

2014 IEEE CEIDP

IEEE CONFERENCE ON ELECTRICAL INSULATION AND DIELECTRIC PHENOMENA



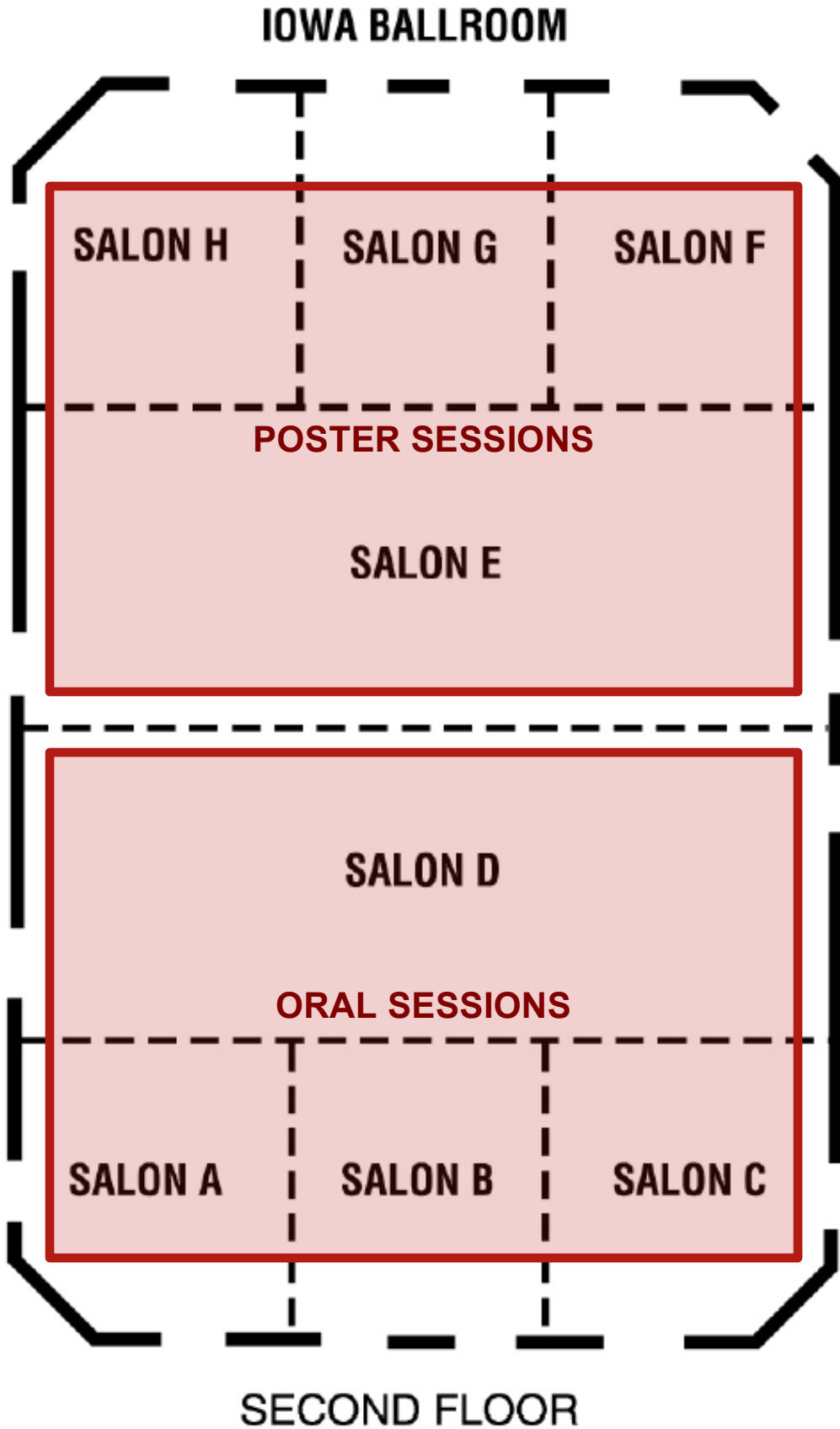
State Capitol Building, Des Moines, Iowa. Photo taken for www.randomiowa.com

October 19-22, 2014

**Des Moines Marriott Downtown,
700 Grand Avenue, Des Moines, Iowa, USA, 50309**

CONFERENCE PROGRAM





Welcome from the Conference Chair

We welcome you all to the 2014 IEEE Conference on Electrical Insulation and Dielectric Phenomena (CEIDP 2014). This year, the CEIDP is hosted in the capital and most populous city of the U.S. state of Iowa. This is located in the middle of the United States of America, in what is known as the American 'midwest'.

The Conference held its first meeting in 1920 when it was associated with the National Research Council of the US Academy of Sciences. Since 1981, the CEIDP has been fully sponsored by the Dielectrics and Electrical Insulation Society (DEIS) of IEEE and is held annually. It has been attracting a recurrent and substantial number of participants from academia, government, and industry from all over the world. The event provides an international forum to present and discuss current research in traditional topics as well as new and emerging areas of dielectric phenomena, electrical insulation and related topics. The CEIDP is renowned for encouraging the presence and participation of students by offering a number of stipends annually. We are particularly pleased to support students whom we expect will remain active in the field of electrical insulation and dielectrics.

We are confident that this year the CEIDP will be a success: It will be a participatory meeting with lively oral and poster sessions and enthralling discussions in a friendly atmosphere. This year, again, all efforts were engaged to provide you with a very stimulating technical program. Let us recall that every paper was assessed by two reviewers and checked for plagiarism (including self-plagiarism) with the CrossCheck software. In addition to these activities, there will be an organized visit to Iowa State University's Wind Energy Initiative.

This year, the conference received 334 submitted abstracts and, finally, 221 of these were included as full papers in the final program. Prior to the conference, the DEIS committee on nanodielectrics will hold a workshop that will include presentations dealing with various research aspects of advanced nanostructured dielectrics.

The conference opens each year with the Whitehead Memorial Lecture, named in honor of Dr. John Boswell Whitehead, a pioneer in electrical insulation and dielectrics research. The 2014 Whitehead Memorial Lecture will be given by Dr. Reimund Gerhard. Professor Gerhard, a Fellow of IEEE, is presently full

professor at the Department of Physics of the University of Potsdam (UP), Germany. The title of his lecture is "A Matter of Attraction – Electric Charges Localized on Dielectric Polymers Enable Electro-mechanical Transduction" and will certainly enlighten you. This talk is linked to a truly interdisciplinary field in which the fundamental interaction between electrostatic charges is used for detecting and effecting movement.

The CEIDP is indebted to many volunteers who devote their time and energy to ensure the best organization and smooth running of this meeting. This year, the executive committee comprised eight individuals. Efficient and very much different, they nonetheless blended into a very pleasant team working for the benefit of the CEIDP and its participants. Dr. Enis Tuncer was elected to serve as the Vice Chair/Treasurer, with responsibilities and/or skills to control the money flow and the Chairman's extravagant expenses. Prof. Issouf Fofana acted as Secretary with various duties, e.g. maintaining communications with the CEIDP board members and checking for IEEE practices regarding the "Quorum". Prof. Fabiani had the chance to show us his strength in skillfully handling the overwhelming task of organizing the Technical program. Thanks to Dr. Howard Penrose, the Publications and Publicity Chair, for "lifting" to expectation the website and its information. Thanks to Prof. Guan who accepted to act as the Nominating Committee Chair and to share with us his Chinese "wisdom". Mrs. Resi Zarb, the DEIS Meetings committee chair, provided for us invaluable comments and recommendations and "etc." during the process. Finally, thanks to Prof. Nicola Bowler for proposing Des Moines as a location for holding the CEIDP. Acting as the Local Arrangements Chair, she made demonstration of her numerous "talents" to make the event a success. Many other volunteers are acknowledged, low profile yet nonetheless essential to the scientific review process. All of them deserve our special appreciation for managing their respective tasks in an efficient and timely manner.

We wish you a successful and enjoyable meeting and sincerely hope that everyone will find the conference stimulating both intellectually and socially. But, the success of the event depends on you too ...

We look forward to greeting you in Des Moines.

Dr. Michel F. Fréchet,
for the 2014 CEIDP Executive Committee

Executive Committee

Michel Fréchette	<i>Conference Chair</i> Hydro-Quebec's Research Institute (IREQ), CANADA
Enis Tuncer	<i>Vice-Chair/Treasurer</i> Texas Instruments, USA
Davide Fabiani	<i>Technical Program Committee Chair</i> University of Bologna, ITALY
Nicola Bowler	<i>2014 Local Arrangements Chair</i> Iowa State University, USA
Issouf Fofana	<i>Conference Secretary</i> University of Quebec at Chicoutimi, CANADA
Zhicheng Guan	<i>Nominating Committee Chair</i> Tshinghua University, CHINA
Howard Penrose	<i>Publication and Publicity Committee Chair</i> SUCCESS by DESIGN, USA
Resi Zarb	<i>DEIS Meetings Committee Chair</i> Qualitrol-Iris Power, CANADA

Elected Board Members

Term Expiring 2014

Ruy A. P. Altafim	Federal University of Paraiba, BRAZIL
Frank Hegeler (*)	Naval Research Laboratory, USA
Davide Fabiani	University of Bologna, ITALY
Hulya Kirkici (*)	Auburn University, USA
Peter Morshuis (*)	UT Delft, NETHERLANDS
Reimund Gerhard	University of Potsdam, GERMANY
Antonios Tzimas	University of Manchester, UK

Term Expiring 2015

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Axel Mellinger (*)	Central Michigan University, USA
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Masoud Farzaneh (*)	University of Quebec at Chicoutimi, CANADA
V. Rodolfo Garcia-Colon (*)	Instituto de Investigaciones Electricas, MEXICO
Zhicheng Guan (*)	Tsinghua University, CHINA
Brian Stewart	Glasgow Caledonian University, UK
Nabeel Tawalbeh	University of Jordan, JORDAN

(*) Board members currently serving the 2nd consecutive 3-year term

Living Past Chairs

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Vijendra Agarwal	Minnesota State University, USA
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Martin G. Broadhurst	USA
Louis J. Frisco	USA
Reuben Hackam	University of Windsor, CANADA
Lynn L. Hatfield	Texas Tech University, USA
Huseyin R. Hiziroglu	Kettering University, USA
G. Edward Johnson	USA
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Marshall Pace	University of Tennessee, USA
Clive W. Reed	USA
Edward Sacher	Ecole Polytechnique, CANADA
Isidor Sauers	Oak Ridge National Laboratory, USA
Rajeswari Sundararajan	Purdue University, USA
A. van Roggen	USA
P. Keith Watson	USA
Roy E. Wooton	USA

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Vijendra Agarwal	Global Solutions and Consulting, USA
Ruy Alberto Pisani	San Paulo University, BRAZIL
Abderrahmane Beroual	Ecole Centrale de Lyon, FRANCE
Nicola Bowler	Iowa State University, USA
Christian Brosseau	University of Bretagne, FRANCE
Yang Cao	University of Connecticut, USA
Jerome Castellon	University of Montpellier, FRANCE
Andrea Cavallini	University of Bologna, ITALY
Eric David	ETS, CANADA
Issouf Fofana	UQAC, CANADA
Rodolfo Garcia-Colon	IIE, MEXICO
Virginie Griseri	University of Toulouse, FRANCE
Frank Hegeler	Naval Research Lab, USA
Henrik Hillborg	ABB, SWEDEN
Huseyin Hiziroglu	Kettering University, USA
Sverre Hvidsten	SINTEF, NORWAY
Sheshakamal Jayaram	University of Waterloo, CANADA
Hulya Kirkici	University of Auburn, USA
N.K. Kishore	IIT Kharagpur, INDIA
Andrej Krivda	ABB, SWITZERLAND
Christian Laurent	University of Toulouse, FRANCE
Paul Lewin	University of Southampton, UK
Jian Li	Chongqing University, CHINA
Peter Morshuis	TU Delft, NETHERLAND
Hitoshi Okubo	Aichi Institute of Technology, JAPAN

