

2004 IEEE CEIDP

**IEEE CONFERENCE ON ELECTRICAL INSULATION AND DIELECTRIC PHENOMENA
Millennium Harvest House Hotel, Boulder, Colorado, USA October 17–20**



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Lynn Hatfield, Texas Tech University, USA
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Victor Moreno, Jet Propulsion Laboratory, USA
Eiichi Nagao, TM T&D Corporation, JAPAN
Gerhard Sessler, University of Technology, Darmstadt, GERMANY
Toshikatsu Tanaka, Waseda University, JAPAN
Brian R. Varlow, University of Manchester, UK

CONFERENCE INFORMATION

The 2004 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; 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 2004 Whitehead Memorial Lecture will be given by Dr. Jean-Pierre Crine on a topic entitled, "*On the interpretation of some electrical aging and relaxation phenomena in solid dielectrics*".

REGISTRATION

All Conference attendees must register for the Conference.

Registration payment on or before September 15, 2004	US \$475
Registration payment after September 15, 2004	US \$525
*Reduced registration on or before September 15, 2004	US \$275
*Reduced registration after September 15, 2004	US \$325

*Reduced registration is offered to students, IEEE life members, persons retired and not gainfully employed, and persons who are currently unemployed.

The Conference registration includes: one copy of the 2004 Annual Report and following social functions: Reception, Sunday, October 17, 2004, 1800-2100; Social hour and banquet, Tuesday, October 19, 2004, 1800-2100; Refreshments served during breaks

Extra banquet tickets may be purchased for spouses and guests.

All fees are due at registration. Payment may be made by check, money order, credit card, or wire transfer. The following credit cards are accepted: American Express, MasterCard, Visa, and Diners Club. All payments are in US

dollars. Checks and money orders drawn on or payable through US banks are accepted. Make checks and money orders payable to IEEE/CEIDP. Wire transfers are payable through Fleet Bank Boston, Massachusetts, USA; IEEE Travel Services; Account Number 8459001469; ABA Number L011000138.

Registration fees are nonrefundable after September 25, 2004. There is a \$75 nonrefundable fee for cancellations received before September 25, 2004.

Conference registration may be submitted on-line at <https://icm3.ieee.org/eventmanager/onlineregistration.asp?eventcode=89z> or by using the registration form available on the Conference web site.

The Conference registration desk will be open during the following hours:

Sunday, October 17, 2004, 1600-2100;
Monday, October 18, 2004, 0800-1600 and 1900-2000;
Tuesday, October 19, 2004, 0800-1200; and
Wednesday, October, 2004, 0800-1200

HOTEL

All sessions and activities of the 2004 IEEE/CEIDP will be held at the Millenium Harvest House Hotel, Boulder, Colorado, USA. The Conference room rate is \$130 per night plus tax for non-government employees and \$93 per night plus tax per for government employees, single/double occupancy. To ensure these rates, your Hotel reservation and deposit must be received by September 17, 2004. Reservations made after September 17, 2004 will be accepted on a space and rate availability basis.

Reservations should be made directly with the Hotel at the following address:

Millenium Harvest House Hotel
1345 28th Street
Boulder, CO 80302-6899
USA
TEL: 800-222-8888 or 303-443-3850 FAX: 303-443-1480

Be sure to mention that you are attending the 2004 IEEE/CEIDP when making your reservation to receive the Conference room rates.

TOURS

Tours are subject to cancellation if there is insufficient interest. Tour fees will be refunded in the event of cancellation.

NIST and NCAR Technical Tour:

Date and time: Tuesday, October 19, 2004, 1230–1700

Fee: \$30 per person

Fee includes: motor coach. A technical tour of the NIST facility and brief tour of the National Center for Atmospheric Research (NCAR) will be provided.

Plan to register early as space is limited. You may pre-register for the Tour on the Conference Registration Site.

The bus will first take the group to the National Center for Atmospheric Research (NCAR) for a 35 minute lunch (at the cost of the attendee) and a quick tour of NCAR. Then we will reload into the bus and head down to NIST to

begin the NIST tour. The NIST Tour will include stops in the dielectrics lab, evanescent and nano-electromagnetic probing lab, nonlinear electromagnetics, and high-frequency calibrations.

All attendees must provide security related information to James Baker-Jarvis at least two weeks prior to the tour date. For NIST security procedures for the tour please send the following information by email to James Baker-Jarvis jjarvis@boulder.nist.gov (303-497-5621)

Name:
Affiliation:
Work address:
Home address:
Date of birth:
Place of birth:
Nationality:
Passport number:
Phone number:
E-mail address:

We must receive this information by Oct. 3, 2004, no exceptions will be made.

Celestial Seasonings Tea Tour and Leanin' Tree

Date and time: Sunday, October 17, 2004, 1000-1500

Fee: \$90.00 per person

Fee includes: motor coach and lunch at the Tea House Restaurant in Boulder

You may pre-register for the Special Tour on the Conference Registration Site.

