangji Liu¹, Zhicheng Wu¹, Yizhou Jiao¹, Zhijun Ai¹, Luo Ning², Qiaogen Zhang¹; 1: Xi'an JiaoTong University, China; 2: Xi'an Doway Electric Technology Co., Ltd., China

3B9- Implementation of the Extended Insulation Parameters Method for Physical Interpretation of Diagnostic Measurement Data

Ann-Catrin Uhr-Müller, Friedmann
Eppelein, Christian Weindl; Coburg University of
Applied Sciences and Arts, Germany

**3B10- Feasibility Evaluation of DC Extruded
Cable with Conductor Operating Temperature
of 90 °C**

Tao Zhu¹, Xiao Gu¹, Haiyong Long²; 1: Shanghai
National Center of Testing and Inspection for
Electric Cable and Wire Co., Ltd., China; 2: TBEA
Shandong Luneng Taishan Cable Co., Ltd.

**3B11- Electric Field Distribution after Polarity
Reversal in HVDC Cables: The Effect of
Insulation Characteristics**

Bassel Diban¹, Giovanni Mazzanti¹, Massimo
Marzinotto² and Antonio Battaglia²; 1: University
of Bologna, Italy; 2: TERN, Roma, Italy

**3B12- Temperature Distribution Simulation in
an MV Switchgear Bus Bar Chamber**

Mijodrag Miljanovic¹, Martin Kearns² and Brian G
Stewart¹; 1: The Institute of Energy and
Environment, University of Strathclyde, Glasgow,
UK; 2: EDF Energy, East Kilbride, Scotland, UK

**3B13- Research on Electrical and Mechanical
Fault Diagnosis of High-Voltage Circuit
Breaker Based on Multi-sensor Information
Fusion**

Qinghua Ma¹, Ming Dong¹, Qing Li¹, Yadong
Xing¹, Yi Li¹, Qianyu Li¹, Lemeng Zhang²; 1: Xi'an
Jiaotong University, Xi'an, China; 2: China
Railway Signal & Communication Metro-
Transportation Control Technology Co, LTD,
Changsha, China.

**09:45- 10:00 am, Closing Remarks by
Conference Chair, Zoom**

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