Isaias Ramirez Vázquez	IIE, MEXICO
Ruy Alberto Pisani	San Paulo University, BRAZIL
Simon Rowland	University of Manchester, UK
Isidor Sauers	RNL, USA
Yuriy Serdyuk	Chalmers University of Technology, SWEDEN
Rajeswari Sundararajan	Purdue University, USA
Toshikatsu Tanaka	Waseda University, JAPAN
Gilbert Teysse	University of Paul Sabatier, FRANCE
Kazuyuki Tohyama	Numazu National College of Technology, JAPAN
Enis Tuncer	Texas Instruments, USA
Alun Vaughan	University of Southampton, UK
Liming Wang	Tsinghua University, CHINA
Karim Younsi	GE GRC, USA
Kai Zhou	G&W Electric, USA

Reviewers

All the members of the Technical Program Committee and, in addition:

Vijendra Agarwal	Global Solutions and Consulting, USA
Ruy Alberto Pisani	San Paulo University, BRAZIL
Thomas Andritsch	University of Southampton, UK
Carlos Guastavo Azcarraga Ramos	IIE Cuernavaca, MEXICO
Sanjay Bahadoorsingh	University of West Indies, TRINIDAD & TOBAGO
Abderrahmane Beroual	Ecole Centrale de Lyon, FRANCE
Steve Boggs	University of Connecticut, USA
Nicola Bowler	Iowa State University, USA
Christian Brosseau	University of Bretagne, FRANCE
Yang Cao	University of Connecticut, USA
Juan Carlos Burgos	Universidad Carlos III Madrid, SPAIN
Jerome Castellon	University of Montpellier, FRANCE
Andrea Cavallini	University of Bologna, ITALY
Michael Chapman	Von Roll, SWITZERLAND
Alfredo Contin	University of Trieste, ITALY
Eric David	ETS, CANADA
Sombel Diahm	Université de Toulouse, FRANCE
Len Dissado	University of Leicester, UK
Davide Fabiani	University of Bologna, ITALY
Issouf Fofana	UQAC, CANADA
John Fothergill	University of Leicester, UK
Michel Fréchet	IREQ, CANADA
Kaori Fukunaga	NICT, JAPAN
Rodolfo Garcia-Colon	IIE, MEXICO
Virginie Griseri	University of Toulouse, FRANCE
Francesco Guastavino	University of Genova, ITALY
Stanislaw Gubanski	Chalmers University, SWEDEN
Frank Hegeler	Naval Research Lab, USA
Henrik Hillborg	ABB, SWEDEN
Huseyin Hiziroglu	Kettering University, USA
Hiroya Homma	CRIEPI, JAPAN
Sverre Hvidsten	SINTEF, NORWAY
Erling Ildstad	NTNU Trondheim, NORWAY
Sheshakamal Jayaram	University of Waterloo, CANADA

Hulya Kirkici	University of Auburn, USA
N.K. Kishore	IIT Kharagpur, INDIA
Andrej Krivda	ABB, SWITZERLAND
Christian Laurent	University of Toulouse, FRANCE
Severine LeRoy	LAPLACE, Toulouse, FRANCE
Paul Lewin	University of Southampton, UK
Jian Li	Chongqing University, CHINA
Juan Manuel Martinez Tarifa	Universidad Carlos III Madrid, SPAIN
Giovanni Mazzanti	University of Bologna, ITALY
Peter Morshuis	TU Delft, NETHERLAND
Yoshimichi Ohki	Waseda University, JAPAN
Tatsuki Okamoto	CRIEPI, JAPAN
Hitoshi Okubo	Aichi Institute of Technology, JAPAN
Isaias Ramirez Vázquez	IIE, MEXICO
Clive Reed	consultant, USA
Liu Rongsheng	ABB, SWEDEN
Simon Rowland	University of Manchester, UK
Isidor Sauers	RNL, USA
Yuriy Serdyuk	Chalmers University of Technology, SWEDEN
Nori Shimizu	Meijo University, JAPAN
Gary Stevens	University of Surrey, UK
Greg Stone	Iris Power, CANADA
Rajeswari Sundararajan	Purdue University, USA
Toshikatsu Tanaka	Waseda University, JAPAN
Yasuhiro Tanaka	University of Tokyo, JAPAN
Gilbert Teyssedre	University of Paul Sabatier, FRANCE
Kazuyuki Tohyama	Numazu National College of Technology, JAPAN
Enis Tuncer	Texas Instruments, USA
Antonios Tzimas	Alstom Grid Research & Technology, UK
Alun Vaughan	University of Southampton, UK
Liming Wang	Tsinghua University, CHINA
Peng Wang	Sichuan University, CHINA
Kai Wu	Xi'an Jiaotong University, CHINA
Karim Younsi	GE GRC, USA
Kai Zhou	G&W Electric, USA

Local Arrangements Committee

Nicola Bowler, Chair	Iowa State University, USA
Connor Daily	Iowa State University, USA
Rui Ding	Iowa State University, USA
Amin Gorji	Iowa State University, USA
Shuaishuai Liu	Iowa State University, USA
Rebecca Lorsch	Des Moines Marriott Downtown, USA
Robert Sheldon	Iowa State University, USA
Weixing Sun	Iowa State University, USA
Taylor Veenstra	Iowa State University, USA

Session Chairs and Co-Chairs

Thomas Andritsch	Univ. Southampton
Jerome Castellon	Univ. of Montpellier
Andrea Cavallini	University of Bologna
Eric David	ETS, Montreal
Sombel Diahm,	UPS Toulouse
Issouf Fofana	U. du Québec à Chicoutimi
Kaori Fukunaga	Nat Inst of Information and Communications Tech, Tokyo
Virginie Griseri	LAPLACE, Toulouse
Zhicheng Guan	Tsinghua University
Sheshakamal Jayaram	Univ. Waterloo
Andrej Krivda	ABB Switzerland
Christian Laurent	LAPLACE, Toulouse
Paul Lewin	Univ. of Southampton
Hitoshi Okubo	Aichi Inst. of Technology
Yasuhiro Tanaka	University of Tokyo
Enis Tuncer	Texas Instruments, Dallas
Alun Vaughan	Univ. of Southampton
Kai Wu	Xi'an Jiaotong University

Conference Overview

The 2014 Conference on Electrical Insulation and Dielectric Phenomena (CEIDP) is sponsored by the IEEE Dielectrics and Electrical Insulation Society to provide an international forum for the discussion of current research on electrical insulation, dielectric phenomena and related topics. The conference provides an opportunity for specialists from around the world to meet and to discuss ongoing research. Topics of interest to the Conference include: aging, biodielectrics, outdoor insulation, surface flashover, polarization phenomena, measurement techniques, partial discharge measurements, nanodielectrics, flow electrification, charge storage and transport, electrohydrodynamics, high-field effects, charge and field mapping, treeing, prebreakdown and breakdown in solids, liquids, gases, and vacuum.

The Whitehead 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 2014 Whitehead Memorial Lecture will be given by Dr. Reimund Gerhard.

Reimund Gerhard was born in Heidelberg, Germany in 1952. He studied mathematics and physics at the Technical University of Darmstadt from 1972 until 1978. After a research fellowship at the Department of Physics of the Collège Militaire Royal in Saint-Jean, Québec, Canada, he worked on his Ph.D. with Professor Gerhard Sessler in Darmstadt and received his doctorate in engineering (“Doktor-Ingenieur”) with a thesis on polymer electrets in 1984. From 1985 until 1994, he was a research scientist and project manager at the Heinrich-Hertz Institute (HHI) for Communications Technology in Berlin, Germany, where he led research teams in the areas of elastomeric diffraction-based light valves for the projection of high-definition television images and of electrically poled nonlinear optical (NLO) polymers. From 1992 until 1994, he was also a lecturer at the Technical University of Berlin (TUB). In 1994 and 1997, he was appointed associate and full professor, respectively, at the Department of Physics of the University of Potsdam (UP), Germany, where he

also served as Department Head and Director of the Institute of Physics and Astronomy. Professor Gerhard was Chairman of the Joint Board for the Master-of-Science Program in Polymer Science of the four major universities in Berlin and Potsdam (2004-2012) and Dean of the Faculty of Science at his university (2008-2012). Since October 2014, he is a Senator of the University of Potsdam.

His research team in Potsdam concentrates on the preparation, investigation and application of dielectric elastomers (so-called electro-electrets, also known as “Artificial Muscles” and “Sensing Skins”), polymeric space-charge electrets, polymer ferro- or piezoelectrets, ferro-, pyro- and piezoelectric polymers and polymer composites, as well as on the acoustical study of musical instruments, in particular with minimally invasive polymer sensors. Reimund Gerhard was awarded an “ITG-Preis” by the VDE Information Technology Society (ITG) in 1988 and a silver medal by the Foundation Werner-von-Siemens-Ring in 1989. In 1992 and 2011, respectively, he was elected Fellow of the Institute of Electrical and Electronics Engineers (IEEE) and of the American Physical Society (APS) for his contributions to the study of polymer dielectrics and electrets. From 2001 until 2009, he served as Digest Editor of the IEEE Dielectrics and Electrical Insulation Society (DEIS) and was elected its Vice President for Technical Activities for the years 2007, 2008 and 2014. He has been member of the CEIDP Board and of the IEEE DEIS AdCom for several years. Dr. Gerhard received awards for his technology-transfer activities in 2000 and 2001, was a guest researcher at AT&T Bell Laboratories in Murray Hill and Holmdel, U.S.A. and at Tongji University in Shanghai, China, and held visiting professorships at the École Normale Supérieure (ENS) de Cachan, France (in 1995/1996 and in 2014/2015), at the École Supérieure de Physique et de Chimie Industrielles (ESPCI) de la Ville de Paris, France, at the Instituto de Física de São Carlos (IFSC) and the Escola da Engenharia de São Carlos (EESC) of the Universidade de São Paulo (USP), Brazil, and at the Hebrew University of Jerusalem, Israel (HUJI).

Registration

All Conference attendees must register for the Conference.

Pre-registration is encouraged but not required. A registration desk will be available at the Conference.

	<i>Early Registration Fee</i> <i>Deadline: 09/19/2014</i>	<i>Registration Fee</i>	<i>Included with Registration</i>
IEEE Life Member	US\$ 370	US\$ 420	
IEEE Member	US\$ 500	US\$ 550	One copy of
IEEE/DEIS Member	US\$ 480	US\$ 530	Conference
Nonmember	US\$ 580	US\$ 630	Proceedings; Technical
Retired/Unemployed	US\$ 370	US\$ 420	Sessions; Reception;
Student Member	US\$ 370	US\$ 420	Banquet
Student Nonmember	US\$ 480	US\$ 530	

Optional Items

Workshop on Nanodielectrics – IEEE Member: US\$ 50.00; Non Member: US\$ 75.00;
Student/Lifetime/Retired: US\$ 25.00

Technical Tour: Iowa State University's Wind Energy Initiative – US\$ 20.00

Additional Pages – US\$ 100.00

Additional Banquet Ticket – US\$ 75.00

Cancellation Policy: All refund/cancellation requests must be provided in writing and received by **19 September, 2014**. There will be an administrative fee of **\$100** deducted from each refund.

Official Photograph

An official conference photograph will be taken directly following the Whitehead Memorial Lecture, at 9.30 am on Monday October 20, 2014, in the Des Moines Exhibit Hall on the third floor of the Des Moines Marriott Downtown. All registered conference attendees are encouraged to participate.

Hotel

All sessions and activities of the 2014 CEIDP will be held at Des Moines Marriott Downtown, 700 Grand Avenue, Des Moines, Iowa, USA, 50309.

See the conference or hotel website for information on the lodging rates:

<http://www.sites.ieee.org/ceidp-2014/>

<http://www.marriott.com/hotels/travel/dsmia-des-moines-marriott-downtown/>

For local arrangements and further information, please contact Dr. Nicola Bowler: nbowler@iastate.edu. Be sure to mention that you are attending the 2014 IEEE/CEIDP when making your reservation to receive the Conference room rates.

Visitor Attractions and Spouse/Guest Programs

Technical Tour: Iowa State University's Wind Energy Initiative

The tour will involve visiting laboratories conducting research in manufacturing, tower construction, sensors and measurements, and wind tunnel research related to facilitating the nation's goal of achieving 20 percent of energy from wind by 2030. We will depart by bus from the conference hotel at 2.15 pm on Tuesday October 21, returning 45 minutes prior to the banquet. Refreshments will be provided.