To begin the day we will travel to Sleepytime Road, home of Celestial Seasonings Tea. The tea company has come a long way since its founder, Mo Siegel, discovered a bountiful harvest of wild herbs growing near Boulder in 1970. We will walk through the Art Gallery to view original paintings depicted on tea boxes by some of the country's most famous illustrators. Guests may also entertain their taste buds with a Tea Sampling or experience the sinus-clearing power of peppermint and spearmint in The Mint Room. We may also enjoy a stroll through the Celestial Herb Garden before heading off to lunch. Next, we will visit Leanin' Tree Museum of Western Art, the world's largest publisher of western, wildlife and other greeting cards of regional interests. The beauty and romance of the West come alive at the Leanin' Tree Museum of Western Art as guests can see one of the nation's largest private collections of Western Art.

For lunch, we will enjoy a delicious meal at The Boulder Tea House in the heart of Boulder's original downtown. In 1987, during his first visit to Boulder, Mayor Maksud Ikramov announced that Dushanbe planned to present our city with a Teahouse to celebrate the establishment of sister city ties. From 1987 -1990, more than 40 artisans in several cities of Tajikistan created the decorative elements our Teahouse, including its hand-carved and hand-painted ceiling, tables, stools, columns, and exterior ceramic panels. The guests will enjoy a unique intimate dining experience that they will not soon forget.

After this stop, we will enjoy a walk around Pearl Street, an outdoor pedestrian mall set in the heart of Boulder's original downtown. Paved over in 1976, it now hosts a diverse mix of restaurants, galleries, bars, cart vendors and tarot card readers along its four-block stretch. At the center of the mall is the County Court House - a popular place for jugglers, magicians and musicians who entertain for tips. Pearl Street Mall is a true depiction of the diversity and beauty for which Boulder is known!

Minimum/ Maximum: (25) Guests/ (45) Guests

Duration/ Transfer: (5) Hours/ (45) Minutes

Special Considerations: No children under 5 years of age.

Recommended Attire: Comfortable walking shoes, casual pants, jacket

TRAVEL

Boulder is located at the eastern edge of the Rocky Mountains, about 70 km (43.5 miles) northwest of the Denver International Airport.

Transportation to and from Denver International Airport (DIA) is available by rental car, limousine shuttles, or bus. Most rental car companies have facilities at DIA. Round-trip and one-way limousine shuttle is available through Super Shuttle Boulder (Phone: 303-444-0808), leaving the airport every hour on the hour, arriving in approximately 70 minutes. The one-way fee is \$19.

A regional bus service, the RTD, provides transportation between DIA and Boulder. Busses leave every hour between 6:20 a.m. 11:20 p.m. with the last bus leaving at 11:20 p.m. Trip time is about 90 minutes with a final stop at the Boulder bus station located at 13th and Walnut Street in downtown Boulder. The one-way RTD fare is \$10. For detailed information click on “Skyride” at: <http://www.rtd-denver.com>. You will probably need to arrange for a taxi to your hotel from the bus station.

Local taxi service is available from Boulder Yellow Cab (303-442-2277)

Directions from Denver International Airport via the new tollway (Northwest Parkway)

This route is much faster, with less traffic than the I-70 route listed below. Exit the airport via Pena Boulevard to E-470 and turn right. E-470 will turn into the Northwest Parkway. Take the Northwest Parkway west to U.S. Hwy 36. At the end of the Northwest Parkway, exit onto U.S. Hwy 36 West to Boulder. The entire toll from the airport to the hotel is \$5.25 The toll map is located at: <http://www.northwestparkway.org/maps/ExpressTollmap.pdf>

To reach the hotel, stay on US-36 (this becomes 28th Street.) The hotel is located on the left hand side, 200 yards past the first traffic light.

Alternative driving directions from Denver International Airport:

Exit airport via Pena Boulevard; Merge onto I-70 West to Denver. Take I-70 West to I-25 North, to US 36 West to Boulder. Once on US-36, it will be about a 20-minute drive to Boulder. As you enter Boulder, Highway 36 will turn into 28th street. The Millennium Hotel is located on the left hand side, 200 yards past the first traffic light. The Millennium Harvest House Hotel is approximately 1.5 miles away from NIST (about a 25 minute walk)

SPOUSE AND GUEST PROGRAMS

Information on local attractions will be provided at the registration desk.

AUTHOR SUPPORT

The CEIDP is able to provide limited support to authors. Inquiries should be sent to [Vishnu Lakdawala](mailto:vlakdawa@odu.edu) at vlakdawa@odu.edu, Conference Chair, by July 31, 2004.

STUDENT SUPPORT

The CEIDP provides a limited number of stipends in the amount of US \$300 to full-time students to encourage their participation in the Conference. The stipend is contingent upon the following conditions: 1) the student must be an author or coauthor of a paper accepted for presentation at the Conference, and 2) the student must present or co-

present the paper at the Conference. The CEIDP reserves the right to limit the number of student stipends allocated to a single research group or institution. To apply for a student stipend, the following information should be sent by e-mail message to [Vishnu Lakdawala](mailto:Vishnu.Lakdawala), Conference Chair, by June 30, 2004.

IEEE/DEIS TECHNICAL MEETINGS

DEIS committee chairs planning to hold meetings during the Conference should contact Isidor Sauers prior to the Conference. Limited meeting space is available and requests for space will be honored in the order that they are received.