Website: <http://www.engineering.iastate.edu/research/eri/initiatives/strategies/wei/>

Pre-registration and payment required. \$20, non-refundable. 50 participants maximum.

Cultural Tour: Iowa State Capitol Building

Discover with this guided tour a truly impressive Iowa landmark and one of the nation's finest examples of 19th century architecture. You will have the opportunity to see the senate chamber, the house chamber, the law library and many other features. You will also appreciate from the inside the amazing work of art under the 23-karat gilded dome. The tour will last one hour to one hour and

twenty minutes. We will depart by shuttle bus from the conference hotel at 2.15 pm on Tuesday October 21, returning at 4.15 pm.

For more information about the Iowa State Capitol, please visit:

<https://www.legis.iowa.gov/resources/capitolFacts>

Pre-registration required. FREE. 30 participants maximum.

The State Historical Museum

The State Historical Museum tells the story of Iowa's growth and development through the exhibition of a rich collection of historic artifacts and documents. Approximately 1 mile from the conference hotel, accessible by walking or by hotel shuttle. Open hours: 9 am to 4.30 pm, Monday to Saturday; 12 noon to 4.30 pm Sunday.

Website: <http://www.iowahistory.org/museum/>

No registration required. Admission is FREE.

Des Moines Art Center

The not-for-profit Des Moines Art Center engages diverse local and international audiences with the art of today through its museum and school, adding to the cultural record through collections and programs. Please discuss your transportation needs with hotel staff. Open hours: 11 am to 4 pm, Tuesday, Wednesday, Friday; 11 am to 9 pm, Thursday; 10 am to 4 pm Saturday; 12 noon to 4 pm Sunday. Closed Monday.

Website: <http://www.desmoinesartcenter.org>

No registration required. Admission is FREE.

Hotel Dining

Rock River Grill & Tavern

American; Open for breakfast and lunch. Indulge all of your senses with a distinctive dining experience featuring an innovative menu of American Grill cuisine.

City Center Lounge

American; Open for dinner. The City Center Lounge, located in the Great Room at the Des Moines Marriott, offers a casual experience, catering to hotel guests as well as local downtown businesses and neighborhood clientele. Enjoy a cocktail or a bite to eat.

Local Dining & Events

Information available at the website of the Greater Des Moines Convention & Visitors Bureau:

<http://www.catchdesmoines.com>

Travel

The Des Moines Marriott Downtown hotel is approximately 5 miles from the Des Moines international airport (DSM). Transportation options from the Des Moines airport to the conference hotel are as follows:

- Airport shuttle service, on request, complimentary. Shuttle Phone: 1 515 245 5500
- Courtesy phone available near baggage claim area in the airport
- Yellow Cab; fee: 10 USD (one way); reservation required
- Estimated taxi fare: 20 USD (one way)

Financial Support For Students

US\$ 300 cash to be given the last day of the conference

Allocated according to the conditions:

- Once the paper has been accepted, an application for a stipend can be sent by the student to the Chair (frechette.mick@gmail.com). Please attach to the email the accepted version of the paper.
- The student is the main author of the accepted paper.
- The student's supervisor sends to the Chairman by email a letter of confirmation and support of the application for the stipend.
- The student registers for the conference and presents their paper in person.
- The order of the names on the acceptance list is determined by all the conditions above.

Please note that there is a budget limit for stipends. If necessary, the number of stipends by research team could be limited or some notions of scientific merit could intervene.

Michel Fréchette

2014 CEIDP Chair

IEEE/DEIS Technical Meetings

DEIS committee chairs or other individuals, planning on arranging or interested in arranging auxiliary meetings for working groups, technical committees or other related organizations should contact the Program Committee Chair.

2014 Annual Report

One copy of the 2014 Annual report (in USB format) will be provided with the registration. While supplies last, additional copies may be obtained at the Conference at a cost of US\$ 100 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
Fax: 732-981-9667.

————— **Sunday, October 19, 2014** —————

16:00-21:00 Registration

18:00-21:00 Reception (Cash bar)

————— **Monday, October 20, 2014** —————

8:00-8:15 Welcome

Michel Fréchette, IREQ, Canada

8:15-9:30 Whitehead Lecture

A Matter of Attraction: Electric Charges Localised on Dielectric Polymers Enable Electromechanical Transduction

Reimund Gerhard, *University of Potsdam*

9:30-10:00 Break

10:00-12:20 Session 1 (Oral): Prebreakdown, Breakdown and Partial Discharges

Chair: Christian Laurent, LAPLACE, Toulouse

Co-chair: Hitoshi Okubo, Aichi Inst. Of Technology

1-1 Inception Level of Partial Discharges in SF₆ Induced with Short X-Ray Pulses

Myriam Koch¹, Markus Bujotzek², Christian M. Franck¹, *1 ETH Zurich, 2 ABB Switzerland Ltd*

1-2 Monte Carlo Studies of Hot Electron Transport and High Field Degradation

Ying Sun, Steven Boggs, Ramamurthy Ramprasad, *University of Connecticut*

1-3 On the nature of surface discharges in silicone-gel: Prebreakdown discharges in cavities

Masahiro Sato¹, Akiko Kumada¹, Kunihiko Hidaka¹, Keisuke Yamashiro², Yuji Hayase², Tetsumi Takano², *1 The University of Tokyo, 2 Fuji Electronic Co., Ltd.*

1-4 Dark current measurements in pressurized SF₆: influence of relative humidity and temperature

Laetitia Zavattoni^{1,2}, Rachelle Hanna², Olivier Lesaint², Olivier Gallot-Lavallée², *1 Siemens company, 2 G2Elab, CNRS and Grenoble University*

1-5 On Excess Current During and After Partial Discharge Activity

Xiangdong Xu¹, Tord Bengtsson², Jörgen Blennow¹, *Stanislaw M. Gubanski¹ 1 Chalmers*

University of Technology, 2 ABB Corporate Research

1-6 Partial Discharges in Narrow Gaps on Power Electronic Converter

Abdelghaffar Abdelmalik¹, Arne Nysveen¹, Lars Lundgaard², *1 Department of Electric Power Engineering, Norwegian University of Science and Technology, 2 Electric Power Technology, SINTEF Energy Research*

1-7 The influence of impulsive voltage frequency on PD features in turn insulation of inverter-fed motors

Peng Wang¹, Andrea Cavallini², Gian Carlo Montanari², *1 School of Electrical Engineering and Information, Sichuan University, 2 LIT/DIE, University of Bologna*

12:20-14:00 Lunch

14:00-16:00 Session 2 (Oral) - Treeing, Surface Flashover and Outdoor Insulation

Chair: Zhicheng Guan, Tsinghua University

Co-chair: Issouf Fofana, U. du Québec à Chicoutimi

2-1 Three dimensional imaging of electrical trees in micro and nano-filled epoxy resin

Roger Schurch¹, Simon M. Rowland¹, Robert S. Bradley¹, Teruo Hashimoto¹, George E. Thompson¹, Philip J. Withers¹, *1 University of Manchester*

2-2 Time Evolution Phenomena of Electrical Tree Partial Discharges in 5 wt% MgO, Alumina and Silica Epoxy Nanocomposites

Darryn Cornish, Cuthbert Nyamupangedengu, *University of the Witwatersrand, Johannesburg, South Africa*

2-3 Gas Heating and Streamer-to-Leader Transition of Impulse Surface Discharge on Quartz Glass in Atmospheric Air

Takao Matsumoto, Ryo Sasamoto, Yasuji Izawa, Kiyoto Nishijima, *Fukuoka University*

2-4 Effect of high dielectric protrusions on the breakdown phenomena of large electrodes under positive switching impulses

Liliana Arevalo, Dong Wu, *ABB Power Systems HVDC*

2-5 Dynamics of Dry-Band Arcing on Silicone Rubber in the Inclined Plane Test under AC, +DC and -DC Voltages

Refat Ghunem, Shesha Jayaram, Edward Cherney, *University of Waterloo*

- 2-6 Experimental method for investigations on the influence of superimposed AC/DC field stress on the flashover performance of polluted outdoor insulators

André Wagner, Jens Knauel, RWTH Aachen University

16:00-16:30 Break

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

Chair: Andrej Krivda, ABB Switzerland

Co-chair: Thomas Andritsch, Univ. Southampton

Session 3A: Prebreakdown and Breakdown in Solids, Liquids, Gases and Vacuum

- 3A-1 Pre-breakdown Arcing and Electrostatic Discharge in Dielectrics under High DC Electric Field Stress

Allen Andersen¹, JR Dennison¹, 1 Utah State University

- 3A-2 Equivalent Permittivity of LTDs Secondary-turn-insulation and its Application to Electric Field Simulation

Chuang Zeng¹, Xiaoquan Zheng¹, Lijuan Zhang¹, Xiangbo Xu¹, Yufeng Qian¹, Junjie Zheng¹, 1 Xi'an Jiaotong University

- 3A-3 Investigation of particles on insulator surfaces in gas insulated systems under DC stress

Maria Hering¹, Joachim Speck¹, Steffen Großmann¹, Uwe Riechert², 1 Technische Universität Dresden, Germany, 2 ABB Switzerland Ltd, Zurich, Switzerland

- 3A-4 Multi-Contaminating Particles Initiated Breakdown with Different Spacer Types inside Gas Insulated Bus Ducts

Sayed Ward, Mousa Abd Allah, Amr Youssef, Faculty of Engineering at Shoubra, Benha University

- 3A-5 Analysis of Partial discharge of Spherical Cavities in EPR at Different Frequency

Zhipeng Lei, Jiancheng Song, Muqin Tian, Chunyu Xu, Pulong Geng, Lingyan Lin, Yunguang Gao, Taiyuan University of Technology

- 3A-6 Negative LI Breakdown Behaviour of Electrodes with Thin Dielectric Coatings in Dry Air at High Pressure

Dennis van der Born¹, Peter Morshuis¹, Johan Smit¹, Alain Girodet², 1 Delft University of Technology, 2 Alstom Grid

- 3A-7 Influence of Thick Epoxy Nanocomposite Coatings on Lightning Impulse Breakdown Behavior in Air

Dennis van der Born¹, Alex Tsekmes¹, Peter Morshuis¹, Johan Smit¹, Alain Girodet², 1 Delft University of Technology, 2 Alstom Grid

- 3A-8 The Impact of Interfaces and Space Charge formation on Breakdown Strength of Epoxy Resin

Ibrahim Idrissu¹, Simon Rowland¹, Antonios Tzimas², 1 The University of Manchester, 2 Alstom Grid UK

- 3A-9 Influence of humidity and temperature on the dielectric properties of thermally sprayed ceramic MgAl₂O₄ coatings

Minna Niittymäki¹, Kari Lahti¹, Tomi Suhonen², Ulla Kanerva², Jarkko Metsäjoki², 1 Tampere University of Technology, 2 VTT Technical Research Centre of Finland

- 3A-10 Research the Length of the Positive Corona Using the Digital Image Processing Technology

Qizheng Ye¹, Xingwang Li², Yu Hu¹, Yi Sun¹, 1 Huazhong University of Science and Technology, 2 Electric Power Research Institute of Guangdong Power Grid Corporation

- 3A-11 Thermal Breakdown Modeling in Polyimide Films Considering Different Conduction Models

S. Diahm^{1,2}, D. Malec^{1,2}, D. Mary^{1,2} and M.-L. Locatelli^{1,2}, 1 Université de Toulouse; UPS, INPT; LAPLACE, 2 CNRS; LAPLACE; Toulouse, France

- 3A-12 Impulse Dielectric Behavior and Breakdown Mechanism under Sphere-Plane Gap in Dry air

Feng Li¹, Aiqing Ma¹, Zhousheng Zhang¹, Lu Zhao¹, Dong Shen², Yin hao Jin², Bin Cao², Jingli Ni², 1 Shanghai University Of Electric Power, 2 State Grid shanghai fengxian Electric Power Supply Company

- 3A-13 Effect of Kraft Paper Barriers on Bridging in Contaminated Transformer Oil

Shekhar Mahmud¹, George Chen¹, Igor Golosnoy¹, Gordon Wilson², Paul Jarman², 1 University of Southampton, 2 National Grid UK

- 3A-14 Effect of Different Shapes of Electrodes on Bridging in Contaminated Transformer Oil

Shekhar Mahmud¹, George Chen¹, Igor Golosnoy¹, Gordon Wilson², Paul Jarman², 1 University of Southampton, 2 National Grid UK

- 3A-15 Analysis of Breakdown Probability for Multi-layer Film Insulation of LTDs Secondary-turn
Chuang Zeng, Xiaoquan Zheng, Lijuan Zhang, Xiangbo Xu, Yufeng Qian, Junjie Zheng, Xi'an Jiaotong University
- 3A-16 Influence of Space Charge by Primary and Secondary Streamers on Breakdown Mechanism under Non-uniform Electric Field in Air
Takuya Kitamura¹, Hiroki Kojima¹, Kinya Kobayashi², Tatsuro Kato², Toshiaki Rokuho², Naoki Hayakawa¹, ¹ Nagoya University, ² Hitachi Ltd.
- 3A-17 Electrical Breakdown of Dielectric Elastomer and Lamination Effect
Masatoshi Yamada, Toyohashi University of Technology
- 3A-18 Electron swarm parameters in gas mixtures of CF₃I, SF₆, CO₂ with N₂ at atmospheric pressure
Tomohiro Omori, Daisuke Simizu, Takao Matsumoto, Yasuji Izawa, Kiyoto Nishijima, Fukuoka University
- 3A-19 Comparison of Electric Stress Enhancement in Paper Oil insulation due to copper sulphide by experimental method and simulation using FEM
Daisy Flora, Sundara Rajan J, Central Power Research Institute
- 3A-20 DC prestressing effect on breakdown characteristic of insulating paper in liquid nitrogen or insulating oil
Tomohiro Kawashima¹, Yoshinobu Murakami¹, Masayuki Nagao¹, Yoshihiro Inagaki², Yuichi Ashibe², Takato Masuda², ¹ Toyohashi University of Technology, ² Sumitomo Electric Industries, Ltd.
- 3A-21 Streamer and Breakdown Phenomena Under Step and Lightning Impulses in Various Hydrocarbon Liquids
A. Denat, O. Lesaint and F. Mc Cluskey, Grenoble Electrical Engineering Laboratory, Univ. Grenoble Alpes
- Session 3B: Partial Discharge Measurements**
- 3B-1 Influence of Air Pressure during Vacuum Casting on Partial Discharge Inception Characteristics for Epoxy/ Enamel Composite Insulation Systems
Yusuke Nakamura¹, Miwa Takeuchi¹, Teruhiko Maeda², ¹ Toshiba corporation, ² Toshiba Industrial Products and Systems Corporation
- 3B-2 X-ray triggered PD measurements in small sized spherical voids at the detection limit
Christopher Schmitt¹, Lorenz Herrmann¹, Sergey Pancheshnyi¹, Sedat Adili², Christian Franck², ¹ ABB Corporate Research, ² ETH Zurich
- 3B-3 Pulse waveform based identification and classification technique of PD for the high voltage power apparatuses
Zhang Zhousheng, Ma Aiqing, Li Feng, Zhao lu, Shanghai University of Electric Power
- 3B-4 Comparison between first-order integral value of optical signals and partial discharge magnitude in GIS
Liang Huang¹, Ju Tang¹, Fuping Zeng², ¹ Chongqing university, ² Wuhan university
- 3B-5 A Comparative Study of Partial Discharges Under Power and Very Low Frequency Voltage Excitation
Thinh Dao, B.T. Phung, Trevor Blackburn, H.V.P. Nguyen, University of New South Wales
- 3B-6 Analysis of HV Cable Faults Based on Correlated HFCT and IEC60270 Measurements
Ross Gillie¹, Alan Nesbitt¹, Roberto Ramirez-Iniguez¹, Brian Stewart¹, Graham Kerr², ¹ Glasgow Caledonian University, ² FMC Technologies Bellshill
- 3B-7 Study on ceramic insulation wires for motor windings
Dorin Cozonac¹, Sylvain Babicz¹, Peng Wang², Sonia Ait-Amar - Djennad¹, Gabriel Velu¹, Andrea Cavallini³, ¹ Université d'Artois, ² Sichuan University, ³ University of Bologna
- 3B-8 Preliminary study of using anodized aluminum strip for electrical motors winding
Sylvain Babicz, Sonia Ait-Amar - Djennad, Gabriel Velu, Université d'Artois
- 3B-9 Electrical discharge in enamel-insulated, hairpin copper conductors
Huseyin Hiziroglu¹, Daniel Taylor¹, Peter Foss², ¹ Kettering University, ² Global Research Center, General Motors
- 3B-10 PD measurement of open air HV cable termination at the ground plate without coupling capacitor
Szilárd Lipták¹, Reinhold Bräunlich², Thomas Brügger², Zoltán Ádám Tamus¹, ¹ Budapest University of Technology and Economics, ² FKH Fachkommission für Hochspannungsfragen

- 3B-11 Identification of Multiple Partial Discharge Sources in High Voltage Transformer Windings
Nik Hakimi Bin Nik Ali, Jack A. Hunter, Paolo Rapisarda, Paul Lewin, *University of Southampton*
- 3B-12 Partial Discharge Inception Voltage Measurement and PD Location Identification of Enamel Coating Ribbon Wire used for Low-voltage Motors
Naoto Yanaze¹, Hirotaka Nakaya¹, Masayuki Hikita¹, Masahiro Kozako¹, Keiichi Tomizawa², Makoto Ohya³, *1 Kyushu Insutitute of Technology, 2 Furukawa Magnet Wire Co., Ltd., 3 Furukawa Electric Co., Ltd.*
- 3B-13 Fiber Optic Fabry-Perot sensor with stabilization technology for acoustic emission detection of partial discharge
Weichao Zhang, Hong Zhao, *Harbin University of Science and Technology*
- 3B-14 Partial Discharge Calibration using Frequency Domain Measurement in Power Cable
Jun Guo, Wen Shu, Oscar Morel, *UtilX Corporation*
- 3B-15 Partial Discharge Activities in Transformet Insulation under Steep Front Voltages
Mahdi Khanali, Shesha Jayaram, *University of Waterloo*
- 3B-16 A Comparative Analysis of Characteristics of Different Partial Discharge Signals Detected by F-P Optical Fiber Sensor in the Transformer
Jiazhen Du¹, Wei Wang¹, Fuping Li¹, Mingmin Wang², Jiefeng Gu¹, *1 Beijing Key Laboratory of High Voltage & EMC, North China Electric Power University, 2 State Grid Jiangsu Electric Power Company*
- 3B-17 Classification of defects in ceramic insulators using partial discharge signatures extracted from RF signals
Shaharyar Anjum¹, Ayman El-Hag², Sheshakamal Jayaram¹, Ali Naderian³, *1 University of Waterloo, 2 American University of Sharjah, 3 Kinectrics Inc*
- 3B-18 Acoustic detection of single and multiple air-gap partial discharges with piezoelectrets transducers
Thamyres Tãmulla Cavalcante Palitó¹, Ruy Alberto Pisani Altafim², Clovis Ferreira Reis², Yuri Andrey Olivato Assagra¹, Mardson Freitas de Amorim², Antonio Carlos Cavalcanti², Ruy Alerto Corrêa Altafim¹, Jose Francisco Resende da Silva¹, *1 University of São Paulo, 2 Federal University of Paraíba*
- 3B-19 Evolution of bubble in oil-paper insulation and its influence on partial discharge
Zhong Zheng¹, lihua Chen², Junwei Diao³, Rongliang Wang⁴, *1 North China Electric Power University, 2 University of Connecticut, 3 Guangzhou Power Supply Co. Ltd., 4 TianJin Electric Power Maintenance Company*
- 3B-20 Partial Discharges on IGBT Modules: are Sinusoidal Waveforms Sufficient to Evaluate Behavior?
Pietro Romano, F. Viola, R. Miceli, C. Spartaro, B. D'Agonstino, A. Imburgia, D. La Cascia, M. Pinto, *DEIM - Palermo University*
- Session 3C: Biodielectrics**
- 3C-1 Influence of Ion Concentration in Aqueous Solution on Sterilization of E. coli by High Electric Field Pulse
Yuichi Murakami, Yuji Muramoto, Noriyuki Shimizu, *Meijo University*
- 3C-2 Effective pancreatic cancer treatment using electrical pulses: An in vitro model study
Sarathi Ramanujam¹, Suresh Kumar Rayala¹, Praveen Kumar², Raji Sundararajan³, *1 IIT Madras, 2 IIT-Madras, 3 Purdue University*
- 3C-3 Breast cancer treatment using curcumin, the natural herbal dielectric
Ignacio Camarillo¹, Bhuvaneshwari Sampath², Vivek Sivakumar², Wan-Ying Lin¹, Kavitha Sankaranarayanan³, Arutselvan Natarajan⁴, Raji Sundararajan¹, *1 Purdue University, 2 AU-KBC, MIT, 3 AU-KBC, 4 Stanford University*
- 3C-4 Electric field distribution in Brain tumors
Sri Harsha Venuturumilli¹, Raji Sundararajan², *1 IIT-Madras, 2 Purdue University*
- 18:30-19:30 Dinner**
- 19:30-21:30 Session 4 (Poster)**
- Chair: Sombel Diaham, UPS Toulouse
Co-chair: Sheshakamal Jayaram, Univ. Waterloo
- Session 4A: Outdoor Insulation**
- 4A-1 Behavior of water droplets on polymeric insulation surfaces under hybrid field stress
Jens Knauel, André Wagner, Ralf Puffer, *RWTH Aachen University*

- 4A-2 The influence of the plasma jet on the hydrophobicity transfer rate of contaminated silicone rubber
Jie Chen¹, Yang Liu¹, Zhicheng Zhou¹, Ruobing Zhang², *1 State Grid Jiangsu Electric Power Company Research Institute, 2 Tsinghua University*
- 4A-3 Selection Methods of Cap and Pin Disk Insulators Used in High Altitude and Pollution Area
Xingliang Jiang¹, Lina Dong², Zhijin Zhang¹, Li Lin¹, *1 Chongqing University, 2 State Grid Chongqing Shiqu Power Supply Bureau*
- 4A-4 Local Collection Characteristics of Water Droplets with an Aerodynamics Insulator's Surface in Icing Condition
Zhijin Zhang¹, Xingliang Jiang¹, Li Lin¹, Lina Dong², *1 Chongqing University, 2 Shiqu Power Supply Bureau*
- 4A-5 Contaminating Performance of Typical Suspension Disk Porcelain Insulators in Natural Condition
Zhijin Zhang¹, Li Lin¹, Xingliang Jiang¹, Dongdong Zhang¹, Jiwu Zhang², Lixiang Xiong², *1 Chongqing University, 2 Huaihua Electric Power Survey & Design Institute*
- 4A-6 Shed Spacing Optimization of UHV Composite Post Insulators at High Altitude
Yu Gu¹, Lin Yang¹, Qiuping He¹, Yongxia Han¹, Fuzeng Zhang², Yiwei Xue¹, Yanpeng Hao¹, Licheng Li¹, *1 South China University of Technology, 2 China Southern Power Grid Co., Ltd.*
- 4A-7 Effective Equivalent Salt Deposit Density of Polluted Silicone Rubber Insulators in Wetting Process
Liang Xidong, Wu Chao, Yao Yiming, Liu Yingyan, Gao Yanfeng, Wang Jiafu, *Tsinghua University*
- 4A-8 Cleaning Effect of Rainfall on Salt in Pollution Layer of Silicone Rubber Insulators
Wu Chao¹, Gao Yanfeng¹, Wang Jiafu¹, Wang Jing², Liang Xidong¹, Liu Yingyan¹, Xu Tao³, Liu Qin³, *1 Tsinghua University, 2 Electric Power Planning and Engineering Institute, 3 China Electric Power Research Institute*
- 4A-9 Performance of HTV silicone rubber exposed to acidic fog under DC stress
Jihuan Tian¹, Hongjie Sun¹, Henrik Hillborg², Anders Holmberg³, Fumei Wu¹, *1 ABB Corporate Research, Beijing, China, 2 ABB Corporate Research, Västerås, Sweden, 3 ABB AB Composites, Piteå, Sweden*
- 4A-10 Electric Field Computation and Optimization of Composite Tower in 330 kV Double Circuit Transmission Lines
Qingyu Wang, Zongren Peng, Xi Yang, Naiyi Li, Jialong Wang, Jintao Liao¹, *Xi'an Jiaotong University*
- 4A-11 Electrical Field Evaluation of 400kV Converter Quadrivalve Corona Shields in High Altitude Area
Jialong Wang, Zhixiang Deng, Hao Wu, Zongren Peng, *Xi'an Jiaotong University*
- 4A-12 Wavelet Packet Transform based Multi Resolution Analysis Technique for Classification of LC Waveforms on Polluted Insulating Surfaces
Ahmed Khaled Chaou¹, Abdelouahab Mekhaldi¹, Madjid Teguair¹, Issouf Fofana², Fethi Meghnefi², *1 Ecole Nationale Polytechnique d'Alger, 2 Université du Québec à Chicoutimi*
- 4A-13 Flashover Performance of UHV&EHV Post Insulators under Icing Conditions
Xu Zuoming¹, Xu Tao², Yao Tao², Li Xuelin², Li Jin², Chen Jiaying², Cai Lin², Jia Ru², *1 Xi'an Jiao Tong University, 2 China Electric Power Research Institute*
- 4A-14 Air Gap Flashover Characteristics and Selection of Gap Distances for 1100kV DC U-shaped wall bushing
Xiaoqing Luo, Wei Hu, Zuoming Xu, Xiongjie Xie, Tao Xu, Feng Huo, Qiming Ye, *China Electric Power Research Institute*
- 4A-15 Analysis of Leakage Current of Long String Insulator under High-Altitude Artificial Contamination Test
Qin Liu, Xiaodong Wan, Tao Xu, Jing Nan, Zuoming Xu, *China Electric Power Research Institute*
- 4A-16 Research on corona inception electric-field strength and critical electric-field values for valve hall fittings
Hao Wu, Jialong Wang, Peng Liu, Zongren Peng, Zhixiang Deng, Xinzhao Wei, *Xi'an Jiaotong University*
- 4A-17 The Research of 110kV Transmission Line Reinforced Insulation Jacket
Yang Jin¹, Haifeng Liu², Zhiguo Duan², Jin Pan³, Shuguo Gao³, Xiaoquan Zheng¹, *1 Xi'an Jiaotong University, 2 Hebei Electric Power Corporation, 3 State Grid Hebei Electric Power Company*