2004 ANNUAL REPORT

One copy of the 2004 Annual report is provided with the registration. While supplies last, additional copies may be obtained at the Conference at a cost of US \$ 80 each. Following the Conference, the Annual Report is available from:

IEEE Service Center
Single Publication Sales Department
445 Hoes Lane
Piscataway, NJ 08854
USA
Tel: 800-675-4333
Fax: 732-981-9667

WORKSHOP ON HIGH-FREQUENCY DIELECTRIC MEASUREMENTS

A special Workshop on High Frequency Dielectric Measurements will be held in conjunction with the 2004 CEIDP on Sunday, October 17, 0900–1300 at the Millennium Hotel. This workshop will have 6 invited speakers who will cover topics from high-frequency dielectric measurements to dielectric-relaxation theory (MHz to GHz frequencies).

Registration: The Workshop on High-Frequency Measurements is open to all Conference participants and guests. There is registration fee of \$50 per person.

You may pre-register for the Workshop on the Conference Registration Site. Pre-registration is encouraged but not required. For further information contact: Richard Geyer (geyer@boulder.nist.gov), 303-497-5852.

2004 IEEE CONFERENCE ON ELECTRICAL INSULATION AND DIELECTRIC PHENOMENA

————— Sunday, October 17 —————

- 0900-1300 High-Frequency Dielectric Measurements Workshop**
- 1000-1500 Celestial Seasonings Tea Tour and Leanin' Tree**
- 1600-2100 Registration**
- 1800-2100 Reception (Cash bar)**

————— Monday, October 18 —————

0800-0815 Welcome

Vishnu K. Lakdawala, Conference Chair,
Old Dominion University, USA

0815-0930 The Whitehead Lecture

On the interpretation of some electrical aging and relaxation phenomena in solid dielectrics
Jean-Pierre Crine, Consultant, St-Bruno, QC, Canada

0930-1000 Break (Refreshments)

1000-1230 Session 1 General I (Oral)

Chair: Victor Moreno, Jet Propulsion Laboratory, USA
Organizer: Ravi Gorur, Arizona State University Main, USA

1-1 Broadband dielectric measurement of liquids

James Baker-Jarvis¹, Michael D. Janezic¹, and Jerzy Krupka²
¹National Institute of Standards and Technology, Boulder, USA
²University of Warsaw, Poland

1-2 Optically based partial discharge continuous monitoring system for HV cable joints

Y Tian¹, P L Lewin¹, J S Wilkinson², S J Sutton³ and S G Swingler¹
¹The Tony Davies High Voltage Laboratory, University of Southampton, Hampshire, UK
²The Optoelectronics Research Centre, University of Southampton, UK
³National Grid Transco plc, Warwickshire, UK

1-3 The I-V characteristics of SiO₂ after ultra high temperature diffusion

Nung-Pyo Hong
Fairchild Semiconductor Korea Ltd., Bucheon-city, Gyeonggi-do, KOREA

1-4 Modelling of space charge, electroluminescence and current in low density polyethylene under DC and AC field
S. Le Roy¹, G. Teyssedre¹, P. Segur² and C. Laurent¹
¹ Laboratoire de Génie Electrique de Toulouse (LGET), Toulouse, France
² Centre de Physique des Plasmas et de leurs Applications de Toulouse (CPAT), Toulouse, France

1-5 Space charge dynamics in polypropylene
T. Mizutani¹, E. Nakane¹, K. Kaneko¹ and M. Ishioka²
¹ Department of Electrical Engineering and Computer Science, Nagoya University, Japan
² Japan Polychem Corporation, Japan

1-6 Flashover performance of EHV station post insulators covered with ice
M. Farzaneh, J. Farzaneh-Dehkordi and J. Zhang
NSERC/Hydro-Quebec/UQAC Industrial Chair on Atmospheric Icing of Power Network Equipment (CIGELE) and Canada Research Chair on Engineering of Power Network Atmospheric Icing (INGIVRE) Université du Québec à Chicoutimi Chicoutimi, QC, Canada

1-7 New aging model for 15kV XLPE distribution cables
S. B. Dalal¹, R. S. Gorur¹ and M. L. Dyer²
¹ Arizona State University, Tempe, AZ, USA
² Salt River Project, Phoenix, AZ, USA

1230-1400 Lunch Break

1400-1600 Session 2 (Poster)

1500-1600 Refreshments

1400-1600 2A Charge Storage and Transport

Chair: T. Tanaka, Waseda University, JAPAN
Organizer: G.R. Govinda Raju, University of Windsor, CANADA

2A-1 Space charge behaviour of epoxy composites for printed circuit boards
K. Fukunaga¹, K. Okamoto² and T. Maeno¹
¹ National Institute of Information and Communications Technology, Tokyo, Japan
² Fuji Electric Advanced Technology, Tokyo, Japan

2A-2 Effect of glass transition on conduction current in biodegradable poly-L-lactic acid
Y. Maeno¹, Y. Yamaguchi¹, N. Hirai¹, T. Tanaka², Y. Ohki¹, Y. Tajitsu³, M. Kohtoh⁴, and S. Okabe⁴
¹ Department of EEBS, Waseda University, Tokyo, Japan
² Graduate School of IPS, Waseda University, Fukuoka, Japan
³ Graduate School of EE, Kansai University, Osaka, Japan
⁴ R&D Center, Tokyo Electric Power Company, Kanagawa, Japan