- 4A-18 Analysis on Antipollution Flashover Performance of RTV Coating after Long-term Running
Yang Cuiru¹, Lin Yifeng¹, Rao Zhangquan¹, Lu Hai², Zeng Zhiyang², Lin Chunyao¹, 1 *Guangdong Electric Power Research Institute*, 2 *Graduate School at Shenzhen, Tsinghua University*
- 4A-19 The Influences of Flexible Epoxy Resin Proportion on Epoxy Composites Dielectric Properties
Hua Feng, Zongren Peng, Xin Ning, Jialong Wang, Peng Liu, Zihao Guo, *Xi'an Jiaotong University*
- 4A-20 Research on the shed crack of composite insulators used in strong wind area
Xilin Wang, Zhengyi Zhu, Zhidong Jia, Zhicheng Guan, *Tsinghua University*
- 4A-21 Research on the Material and Pollution-Flashover Properties of Hard Composite Insulators
Chenlong Zhao, Mingxi Zhu, Hongwei Mei, Liming Wang, Zhicheng Guan, *Tsinghua University*
- 4A-22 A Novel Method of Detecting Contamination State on the Hydrophobic Surface
Genggeng Wang¹, Liming Wang¹, Hongwei Mei¹, Mingxi Zhu¹, Zhicheng Guan¹, Yang Xiang², 1 *Tsinghua University*, 2 *Institute of Science and Technology of China Southern Power Grid*
- 4A-23 Fractal analysis of silicone rubber insulation evaluated in inclined plane
Isaias Ramirez-Vazquez¹, Eduardo Salgado-Talavera¹, José Ruiz-Pinales², 1 *Instituto de Investigaciones Electricas*, 2 *Universidad de Gto-Campus Salamanca*
- 4A-24 Field Investigation of the Performance of Insulators Treated with Semiconductive Coating
Zhidong Jia¹, Yarong Hu¹, Xiaoxing Wei¹, Zhicheng Guan¹, Zhihai Xu², 1 *Tsinghua University*, 2 *Guangdong Electric Power Research Institute*
- 4A-25 Influence of organic pollutants on the pollution flashover properties of porcelain insulators
Zhicheng Zhou¹, Mingxi Zhu², Song Gao¹, Chenlong Zhao², Liming Wang², 1 *Electric Power Research Institute of Jiangsu Province*, 2 *Graduate School at Shenzhen, Tsinghua University*
- 4A-26 Influence of Nitric Acid Diffusion in Sheath on Brittle Fracture of Composite Insulator
Jiafu Wang¹, Xidong Liang¹, Jian'an Li², 1 *Tsinghua University*, 2 *State Grid Beijing Electric Power Company*
- 4A-27 Characteristic of Composite Insulator Leakage Current in Contamination and Humidity Conditions
Cong Wang¹, Tianfu Li¹, Qingjun Peng², Youping Tu¹, Lifeng Zou², Shaoquan Zhang², 1 *North China Electric Power University*, 2 *Yunnan Power Grid Corporation, Kunming*
- 4A-28 Feasibility Analysis of Polymeric Material Insulator Applied to the Phase to Earth Insulation of Transmission Line
Yayun Gao¹, Hongwei Mei¹, Liming Wang¹, Zhicheng Guan¹, Ming Lu², 1 *Tsinghua University*, 2 *Henan Electric Power Research Institute*
- 4A-29 Research on the Optimal Structure of Composite Insulator Installed Extra Large Sheds
Meng Xiaobo, Hongwei Mei, Liming Wang, Zhicheng Guan, *Graduate School at Shenzhen, Tsinghua University*
- Session 4B Treeing and Surface Flashover**
- 4B-1 The effect of interface modification on electrical tree growth and breakdown time of epoxy resin
Michalis Pattouras, Simon Rowland, *The University of Manchester*
- 4B-2 Study of Electrical Tree Incubation in Silicone Rubber
Yuanxiang Zhou¹, Yunxiao Zhang¹, Rui Liu¹, Xu Zhang², Mingyuan Wang¹, 1 *Tsinghua University*, 2 *North China Electric Power Research Institute Co, Ltd*
- 4B-3 Prognostic Modelling for Electrical Treeing in Solid Insulation using Pulse Sequence Analysis
Nur Hakimah Aziz¹, Victoria Catterson¹, Martin Judd¹, Simon Rowland², Sanjay Bahadoorsingh³, 1 *University of Strathclyde*, 2 *University of Manchester*, 3 *University of the West Indies*
- 4B-4 Effect of harmonics on Pulse Sequence Analysis Plots from Electrical Trees
Nur Hakimah Aziz¹, Victoria Catterson¹, Simon Rowland², Sanjay Bahadoorsingh³, 1 *University of Strathclyde*, 2 *University of Manchester*, 3 *University of the West Indies*

4B-5 Effect of porous metal electrode on water tree propagation
Hiroaki Uehara¹, Takahisa Endo¹, Katsutoshi Kudo², Yuichi Tsuboi³, *1 Kanto Gakuin University, 2 Meiji Univesity, 3 Toshiba Mitsubishi-Electric Industrial Systems Corporation*

4B-6 Influence of AC Voltage Prestressing on AC Electrical-tree Inception of Deteriorated LDPE with Dried Water-tree
Daiki Asai¹, Muneaki Kurimoto¹, Fumitaka Komori², Takeyoshi Kato¹, Toshihisa Funabashi¹, Yasuo Suzuoki¹, *1 Nagoya University, 2 National Institute of Technology, Toba College*

4B-7 The Impact of PTFE Orientation on Electrical Tree Growth
Wang Tao, Wang Jue, Yan Ping, Ran Huijue, *Chinese Academy of Science*

4B-8 The preliminary study of high gradient micro-strip insulator in vacuum
Zun Yang, Meng Wang, Feng Li, Le Xu, Le Zhang, *Institute of Fluid Physics, CAEP*

4B-9 Primary Research on Decomposition Phenomenon of Polymer Material in Vacuum Surface Flashover
Chengyan Ren, Jue Wang, Ping Yan, Rong Xu, Tao Wang, Tao Shao, *Chinese Academy of Sciences, Institute of Electrical Engineering*

4B-10 Effect of Degassing on DC Surface Flashover Property of Spacecraft Polymers
Jiang Wu, Zhenjun Zhang, Weiqun Lei, Yang Jin, Xiaoquan Zheng, *Xi'an Jiaotong University*

4B-11 Flashover Model and its Validation of Polluted Long Insulator Strings under low air pressure
Nan Jing, Li Xuelin, Wan Xiaodong, Xu Tao, Chen Jiaying, Yao Tao, Liu Qin, Li Jin, Cai Lin, Jia Ru, *China Electric Power Research Institute*

5-1 Statistical Analysis of Aging Trends in EPR-insulated Safety Cables Sampled from BWR Containments

Norikazu Fuse, Masaki Kanegami, Hideki Misaka, Hiroya Homma, Tatsuki Okamoto, *Central Research Institute of Electric Power Industry, Toxyo, Japan*

5-2 Prognostic modeling of transformer aging using Bayesian particle filtering
Victoria Catterson, *University of Strathclyde*

5-3 Reduction in Permittivity of Poly(tetrafluoroethylene) due to Tensile Strain
Shuaishuai Liu, Nicola Bowler, *Iowa State University*

5-4 Relation between trapping parameters and ageing based on a new electro-thermo kinetic equation

Hisham Alghamdi, George Chen, *University of Southampton*

5-5 Chemiluminescence Due to Oxidation of Ethylene Propylene Diene Copolymers
Yoshimichi Ohki, Naoshi Hirai, *Waseda University*

5-6 Coherence Function Method of Detection of Axial and Radial Movement of a Coil in a High Voltage transformer

K Shashidhar Reddy¹, Nandith Reddy M¹, Sunny Moses T², M Suryakalavathi³, BP Singh¹, *1 St Martin's Engineering College, 2 St. Martin's Engineering College, 3 JNTUH*

10:00-10:30 Break

10:30-12:30 Session 6 (Poster)

Chair: Yasuhiro Tanaka, University of Tokyo

Co-chair: Virginie Griseri, LAPLACE, Toulouse

Session 6A: Aging, Diagnosis and Modelling

6A-1 Study on the Model Selection of Water Diffusion into Silicone Rubber by NMR and Gravimetric Technique

Yanfeng Gao, Xidong Liang, Zhipeng Yan, Jiafu Wang, Yingyan Liu, *Tsinghua University*

————— **Tuesday, October 21, 2014** —————

8:00-10:00 Session 5 (Oral): Aging, Diagnosis and Measurement techniques

Chair: Eric David, ETS, Montreal

Co-chair: Kaori Fukunaga, Nat Inst of Information and Communications Technology, Tokyo

- 6A-2 Dielectric Response of Oil-paper Insulation Thermal Aging by Organic Acid Catalysis
Lei Yan¹, Yunguang Cui², Qian Peng¹, Dongli Xin², Degang Gan¹, Mengxi Yao², Guangning Wu² *1 State Grid Sichuan Electric Power Company Electric Power Research Institute, 2 Southwest Jiaotong University*
- 6A-3 Simulation and Experimental Research on Thermal Aging Performance of Transformer Insulation Paper
Chao Tang, Song Zhang, Xu Li, Bifeng Xiong, *Southwest University*
- 6A-4 Diagnosis of Turn-to-Turn Insulation Failure of Induction Motor Winding with Aid of Support Vector Machine
Yusuke Yagami¹, Chika Araki¹, Yukio Mizuno¹, Hisahide Nakamura², *1 Nagoya Institute of Technology, 2 TOENEC Corporation*
- 6A-5 Trapping parameters comparison between cable sections from different service conditions by a new trapping-detraping model
Ning Liu¹, George Chen¹, Yang Xu², *1 University of Southampton, 2 Xi'an Jiaotong University*
- 6A-6 Analysis on FRP Rod of Composite Insulators by XPS
Youping Tu, Zhikang Yuan, Kangtai Xu, Shaohe Wang, Zhuo Xu, *North China Electric Power University*
- 6A-7 Insulating and Aging Properties of Transformer Oil-Based TiO₂ Nanofluids
Muhammad Rafiq, Wang Wei, Ma Kaibo, Zhou You, Wang Qi, Li Chengrong, Lv Yuzhen, *North China Electric Power University, Beijing*
- 6A-8 Study on Thermal Aging Oil-Paper& Polymer Insulation based on Acid value test
Dinghua Liu¹, Youping Tu¹, Yiyang Zhou¹, Shaohe Wang¹, Jingjing Chen², *1 North China Electric Power University, 2 Wuxi Division of Jiang Su Electric Power Maintenance Branch Company*
- 6A-9 Analysis of interfacial metal migration into dielectric material subjected to high voltage stress
Marek Florkowski¹, Barbara Florkowska², Andrzej Rybak¹, Pawel Zydron², *1 ABB Corporate Research, 2 University of Science and Technology*
- 6A-10 Evaluation Analysis of XLPE Cable's Electrical Condition
Jiao You¹, Zhidong Jia¹, Yong Wang², Weinan Fan², Ye Yuan¹, Zhicheng Guan¹, *1 Tsinghua University, 2 Guangzhou, Guangdong Province*
- 6A-11 Tensile strength Research of PC and PET under High Temperature in Mineral Oil
Liu Kai¹, Yang Kai², Wang Wei¹, Zhou Kai¹, Lu Jian¹, *1 North China Electric Power University, 2 State Grid Materials Co.Ltd. Beijing*
- 6A-12 Study on the Effect of Corona on Hydrophobicity Recovery Performance of RTV Silicone Rubber and its Failure Criterion
Lei Lan¹, Yifan Liao², Hailiang Lu³, Fuzeng Zhang², Hanliang Wang³, Xiaoqing Yuan³, Xishan Wen³, *1 Chongqing University, 2 China Southern Power Grid Co., Ltd., 3 Wuhan University*
- 6A-13 Effect of Copper Sulphide Properties on Performance of Paper Oil Insulation Under Copper Corrosion
Daisy Flora, Sundara Rajan J, Ravi Kumar A, *Central Power Research Institute*
- 6A-14 Study on Status Assessment of Oil-Paper Insulation Based on Recovery Voltage Method
Shucui Luo, Baojiang Cao, Guangning Wu, Xianlang Li, *Southwest Jiaotong University*
- 6A-15 Effects of Various Solutions on Loss and Recovery of Hydrophobicity of HTV Silicone Rubber
Weining Bao, Yanfeng Gao, Xidong Liang, Yingyan Liu, Jiafu Wang, *Tsinghua University*
- 6A-16 Nondestructive Condition Assessment of Silicone Rubber Composite Insulators
Zhongdong Chen¹, Zhangquan Rao¹, Chunyao Lin¹, Can Chen², Zhidong Jia², Hai Lu², Zhaoxiang Yang², *1 Guangdong Electric Power Research Institute, 2 Tsinghua University*
- 6A-17 Comparative Study between Conventional and Hybrid Solid Insulation Systems
Koutoua Simon Kassi¹, Issouf Fofana¹, Fethi Meghnefi¹, Amidou Bété¹, Zié Yéo², *1 UQAC, 2 Institut National Polytechnique Houphouët Boigny*
- 6A-18 Merging the electro-thermal life model for power cables with the statistical volume enlargement law
Massimo Marzinotto¹, Giovanni Mazzanti², *1 Terna S.P.A., 2 University of Bologna*
- 6A-19 The influence of the accelerated aging procedure on the correlation of electrical and mechanical properties of LV nuclear power plant cables
Luca Verardi, Davide Fabiani, Gian Carlo Montanari, *DEI-LIT, University of Bologna*

6A-20 Electrical aging test and Repetitive Partial Discharge Inception Voltage on Random Wire Wound Winding Insulation

Francesco Guastavino¹, Fabio Porcile¹, Alessandro Ratto¹, Davide Cordano², Giulio Secondo², *1 University of Genova, 2 ABB S.p.A.*

6A-21 A Capacitive Test Method for Cable Insulation Degradation Assessment

Emily Arvia, Robert Sheldon, Nicola Bowler, *Iowa State University*

6A-22 Aging Under Thermal and Electrical Stresses of Recycled PET based Composite Materials

Fouzia Mebarki, Eric David, *ETS Montreal*

Session 6B: High Field Effects and Modelling

6B-1 Electrical Properties and Inner Structures of Composite Material Containing Microvaristor and Semiconductive ZnO

Hidehito Matsuzaki, Toshiyuki Nakano, Hideyasu Ando, Masafumi Takei, *Toshiba Corporation*

6B-2 Prediction of ion flow field at the ground level under HVAC and HVDC hybrid transmission lines

Zhenguo Wang, Tiebing Lu, Xuebao Li, *North China Electric Power University*

6B-3 Study and Analysis of Conduction Mechanisms and Space Charge Accumulation Phenomena under High Applied DC Electric Field in XLPE for HVDC Cable Application

Aurélien Hascoat¹, Jérôme Castellon², Serge Agnel², Wilfried Frelin³, Philippe Egrot³, Pierre Honda⁴, Soraya Ammi⁴, Dominique Leroux⁵, *1 Electricity Of France EDF R&D / South Electronic Institut IES, 2 South Electronic Institute IES, 3 EDF R&D, 4 RTE, 5 Boréal AG*

6B-4 Simulation analysis of surge behaviour of power transformer model winding represented by large number of sections.

Kusumadevi G.H¹, Gurumurthy G.R², *1 Acharya Institute of Technology, 2 The Oxford College of Engineering*

6B-5 Analysis of Positive DC Corona Inception Voltage of Stranded Conductor at Different Altitudes

Xuebao Li¹, Xiang Cui¹, Luxing Zhao², Tiebing Lu¹, Jiayu Lu², Zhenguo Wang¹, *1 North China Electric Power University, Beijing, 2 Electric Power Research Institute, Beijing*

6B-6 Transient Electric field Calculation of UHV GIS Spacer under Lightning Impulse

Haoran Wang, Zongren Peng, Naiyi Li, Shiling Zhang, Zihao Guo, Siyu Zhang, *Xi'an Jiaotong University*

6B-7 High Field Dielectric Properties of Polyethylene Terephthalate

Atsushi Seki, Yuki Koike, Miran Yamamoto, Kazuyuki Tohyama, *National Institute of Technology, Numazu College*

6B-8 Modeling of Electric Stress Control in HV Bushing Using Field Grading Material

Naiyi Li, Zongren Peng, *Xi'an Jiaotong University*

6B-9 Electrical Characteristics during Spark Discharge on Water Surface of Tap Water and Saline Solution with Increased Voltage

Nur Shahida Midi, Ryu-ichiro Ohyama, *Tokai University*

6B-10 Experimental studies on Influence of Different Conductivities on Water Mist Charging with Electrostatic Induction

Ahmed Alharbi, Soban Try, Ryu-ichiro Ohyama, *Tokai University*

6B-11 Experiments on Spatial Emission Distribution in an Ar Atmospheric Pressure Plasma Jet Stream

Yuka Yamada, Tomoha Goto, Ryu-ichiro Ohyama, *Tokai University*

6B-12 Research on AC and Impulse Stress Gradient of Coronaless Stator End-winding for 10kV Explosion-proof Motor

Jing Wang¹, Xuezhong Liu¹, Rui Liang¹, Cong Wei¹, Tianlong Zhang¹, Hongyan Li², Guoqun Tian³, Sheng Zhou², *1 Xi'an Jiaotong University, 2 Zhuzhou Times New Material Technology Co., Ltd., 3 Nanyang Explosion Protection Group Co. Ltd.*

6B-13 Effect of moderate high-voltage on dielectric and relaxation properties of pure polycarbonate

Hugues Couderc¹, Michel Fréchette¹, Eric David², *1 IREQ, 2 École de Technologie Supérieure*

6B-14 Monte - Carlo Simulation of Metallic Particle Movement in an Unenergized Transformer

Vasanth Gowri¹, M Ramlinga Raju², BP Singh³, *1 CBIT, 2 JNTU, 3 St Martin's Engineering College*

Session 6C: Measurement Techniques

- 6C-1 The Effects of Branches on Condition Related Signals in Low Voltage Underground Power Systems
B. Kruizinga¹, P.A.A.F. Wouters¹, E.F. Steennis², *1 Eindhoven University of Technology, 2 DNV GL Energy*
- 6C-2 Analyses of Various Insulating Polymers by Broadband Dielectric Spectroscopy
Yoshimichi Ohki¹, Yuka Hasegawa¹, Junya Takihana¹, Kaori Fukunaga², Maya Mizuno², Kensuke Sasaki², *1 Waseda University, 2 National Institute of Information and Communications Technology*
- 6C-3 Electrical Characterization of Bearing Lubricants
Abhishek Joshi, Jürgen Blennow, *Chalmers University of Technology*
- 6C-4 Analysis and Performance of High Voltage DC Power Supplies Used for Low Current Measurements on Dielectric Materials
Neizar Atiwi¹, Staffan Josefsson¹, Josip Batkovic², Torbjörn Thiringer², *1 Nexans Norway As - R&D, 2 Chalmers University - Division of Electric Power Engineering*
- 6C-5 Insulation Condition Assessment of Power Transformer Bushings by Utilizing High Voltage Lightning Impulses
Roya Nikjoo, Nathaniel Taylor, Hans Edin, *KTH Royal Institute of Technology*
- 6C-6 A Survey of ELCID Applied on Insulation Faults of Stator Cores
Zhengping Zhang¹, Wei Hu¹, Xiaotao Tu¹, Yu Bai², Zhiyang Zeng³, *1 Guangdong Electric Power Research Institute, 2 Guangzhou Power Supply Bureau, Guangzhou, Guangdong, China, 3 Graduate School at Shenzhen, Tsinghua University*
- 6C-7 Determination of Accelerated Electrical Ageing Stresses in Stator Insulation of Wind Turbine Generator Based on Repetitive Impulse Voltage Distributions
Xuezhong Liu¹, Yonggang Bai¹, Rong Liu¹, Shandi Zhang², Guanfang Liu², Chenxing Wang¹, *1 Xi'an Jiaotong University, 2 Yongji Xinshisu Electric Equipment Co., Ltd.*
- 6C-8 Detection of Joule Heating in Polyimide Films at High Electric Field and High Temperature by Infrared Thermography
Sombel Diahm, Guillaume Belijar, Marie-Laure Locatelli, Thierry Lebey, *LAPLACE - Univ. of Toulouse*
- 6C-9 Terahertz pulse-echo imaging of multi-layered dielectric materials and its industrial applications
Kaori Fukunaga¹, Maya Mizuno¹, Tetsuo Fukuchi², Norikazu Fuse², Masakazu Ogasawara³, *1 National Institute of Information and Communications Technology, 2 Central Research Institute of Electric Power Industry, 3 Pioneer Corporation*
- 6C-10 New design of the pulsed electro-acoustic upper electrode for measurements under electron irradiation
Jonathan Riffaud, Virginie Griseri, Laurent Berquez, *Université de Toulouse-LAPLACE*
- 6C-11 Partial Discharge Measurement During Impulse Testing
V. Rodolfo García-Colón, *Instituto de Investigaciones Eléctricas*
- 6C-12 Capacitive Sensing for Degradation Assessment in Bismaleimide/Glass-Fiber Composites
Connor Daily, Robert Sheldon, Vinay Dayal, Nicola Bowler, *Iowa State University*
- 6C-13 AC Electrothermal Micropump for Biofluidic Applications Using Numerous Microelectrode Pairs
Alinaghi Salari¹, Maryam Navi², Colin Dalton¹, *1 University of Calgary, 2 Semnan University*
- 6C-14 A Study of Waveform Recovery in Space Charge Test of PET by PEA Method
Youping Tu¹, Shaohe Wang¹, Jingjing Chen¹, Fuzeng Zhang², Yifan Liao², *1 North China Electric Power University, 2 China Southern Power Grid Co., Ltd*
- 6C-15 The Influence of Dielectric Dissipation Factor on Transformer Frequency Response Analysis
Mehdi Bagheri, B.T. Phung, Trevor Blackburn, *University of New South Wales*
- 6C-16 From Frequency Domain to Temperature Domain of Transformer Liquid Insulation
Diego Robalino¹, Raul Alvarez², *1 MEGGER, 2 Universidad de La Plata*