2A-3 Electro-mechanical properties of soft composite materials
Enis Tuncer, Michael Wegener and Reimund Gerhard-Multhaupt
Applied Condensed-Matter Physics, University of Potsdam, D-14469 Potsdam Germany

- 2A-4 Investigation of space charge behavior in polyimide film during elevating temperature**
S.Sato, S.Yanagisawa, Y.Tanaka, T.Takada, R.Watanabe, N.Tomita¹
¹Musashi Institute of Technology, Japan
- 2A-5 Development of new PEA system using open upper electrode**
S.Imai¹, Y.Tanaka¹, T.Fukao¹, T.Takada¹ and T.Maeno²
¹Musashi Institute of Technology, Tokyo, Japan
²National Institute of Information and Communications Technology, Tokyo, Japan
- 2A-6 Influence of annealing method on the space charge properties in polyethylene**
Ninghua Wang¹, Yuanxiang Zhou¹, Hongbin Liu¹, Bin Gao¹, Xidong Liang¹, Zhicheng Guan¹,
Tatsuo Takada²
¹State Key Laboratory of Control and Simulation of Power System and Generation Equipment,
Department of Electrical Engineering, Tsinghua University, Beijing, China, 100084
²Electronic Measurement Laboratory, Musashi Institute of Technology, Tokyo, Japan, 158-8557
- 2A-7 Millisecond-time range analysis of space charge distribution and electroluminescence in PE and PEN under transient electric stress**
M. Fukuma¹, G. Teyssedre², K. Fukunaga³ and C. Laurent²
¹Matsue National College of Technology, Department of Electrical Engineering 14-4,
Nishiikuma, Shimane, Matsue, 690-8518, Japan
²Laboratoire de Génie Electrique de Toulouse, UMR CNRS 5003 Université Paul Sabatier, 118,
route de Narbonne, 31062, Toulouse, France
³Communication Research Laboratory 4-2-1,Nukuikita, Koganei, Tokyo, 184-8795, Japan
- 2A-8 Charging of PE and XLPE specimens: Effect of antioxidant and cross-linking on luminescence features, space charge and conduction current measurements**
G. C. Montanari¹, G. Teyssedre², C. Laurent², A. Campus³, U.H. Nilsson³, A. Smedberg³
¹University of Bologna, Department of Electrical Engineering
Viale Risorgimento 2, Bologna, 40136, Italy
²Paul Sabatier University, Laboratoire de Genie Electrique de Toulouse
118, route de Narbonne, Toulouse, 31062, France
³Borealis A.B., Stenungsund, Sweden
- 2A-9 Space charge in polyethylene under AC electric stress using the pulsed electroacoustic method**
Y.L. Chong¹, H. Miyake², Y. Tanaka², T. Takada², H. Nakama² and G. Chen¹
¹School of Electronics & Computer Science, University of Southampton, UK
²electronics Measurement Laboratory, Musashi Institute Of Technology, Tokyo, Japan
- 2A-10 Effect of ac ageing on space charge evolution in XLPE**
Y.L. Chong¹, G. Chen¹, H. Miyake², Y. Tanaka², and T. Takada²,
¹School of Electronics & Computer Science, University of Southampton, UK
²Electronics Measurement Laboratory, Musashi Institute of Technology, Tokyo, Japan
- 2A-11 Some experiments about the triboelectric performances of composite textiles**
F. Guastavino, G. Coletti*, A. Dardano, E. Torello
University of Genova, Electrical Engineering Department Via Opera Pia 11A, 16145 Genova,
Italy
- 2A-12 Measurement of internal charge distribution in electric double layer capacitor by PEA method**
D.Tashima, Y.Hirata, M.Otsubo, C.Honda, T.Bouno
University of Miyazaki, 1-1, Gakuenkibanadai-Nishi, Miyazaki 889-2192, Japan

- 2A-13 Space charge and polarization in crosslinked polyethylene**
 T.Pawlowski¹, S.B.Lang² and R.J.Fleming¹
¹School of Physics and Materials Engineering, Monash University, Australia
²Ben-Gurion University of the Negev, Israel
- 2A-14 Analysis of ferroelectric characteristics and HV pulse experiments on X7R ceramic capacitors**
 Ling Dai, Fuchang Lin, Zhifang Zhu, Jin Li
 Lab. of High Voltage, Huazhong University of Science & Technology
 Wuhan, Hubei, China, 430074
- 2A-15 Conduction current measurements on XLPE and EPR insulation**
 R. Bodega¹, G.C. Montanari², P.H.F. Morshuis¹
¹Delft University of Technology, HV Technology & Management
 Mekelweg 4, 2600GA Delft, The Netherlands
²University of Bologna, Department of Electrical Engineering,
 Viale Risorgimento 2, Bologna, 40136, Italy
- 2A-16 Numerical simulation and optimization of electrostatic air pumps**
 N. E. Jewell-Larsen, D. A. Parker, I. A. Krichtafovitch*, and A. V. Mamishev
 Kronos Air Technologies, Redmond, WA 98052, USA
 Sensors, Energy, and Automation Lab (SEAL), University of Washington, Seattle, WA 98105,
 USA

1400-1600 **2B Electrohydrodynamics**

Chair: P.Basappa, Norfolk State University, USA
 Organizer: Teruyoshi Mizutani, Nagoya University, JAPAN

- 2B-1 Effects of dielectric liquids in electrical alternating fields**
 M. Muhr, Pack S., Schwarz R., Koerbler B.
 Graz University of Technology, Austria
- 2B-2 An experimental study on neutralization of non-thermal plasma oxidized diesel engine combustion exhaust NO_x gases with hydrated lime filter**
 T.Goto and R.Ohyama
 Department of Electrical Engineering, Tokai University, Kitakaname, Hiratsuka, Kanagawa,
 JAPAN
- 2B-3 The electric pressure jump in the hydraulic model in a non-ohmic/non-ohmic fluid interface**
 F.VegaReyes^{1,2} and A.Castellanos¹
¹Dpto. De Electronica y Electromagnetismo, Facultad de Fisica, Spain
- 2B-4 Numerical simulation of two-dimensional EHD plumes mixing finite element and particle methods**
 P.A. Vazquez^{1,2}, C. Soria¹, and A.Castellanos¹
¹Dpto. De Electronica y Electromagnetismo, Facultad de Fisica Avda. Reina Mercedes s/n, 41012
 Sevilla, Spain.
²Dpto. De Fisica Aplicada III, E.S.I. Camino de los Descubrimientos s/n, 41092 Sevilla, Spain

2B-5 An experimental study on electrohydrodynamically induced silicon oil vapor flow under DC corona discharge

R.Ohyama and M.Fukumoto

Dept. of Electrical Eng., Tokai University, Kanagawa, JAPAN

2B-6 An experimental NO_x treatment in diesel engine combustion exhaust gases by non-thermal plasma and activated carbon filter combinations

T.Koizumi, R.Ohyama and S.Okabe

Department of Electrical Engineering, Tokai University, Hiratsuka, Kanagawa, JAPAN

1400-1600 2B Flow Electrification

2B-7 Streaming electrification of liquid nitrogen flowing through electrical insulating pipe

Y. Mizuno, H. Okada, T. Noda¹ and A. Minoda²

¹Nagoya Institute of Technology, Nagoya, Aichi, Japan

²Matsue National College of Technology, Matsue, Shimane, Japan

2B-8 Charge behavior in flowing charged oil in transformer oil duct

H. Okubo¹, M. Wakamatsu¹, K. Nakamura¹, K. Kato¹ and H. Koide²

¹Nagoya University, Nagoya, JAPAN

²Japan AE Power Systems Corporation, Chiba, JAPAN

1400-1600 2B High Frequency Dielectric Phenomena

2B-9 A double negative (DNG) index composite structure from non-conducting material with an application to controllable surfaces

Christopher L. Holloway¹, Edward F. Kuester², James Baker-Jarvis¹, Pavel Kabos¹, and Mohamed Mohamed²

¹National Institute of Standards and Technology, Boulder, CO, USA

²University of Colorado, Boulder, CO, USA

2B-10 Lifetime characteristics of magnet wires under pulse voltage

S. Grzybowski¹, S. Bandaru¹, N. Kota¹, and C. F. King²

¹Mississippi State University, MS, USA

²Sandia National Laboratories CA, USA

1400-1600 2B Polarization Phenomena

2B-11 Influence of space charges in the dielectric response measurement of silicone rubber

D. H. Nguyen¹, A. Sylvestre¹, O. Lesaint¹, S. Rowe²

¹Lab. for Electrostatics and Dielectric Materials (LEMD) (CNRS) and Joseph Fourier University (UJF), BP 166, 38042 Grenoble, Cedex 9, France

²SCHNEIDER ELECTRIC INDUSTRIES S.A, DRM, 38050 GRENOBLE, FRANCE

2B-12 Effect of gas expansion on charging behavior of quasi-piezoelectric cellular PP

G.C. Montanari¹, G. Mazzanti¹, F. Ciani², M. Paaajanen³

¹DIE-LIMAT, University of Bologna, Italy

²TechImp SrL, Bologna, Italy

³VTT Processes, Tampere, Finland

- 2B-13 Filler treatment effects on the dielectric properties of a filled epoxy resin**
J.P. Adohi^{1,3}, C. Guillermin^{1,2}, P. Rain¹, S.W. Rowe²
¹Laboratoire d'Electrostatique et de Matériaux Diélectriques, CNRS-UJF, Grenoble, France.
² Schneider Electric Industries S.A.S, Grenoble, France
³ UFR SSMT, Université de Cocody, Abidjan, Côte d'Ivoire

- 2B-14 Transformation of time domain spectroscopy data to frequency domain data for impregnated pressboard**
A. A. Shayegani¹, H. Borsi¹, E. Gockenbach¹ and H. Mohseni²
¹Division of High Voltage Engineering, Schering-Institut, University of Hannover, Hannover, Germany
²High Voltage Laboratory, University of Tehran, Tehran, Iran

1600-1900 Dinner Break

1900-2100 Session 3 (Poster)