————— **Wednesday, October 22, 2014** —————

8:00-10:00 Session 7 (Oral): Innovative Insulation

Chair: Paul Lewin, Univ. of Southampton

Co-chair: Jerome Castellon, Univ. of Montpellier

- 7-1 Enhanced Charge Trapping in Bimodal Brush Functionalized Silica-Epoxy Nanocomposite Dielectrics
Timothy Krentz¹, Yanhui Huang¹, J. Keith Nelson¹, Linda Schadler¹, Michael Bell², Brian Beniceswicz², Su Zhao³, Henrik Hillborg³, *1 RPI, 2 University of South Carolina, 3 ABB*
- 7-2 How different fillers affect the thermal conductivity of epoxy composites
I. A. Tsekmes¹, R. Kochetov¹, P.H.F. Morshuis¹, J. Smit¹, T. Iizuka², K. Tatsumi², T. Tanaka², *1 TU Delft, 2 Waseda University*
- 7-3 Effect of water absorption on dielectric properties of nano-silica/polyethylene composites
Ian Hosier¹, Matt Praegar¹, Alun Vaughan¹, Steve Swingler¹, *1 University of Southampton*
- 7-4 Influence of Low Amounts of Nanostructured Silica and Calcium Carbonate Fillers on the Large-Area Dielectric Breakdown Performance of Bi-axially Oriented Polypropylene
Ilkka Rytöluoto¹, Kari Lahti¹, Mikko Karttunen², Matti Koponen², Suvi Virtanen³, Mika Pettersson³, *1 Tampere University of Technology, 2 Technical Research Centre of Finland, 3 University of Jyväskylä*
- 7-5 Nanostructured Epoxy/POSS composites: High Performance Dielectrics with Improved Breakdown Strength and Corona Resistance
Thomas Heid¹, Michel Fréchet², Éric David¹, *1 École de technologie de supérieure, 2 Institute de recherche d'Hydro Québec*
- 7-6 Electric Field Control in Coaxial Disk-Type Solid Insulator by Functionally Graded Materials (FGM)
Junya Ishiguro¹, Muneaki Kurimoto¹, Hiroki Kojima¹, Katsumi Kato², Hitoshi Okubo³, Naoki Hayakawa¹, *1 Nagoya University, 2 National Institute of Technology, Niihama College, 3 Aichi Institute of Technology*

10:00-10:30 Break

10:30-12:30 Session 8 (Poster)

Chair: Alun Vaughan, Univ. of Southampton
Co-chair: Enis Tuncer, Texas Instruments, Dallas

Session 8A: Innovative Insulation

- 8A-1 A Numerical Approach for Analysis of Structure of Voltage-endurance Nanoporous-silica Composite Insulator
Muneaki Kurimoto, Yuu Yamashita, Takeyoshi Kato, Toshihisa Funabashi, Yasuo Suzuoki, *Nagoya University*
- 8A-2 A Way to Prepare Nano-Ag/Epoxy Resin Composite and Study of LSPR in Composite
Wu Kai, Jinhua Dong, Zhihui Shao, Man Ding, *Xi'an Jiaotong University*
- 8A-3 The Effect of Exfoliation on the Breakdown Strength of Polystyrene Boron Nitride Composites
Raed Ayoob, Thomas Andritsch, Alun Vaughan, Yuanye Meng, *University of Southampton*
- 8A-4 On Interfaces and the DC Breakdown Performance of Polyethylene/Silica Nanocomposites
Kwan Yiew Lau¹, Alun Vaughan², George Chen², Ian Hosier², Alex Holt², *1 Universiti Teknologi Malaysia, 2 University of Southampton*
- 8A-5 Electrical Characteristics of PVDF/BTO Nanocomposites under DC Voltage Application
Yoshinobu Murakami, Hidenori Suzuki, Tomohiro Kawashima, Masayuki Nagao, *Toyohashi University of Technology*
- 8A-6 Dielectric Properties of Polyimide/Boron Nitride Nanocomposites at High Temperature
Sombel Diahm, François Saysouk, Marie-Laure Locatelli, Thierry Lebey, *LAPLACE - Univ. of Toulouse*
- 8A-7 Simulation on the Formation of Microvaristor Chains in Liquid Epoxy Resin under Electric Field
Daigo Komesu, Masafumi Mori, Shinji Ishibe, Masahiro Kozako, Masayuki Hikita, *Kyushu Institute of Technology*
- 8A-8 The influence of nanoparticles on partial discharge phenomena in mineral oils
Andrea Cavallini¹, Karthik Radha¹, Carlos Gustavo Azcarraga Ramos², *1 University of Bologna, 2 Instituto de Investigaciones Eléctricas*
- 8A-9 A simple theoretical model for the bulk properties of nanocomposite materials
Matthew Praeger, Thomas Andritsch, Steve Swingler, Alun Vaughan, Tony Davies *High Voltage Laboratory, University of Southampton*

- 8A-10 Surface Analysis of Epoxy/Silica Nanocomposites Eroded by Partial Discharges.
Tomonori Iizuka¹, Yuqing Zhou², Tomoaki Maekawa², Toshikatsu Tanaka¹, Kohei Tatsumi³, *1 Research Center, 2 Graduate School of Information, Production And Systems, 3 Graduate School of Information, Production and Systems, Research Center*
- 8A-11 Barium Titanate and the Dielectric Response of Polystyrene-based Composites
Owen L. Boorman, Ian L. Hosier, Matt Praeger, Russel N. Torah, Alun S. Vaughan, Thomas Andritsch, Steve G. Swingler, James Topham, *University of Southampton*
- 8A-12 Dielectric Studies of Polystyrene-based, High-permittivity Composite Systems
James Topham, Owain Boorman, Ian Hosier, Matthew Praeger, Russel Torah, Alun Vaughan, Thomas Andritsch, Steve Swingler, *University of Southampton*
- 8A-13 The effect of nanosilica on the DC breakdown strength of epoxy-based nanocomposites
R. Kochetov¹, I.A. Tsekmes¹, T. Iizuka², L.A. Chmura¹, P.H.F. Morshuis¹, K. Tatsumi², T. Tanaka², *1 Delft University of Technology, 2 Waseda University*
- 8A-14 Dielectric and Thermal Properties of Submicrometric Epoxy/c-BN Composites
Thomas Heid¹, Michel Fréchet², Éric David¹, *1 École de technologie de supérieure, 2 Institut de recherche d'Hydro Québec*
- 8A-15 Space Charge Evolution in Polypropylene loaded with Synthetic and Natural Nanoclay Aged at 50 °C Temperature
Mahmoud Abou-Dakka, Refat Atef Ghunem, Douglas McIntyre, *National Research Council Canada*
- 8A-16 Space Charge Dynamics in Silica-based Polyethylene Nanocomposites
Yan Wang, George Chen, Alun Vaughan, *University of Southampton*
- 8A-17 Polyethylene-based Nanodielectrics Containing Octaisobutyl Polyhedral Oligomeric Silsesquioxanes Obtained by Solution Blending in Xylene
Meng Guo¹, Michel Fréchet², Éric David¹, Nicole R. Demarquette¹, Jean-Christophe Daigle², *1 École de technologie supérieure (ÉTS), 2 Institut de recherche d'Hydro-Québec (IREQ)*
- 8A-18 Study on the Relation between Particle Dispersion and Dielectric Properties of Nano-Al₂O₃/Silicone Rubber Composites
Ting Yu, peihong Zhang, Jinpeng Gao, *Harbin University of Science and Technology*
- 8A-19 Effects of different nanofillers on the dielectric properties of Epoxy Nanocomposites
Lin Li, Peihong Zhang, Zhongyuan Li, *Harbin University of Science and Technology*
- 8A-20 Research on the Non-linear Permittivity of Nano-Barium Titanate/Silicone Rubber Composites
Jinpeng Gao, Peihong Zhang, Ting Yu, *Harbin University of Science and Technology*
- 8A-21 Prediction of Interface Dielectric Relaxations in Bimodal Brush Functionalized Epoxy Nanodielectrics By Finite Element Analysis Method
Y. Huang¹, Y. Li², T. M. Krentz¹, He Zhao², Ke Wu¹, M. Bell³, B. Benicewicz³, C. M. Breneman¹, J. K. Nelson¹, L. C. Brinson², L. S. Schadler¹, *1 Rensselaer Polytechnic Institute, 2 Northwestern University, 3 University of South Carolina*
- 8A-22 An Investigation of Polyethylene Composites containing Silica Sol-gel Building-blocks
Michel Fréchet¹, Iona Preda², Christele Vanga-Bouanga², Eric David², *1 Hydro-Québec/IREQ, 2 ETS*
- 8A-23 Exploratory dielectric study involving ultra-low content of Si-C-Al in epoxy
Michel Fréchet¹, Iona Preda², Houshang Alamdari³, Paul Lewin⁴, Alex Holt⁴, Thomas Heid⁵, *1 Hydro-Québec/IREQ, 2 ETS, 3 U. Laval, 4 SOTON, 5 ETYS/IREQ*
- 8A-24 Specific Gravity and Dielectric Permittivity Characteristics of Mesoporous-silica/Epoxy Composite
Yuu Yamashita, Muneaki Kurimoto, Takeyoshi Kato, Toshihisa Funabashi, Yasuo Suzuoki, *Nagoya University*
- 8A-25 Ab-initio Modeling of Interfacial Region in Nanocomposite Dielectrics.
Elena Kubyshkina¹, B.L.G. Jonsson¹, Mikael Unge², *1 KTH Royal Institute of technology, 2 ABB Corporate Research*
- 8A-26 Polyethylene/Styrenic Block Copolymer Blends: Morphology and Dielectric Properties
Emna Helal¹, Nicole R. Demarquette¹, Eric David¹, Michel Fréchet², *1 École de Technologie Supérieure, 2 Institut de Recherche d'Hydro-Québec*

8A-27 Surface Degradation and Dielectric Response of Inorganic Fillers in the Polyethylene Matrix

Christele Vanga Bouanga¹, Sylvio Savoie², Michel Fréchette², Éric David¹, *1 École de Technologie Supérieure (ÉTS), 2 Institut de recherche d'Hydro-Québec (IREQ)*

8A-28 Effects of Filler Distribution on Morphology and Thermal Conductivity of Polymer Composites

Christele Vanga Bouanga¹, Sylvio Savoie², Michel Fréchette², Éric David¹, *1 École de Technologie Supérieure (ÉTS), 2 Institut de recherche d'Hydro-Québec (IREQ)*

8A-29 Electrical treeing in LDPE-EVA blend based nanocomposites

Francesco Guastavino¹, Laura Della Giovanna¹, Eugenia Torello¹, Mario Hoyos², Pilar Tiemblo², *1 University of Genova, 2 Institute of Polymer Science and Technology (ICTP-CSIC)*

8A-30 LDPE/EVA nanocomposite lifetime studies

Francesco Guastavino¹, Laura Della Giovanna¹, Eugenia Torello¹, Nuria Garcia², Pilar Tiemblo², *1 University of Genova, 2 Institute of Polymer Science and Technology (ICTP-CSIC)*

8A-31 Dielectric Spectroscopy for Biorenewable Plant Oil-Based Polyurethane

Samy Madbouly¹, Michael Kessler², *1 Iowa State University, 2 Washington State University*

8A-32 Comparative Study for Understanding the Behaviour of Natural Ester with Mineral oil as a Transformer Insulating Liquid

Kapila Bandara, Chandima Ekanayake, Tapan Saha, *The University of Queensland*

8A-33 Feasibility of High Voltage DC 2superconducting cables with extruded warm dielectric

Antonio Morandi¹, Giovanni Mazzanti¹, Massimo Marzinotto², *1 University of Bologna, 2 Terna Spa.*