1900-2100 Refreshments

1900-2100 3A Measurement Techniques

Chair: Ruy Alberto C. Altafim, University of Sao Paulo, BRAZIL
Organizer: Ken Stricklett, National Institute of Standards and Technology, USA

- 3A-1 Denoising UHF signal for PD detection in transformers based on wavelet technique**
L. Yang, M. D. Judd and C. J. Bennoch
Institute for Energy and Environment, University of Strathclyde, Glasgow, Scotland, UK
- 3A-2 Measurement of neutral currents in a power transformer and fault detection using wavelet techniques**
A. Bhoomaiah, P. Krishna Reddy¹, K.S.Linga Murthy¹, P. Applu Naidu², B.P. Singh
BHEL R&D, Hyderabad, Andhra Pradesh, India
¹Andhra University, Viskhapatnam, Andhra Pradesh, India
JNTU, Hyderabad, Andhra Pradesh, India
- 3A-3 Electrical material property measurements using a free-field, ultra-wideband system**
C. A. Grosvenor¹, R. Johnk¹, D. Novotny¹, S. Canales¹, J. Baker-Jarvis¹, M. Janezic¹
¹National Institute of Standards and Technology, Boulder, CO 80305
²University of Missouri-Rolla, Rolla, MO 65401
- 3A-4 Utilisation of voltage and frequency dependence of stress-grading materials in dielectric diagnostics**
N. Taylor and H. Edin
Dept. of Electrical Engineering, Royal Institute of Technology, Stockholm, Sweden
- 3A-5 Response of an annular electrostatic probe for a planar dielectric spacer: II**
T. Johansson and I. W. McAllister
Ørsted•DTU
Technical University of Denmark, Lyngby, Denmark

- 3A-6 Frequency response analysis approach for condition monitoring of transformer**
Pradeep M. Nirgude¹ B. Gunasekaran¹, Channa Keshava¹ A. D. Rajkumar² B. P. Singh³
¹Central Power Research Institute, Hyderabad, India
²Osmania University, Hyderabad, India
³BHEL R&D, Hyderabad, India
- 3A-7 Investigation and verification of mixture dielectric properties of polar liquid mixture**
M. Ashraf Hossain
Department of Electrical and Computer Engineering
University of Windsor, Windsor, ON, Canada
- 3A-8 New method for visualizing three-dimensional electromagnetic power absorption by capsule liquid crystal dispersed in transparency high-molecular gel phantom**
Y. Suzuki¹, M. Baba¹, M. Taki¹, K. Fukunaga² and S. Watanabe²
¹Tokyo Metropolitan University, Hachioji, Tokyo, Japan
²National Institute of Information and Communications Technology, Koganei, Tokyo, Japan
- 3A-9 Solution of the LMM equation by the polynomial regularization method and the L-curve algorithm for selection of the regularization parameter**
Sidney B. Lang, Robert Fleming and Tadeusz Pawlowski
School of Physics and Materials Engineering
- 3A-10 Switching surge tests in windings**
A.Palani¹, V.Jayashankar¹, S.Usa² S.Venketesh² K.Udayakumar²
¹Indian Institute of Technology, Madras, Chennai, INDIA
²High Voltage Lab, ANNA University, Chennai, INDIA
- 3A-11 Development of a measurement technique for high frequency characterization of insulation materials**
G. Mugala¹, P. Pettesson² and R. Eriksson¹
¹Royal Institute of Technology, Stockholm, Sweden
²Vattenfall Utveckling AB, Stockholm, Sweden
- 3A-12 Couplers for on-line time domain reflectometry diagnostics of power cables**
V. Dubickas and H. Edin
Department of Electrical Engineering, Royal Institute of Technology, Stockholm, Sweden
- 3A-13 A diagnosis of the electrical insulation of a power plant generator by space charge measurements**
J. Castellon¹, S. Agnel¹, A. Toureille¹, G. Platbrood² and J. Van Cotthem²
¹Laboratoire d'Electrotechnique de Montpellier
Université Montpellier II (Sciences et Techniques du Languedoc)
Place Eugène Bataillon, Case Courrier 079
34095 MONTPELLIER CEDEX 5 FRANCE
²LABORELEC (Belgium)
Rodestraat 125-B-1630 Linkebeek-Belgium

1900-2100 3B Aging

Chair: Brian R. Varlow, University of Manchester, UK

Organizers: R. Anthony Fouracre, University of Strathclyde, UK and
Noriyuki Shimizu, Meijo University, JAPAN

- 3B-1 Criteria for estimation of end of life of power and station transformers in service**
M. K. Pradhan and T. S. Ramu,
Department of High Voltage Engineering
Indian Institute of Science, Bangalore (INDIA)
- 3B-2 Development of generator stator coil with 22kV global VPI insulation**
Akinobu Nakayama, Hohji Haga and Masayoshi Muraoka
Generator & Motor Dept., Kawasaki Factory, Fuji Electric Systems Co., Ltd.
1-1, Tanabeshinden, Kawasaki-ku, Kawasaki-city 210-9530, JAPAN
- 3B-3 Diagnostics of the tree-inception in LDPE**
O.S. Gefle¹, S.M. Lebedev¹, E.I. Cherkashina¹, O.V. Golenko², V.Y. Lavrov² and A.A. Kolesnikov²
¹Tomsk Polytechnic University, Tomsk, Russia
²Novosibirsk State Technical University, Novosibirsk, Russia
- 3B-4 Aging behaviour of cross-linked polyethylene (XLPE) as an insulating material for high (HV) - and extra-high voltage cables (EHV)**
M. Muhr, E. Neges, R. Woschitz, Ch. Sumereder
Institute of High Voltage Engineering and System Management,
Graz University of Technology, Austria, Inffeldgasse 18, A-8010 Graz
- 3B-5 Relationship between surface discharge of polbuschel-type in an artificial void and pit formation**
Kuniharu Imai
Nagoya University, Nagoya, JAPAN
- 3B-6 Aging effect of UV radiation on SIR insulators' hydrophobicity property**
Xun Wang, Xidong Liang and Yuanxiang Zhou
State Key Laboratory of Control and Simulation of Power System and Generation Equipment,
Department of Electrical Engineering, Tsinghua University, Beijing 100084, China
- 3B-7 Synthetic furfural analysis for transformer ageing**
Ming Dong, Guanjun Zhang, and Zhang Yan
Xi'an Jiaotong University, P. R. China
- 3B-8 Threshold of space charge injection and electroluminescence in polymeric insulation**
D. Mary¹, C. Laurent¹, G. Teyssedre¹, and S. Bamji², A. Bulinski², M. Abou Dakka² and L. Cissé²
¹Laboratoire de Génie Electrique de Toulouse Conseil national de la recherche scientifique
Université Paul Sabatier
²National Research Council of Canada
- 3B-9 Solubility of carboxylic acids in paper (kraft)-oil insulation systems**
S. Ingebrigtsen¹, M. Dahlund², W. Hansen¹, D. Linhjell¹, L. E. Lundgaard¹
¹SINTEF Energy Research AS, Trondheim, Norway
²ABB Power Technologies AB, Ludvika, Sweden

- 3B-10 Anisotropy of the dielectric properties of laminated epoxy insulation subjected to water absorption**
T. Pham Hong¹, O. Lesaint¹, P. Gonon¹ and H. Debruyne²
¹Laboratoire d'Electrostatique et de Matériaux Diélectriques (LEMD)
French National Center for Scientific Research (CNRS) and University of Grenoble (UJF)
²Electricité de France (EDF), R&D Department
- 3B-11 Dielectric response of oil-impregnated paper insulation: Variation with humidity and ageing level**
D. Linhjell¹, U. Gøvert² and L. E. Lundgaard¹
¹SINTEF Energy Research, Trondheim, Norway
²ABB Corporate Research, Västerås, Sweden
- 3B-12 Synergic phenomena of multistress aged XLPE-cable insulation investigated by the evaluation of depolarisation current measurements and nuclear magnetic resonance**
M. Reuter¹, E. Gockenbach¹, H. Borsi¹, K. Kremer², B. Blümich²
¹Institute of Electric Power Systems, Division of High Voltage Engineering (Schering-Institute) University of Hannover, Callinstr. 25 A, D-30167 Hannover, Germany
²Institute of Technical Chemistry and Macromolecular Chemistry RWTH Aachen University, Worringer Weg 1, D-52056 Aachen, Germany
- 3B-13 Partial discharge and dielectric response behavior of insulation systems for high voltage rotating machines under electrical stress**
M. Farahani¹, H. Borsi¹, E. Gockenbach¹, M. Kaufhold²
¹Institute of Electric Power Systems, Division of High Voltage Engineering (Schering-Institute) University of Hanover, Hanover, Germany
²Siemens AG, A&D Large Drives, Nürnberg, Germany
- 3B-14 Space charge measurements, dielectric spectroscopy and breakdown tests on new and aged polycarbonate**
B. Aljagic-Jonuz, P.H.F. Morshuis, J.J. Smit
Delft University of Technology, Faculty of Electrical Engineering, Mathematics and Computer Science
Delft, The Netherlands
- 3B-15 Compensation law in several polymer relaxations**
Jean-Pierre Crine
St-Bruno, QC, Canada J3V 1P6
- 3B-16 A tentative model for the electrical aging of the insulation of rotating machines**
Jean-Pierre Crine¹, Laurent Lamarre²,
¹Consultant, St-Bruno, QC, Canada
²IREQ, Varennes, QC, Canada
- 3B-17 Partial discharge and accelerated pulsed aging of insulation between parallel plane-plane stainless steel electrodes and between Bi-Sr-Ca-Cu-O tapes at room temperature**
R. Grabovickic¹, D. R. James¹, I. Sauers¹, A. R. Ellis¹, P. C. Irwin², K. Weeber², L. Li², A. D. Gadre²
¹Oak Ridge National Laboratory, Oak Ridge, TN 37831, USA
²General Electric Global Research Center, Niskayuna, NY 12309, USA
- 3B-18 Application of optical diagnosis to aged low-voltage cable insulation in nuclear plants**
Y. Takezawa, J. Katagiri and H. Shoji
¹Hitachi Research Laboratory, Hitachi, Ltd., 7-1-1 Omika-cho, Hitachi-shi, Ibaraki-ken, 319-1292 JAPAN