8A-34 A.C. Breakdown Voltage of Solidified Alcohol Aqueous-Solutions at 77K

Ryohei Tsuchiya, Yuji Muramoto, Noriyuki Shimizu, *Meijo University*

Session 8B: Conduction and Polarization Phenomena

8B-1 Study on Accumulation Mechanism of Space Charge in Covering Insulating Material for Motor Windings

Kaoru Takizawa, Tomoki Sutsugu, Tomoyuki Iwata, Hiroaki Miyake, Yasuhiro Tanaka, Tatsuo Takada, *Tokyo City University*

8B-2 Effect of Heat Treatment on Space Charge Accumulation in Epoxy Resin under High DC Stress

Kikuchi Shunichiro, Mizutani Shunta, Miyake Hiroaki, Tanaka Yasuhiro, *Tokyo City University*

8B-3 Influence of processing on the nonlinear conductive properties of PANi/XLPE and PANi/EPDM composites

Staffan Josefsson¹, Knut Magne Furuheim¹, Jani Pelto², Marjo Ketonen², Outi Härkki², *1 Nexans Norway AS, 2 VTT Technical Research Center of Finland*

8B-4 Electrical and chemical characterisation of thin epoxy layers for high voltage applications

A. Krivda, U. Straumann, M. Martinon, E. Logakis, F. Tsang, M. Narendran, *ABB Switzerland Ltd*

8B-5 Influence of Modifying on the Dielectric and Conductive Properties of Polyimide Composite

Weiqun Lei, Xiaoquan Zheng, Ping Peng, Zhenjun Zhang, Jiang Wu, Yang Jin, *Xi'an Jiaotong University*

8B-6 Electrical Characterisation of Gamma Irradiated Polypropylene

Sarah Mouaci, Nadia Saidi-Amroun, Nassiba Belkahla, Mohamed Saidi, *University, USTHB*

8B-7 The DC field distribution around an HVDC wall bushing

Birgitta Källstrand¹, Daniel Borg¹, David Emilsson², Uno Gäfvert¹, Kenneth Johansson¹, Lars Walfridsson¹, *1 ABB AB, Corporate Research, 2 ABB AB, Components*

8B-8 Effect of water on conductivity of HVDC grade XLPE plate samples

Carl-Olof Olsson¹, Hossein Ghorbani², Birgitta Källstrand¹, *1 ABB Corporate Research Center, 2 ABB High Voltage Cables*

8B-9 Dielectric Properties of Hydroxyl-Terminated Butadiene Nitrile Liquid Rubber Toughened Epoxy Resin Polymer

Chuang Wang, Fanfan Ma, He Li, Jialong Wang, Zongren Peng, *Xi'an Jiaotong University*

8B-10 Study on the Change of Volume Resistivity in the Process of Water Diffusion into HTV Silicone Rubber

Shaohua Li, Yanfeng Gao, Xidong Liang, Jiafu Wang, Yingyan Liu, Tsinghua University

8B-11 Discussion on impedance measurements and bulk ohmic conductivity in lossy dielectrics

Enis Tuncer, Texas Instruments Inc.

8B-12 Space Charge Behaviours in Polyethylene under Combined AC and DC Electric Fields

Churui Zhou, George Chen, University of Southampton

8B-13 The Influence of Frequency of AC Component on Space Charge Behaviours in Polyethylene under Combined AC and DC Electric Fields

Churui Zhou, George Chen, University of Southampton

8B-14 Effect of Dynamic Glass Transition on Space Charge Behavior in Epoxy Resin

Xin Ning, Hongliang Zhang, Hua Feng, Peng Liu, Zongren Peng, Naiyi Li, Xi'an Jiaotong University

8B-15 Unipolar ferroelectrets: Following the example of the electret microphone more closely

Dmitry Rychkov¹, Ruy Alberto Pisani Altafim², Reimund Gerhard¹, 1 University of Potsdam, 2 Federal University of Paraíba

8B-16 Mechanisms for surface potential decay on fluorinated epoxy in high voltage DC applications

Azwadi Mohamad¹, George Chen¹, Zhenlian An², Yewen Zhang², 1 University of Southampton, 2 Tongji University

8B-17 Space charge dynamics in Oil and thick pressboard combined system under polarity reversal voltage

Miao Hao¹, Yuan Zhou¹, George Chen¹, Gordon Wilson², Paul Jarman², 1 University of Southampton, 2 National Grid

8B-18 Space charge patterns under thermal gradient

Hiroaki Uehara¹, Qin Chen², Gian Carlo Montanari³, Yang Cao⁴, 1 Kanto Gakuin University, 2 GE Global Research Center, 3 University of Bologna, 4 University of Connecticut

12:30-14:00 Lunch

14:00-16:00 Session 9 (Oral): Conduction and Polarization Phenomena

Chair: Kai Wu, Xi'an Jiaotong University

Co-chair: Andrea Cavallini, University of Bologna

9-1 Properties of Bruggeman Dielectric Mixture Expression

Enis Tuncer¹, Gunnar A. Niklasson², 1 Texas Instruments Inc., 2 Uppsala University, Sweden

9-2 Simulation of space charge distribution in polyethylene under a temperature gradient

Zepeng Lv¹, Kai Wu¹, Ya Wang¹, Xia Wang¹, Yonghong Cheng¹, Guodong Meng¹, L. A. Dissado², 1 Xi'an Jiaotong University, 2 University of Leicester

9-3 Effects of a modified interface by silver nanoparticles/SiOC:H barrier layer against space charge injection under HVDC

Laurent Milliere¹, Kremena Makasheva^{1,2}, Christian Laurent^{1,2}, Bernard Despax^{1,2}, Laurent Boudou¹, Gilbert Teyssedre^{1,2}, 1 LAPLACE, Universite Paul Sabatier, 2 LAPLACE, CNRS

9-4 A First-Principles Study of Aluminum-Polyethylene Interfaces

Lihua Chen¹, Huan Tran¹, Ahmed Huzayyin², Yenny Cardona Quintero¹, Rampi Ramprasad¹, 1 University of Connecticut, 2 University of Toronto

9-5 Effects of interacting ionic and electronic space charges

Bjoern Martin, Herbert Kliem, Saarland University

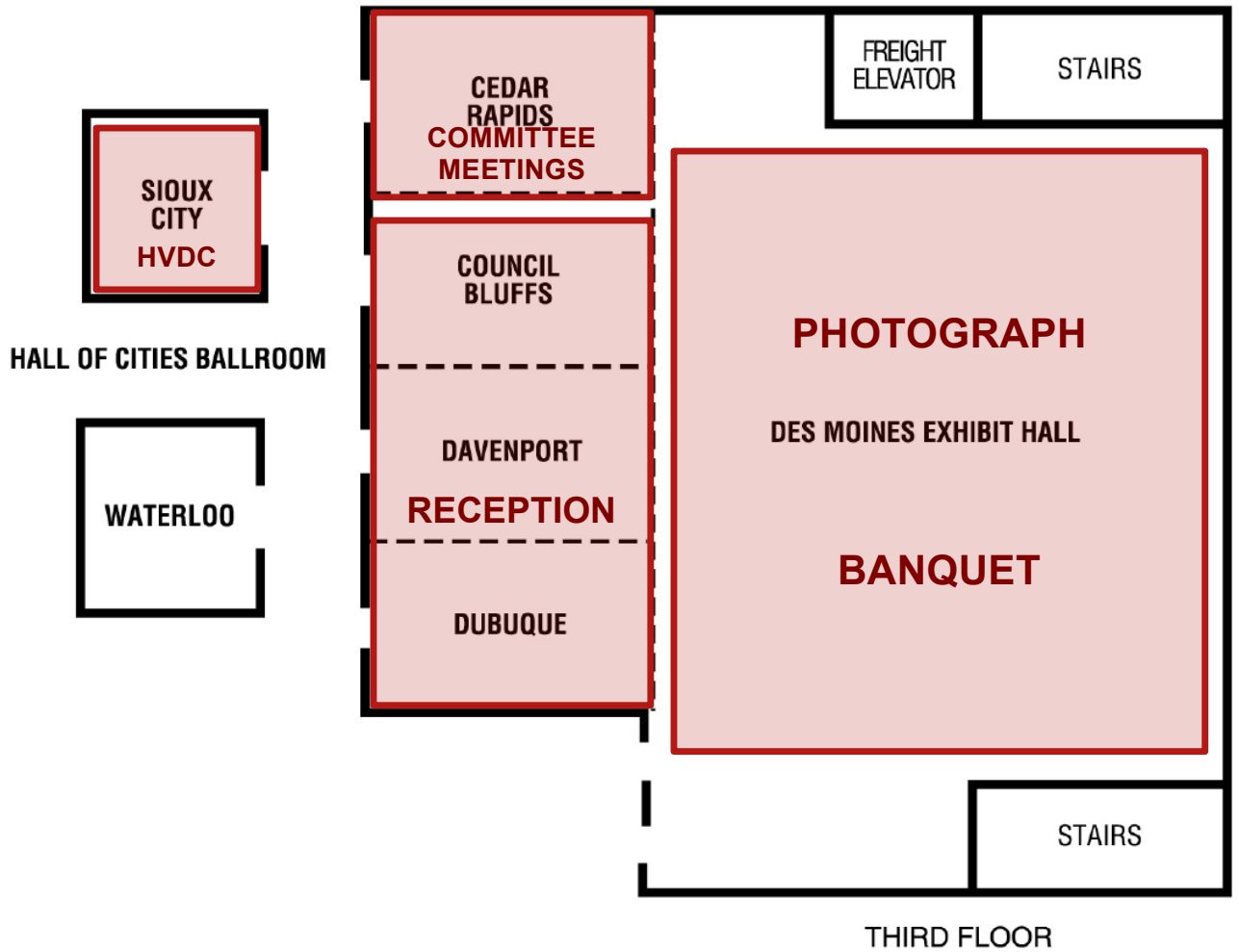
9-6 Depth- and Time-Resolved Polarization Reversal in Poly(vinylidene fluoride-trifluoroethylene)

Ziyang Yu, Axel Mellinger, Central Michigan University

16:00-16:15 Closing

Michel Fréchet, IREQ, Canada

CEIDP 2014 Meeting Rooms – Des Moines Marriott Downtown



IEEE CEIDP 2014 PROGRAM

	SUNDAY	MONDAY	TUESDAY	WEDNESDAY		
8:00	WORKSHOP ON NANODIELECTRICS Salon D	WELCOME	SESSION 5 (ORAL) Salons A-D Aging, Diagnosis and Measurement techniques	SESSION 7 (ORAL) Salons A-D Innovative Insulation		
8:15		WHITEHEAD MEMORIAL LECTURE Salons A-D				
8:30						
8:45						
9:00						
9:15		PHOTOGRAPH Des Moines Exhibit Hall				
9:30						
9:45		SESSION 1 (ORAL) Salons A-D Prebreakdown, Breakdown and Partial Discharges	BREAK	BREAK		
10:00						
10:15						
10:30			SESSION 6 (POSTER) 6A - Aging, Diagnosis and Modelling 6B - High Field Effects and Modelling 6C - Measurement Techniques	SESSION 8 (POSTER) Salons E-H 8A - Innovative Insulation 8B - Conduction and Polarization Phenomena		
10:45						
11:00						
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12:15	LUNCH	LUNCH	LUNCH			
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14:00				SESSION 2 (ORAL) Salons A-D Treeing, Surface Flashover and Outdoor Insulation	1. Technical Tour of Iowa State University's Wind Energy Institute 2. Cultural Tour of Iowa State Capitol Building 3. Free time	SESSION 9 (ORAL) Salons A-D Conduction and Polarization Phenomena
14:15						
14:30						
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15:45	BREAK	CLOSING CEREMONY				
16:00						
16:15						
16:30						
16:45						
17:00	REGISTRATION 2nd Floor Foyer (until 9:00 PM)	SESSION 3 (POSTER) 3A-Prebreakdown and Breakdown in Solids, Liquids, Gases and Vacuum 3B - Partial Discharge Measurements 3C - Biodielectrics				
17:15						
17:30						
17:45						
18:00			DINNER			
18:15						
18:30						
18:45						
19:00	SESSION 4 (POSTER) Salons E-H 4A - Outdoor Insulation 4B - Treeing and Surface Flashover	BANQUET Des Moines Exhibit Hall				
19:15						
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21:00	RECEPTION 3rd Floor					
21:15						