1900-2100 3B Treeing

3B-19 The effect of tape overlappings in winding insulations on tree growth and breakdown time

R. Vogelsang¹, R.Brütsch² and K. Fröhlich¹

¹High Voltage Laboratory of the Swiss Federal Institute of Technology Zurich, Switzerland

²Swiss Insulation Works Von Roll Isola, Breitenbach, Switzerland

3B-20 Influence of degradation on electroluminescence in polyethylene

A. Tanida*, Y. Muramoto, N. Shimizu

Meijo University, Electrical and Electronic Eng, Tempaku, Nagoya, 468-8502, Japan

3B-21 Inception and propagation of electrical tree from water tree degradation

Y. Suzuoki¹, T. Saito¹, M. Morita¹, F. Komori², K. Wu³, T. Kato¹ and K. Uchida⁴

¹Nagoya University, Nagoya, JAPAN

²Toba National College of Maritime Technology, Toba, Mie, JAPAN

³Central Research Institute of Electric Power Industry, Yokosuka, Kanagawa, JAPAN

⁴Chubu Electric Power Company, Odaka, Midori, Nagoya, JAPAN

3B-22 Electrical treeing studies on the araldite LY/HY 5052 epoxy resin over a wide range of stressing voltage

H. Z. Ding and B. R. Varlow

University of Manchester, School of Engineering, Manchester, M13 9PL, UK

————— Tuesday, October 19 —————

0800-1000 Session 4 Nanodielectrics (Oral)

Chair: Eiichi Nagoa, TM T&D Corporation, JAPAN

Organizer: Michel Fréchette, Institut de recherche d'Hydro-Québec (IREQ), CANADA

4-1 Simulating nanodielectric composites using the method of local fields

M. Kuehn and H. Kliem

Institute of Electrical Engineering Physics, Saarland University, GERMANY

4-2 The role of the interface in determining the dielectric properties of nanocomposites

J. K. Nelson¹, L. A. Utracki², R.K. MacCrone¹ and C. W. Reed¹

¹Dept. of Electrical, Computer and Systems Engineering,

²Industrial Materials Institute, Rensselaer Polytechnic Institute, Troy, NY, USA

National Research Council, Montreal, CANADA

4-3 Microscopic and nanoscopic EVA composite investigation: Electrical properties and effect of purification treatment

G.C. Montanari¹, A. Cavallini¹, F. Guastavino², G. Coletti², R. Schifani³, M. di Lorenzo del

Casale³, G. Camino⁴, F. Deorsola⁴

¹DIE-LIMAT, University of Bologna, ITALY

²DIE, University of Genova, ITALY

³DIE, University of Palermo, ITALY

⁴Politecnico di Torino, ITALY

- 4-4 Possible mechanism of superior partial-discharge resistance of polyamide nanocomposites**
 N. Fuse¹, M. Kozako², T. Tanaka², S. Murase³, and Y. Ohki¹
¹Waseda University, Shinjuku-ku 169-8555, JAPAN
²Waseda University, Kitakyushu-shi 808-0135, JAPAN
³Tokyo University of Agriculture and Technology, Koganei-shi 184-8588, JAPAN
- 4-5 Nanophase semi-conductive ceramics : Dielectric surface performance when exposed to charges**
 M. F. Fréchette,¹ R.Y. Larocque¹, Marco Blouin,² and Sabin Boily²
¹Institut de recherche d'Hydro-Québec
²Groupe Minutia, Inc., 75 de Mortagne blvd., Québec, CANADA
- 4-6 Effect of nano-fillers on electrical treeing in epoxy resin subjected to ac voltage**
 H. -Z. Ding and B. R. Varlow
 University of Manchester, School of Engineering, Oxford Road, Manchester, M13 9PL, UK
- 4-7 Manipulation and purification of multiwalled carbon nanotubes**
 X. Liu¹, J.L. Spencer¹, A.B. Kaiser¹ and W.M. Arnold²
¹Victoria University of Wellington, NEW ZEALAND
²Industrial Research Limited, Lower Hutt, NEW ZEALAND

1000-1030 Break (Refreshments)

1030-1230 Session 5 (Poster)

1030-1230 5A Biodielectrics

Chair: Kaori Fukunaga, Communications Research Laboratory, Tokyo, JAPAN
 Organizer: W. Mike Arnold, Industrial Research Ltd., NEW ZEALAND

- 5A-1 High thermal conductive epoxy resins with controlled high-order structure**
 K. Fukushima¹ H. Takahashi¹, Y. Takezawa¹, M. Hattori², M. Itoh², and M. Yonekura²
¹Materials Research Laboratory, Hitachi, Ltd., Hitachi, Ibaraki, JAPAN
²Hikone Factory, Shin-Kobe Electric Machinery Co., Ltd., Hikone, Shiga, JAPAN
- 5A-2 Modeling the dynamical response of biological cells**
 R. P. Joshi, Q. Hu, K. H. Schoenbach, and V. K. Lakdawala
 Dept. of Electrical & Computer Engineering, Old Dominion University, Norfolk, VA 23529, USA
- 5A-3 Electrical insulating properties of bamboo and effect of water absorption on them**
 Y. Shiji, Y. Muramoto and N. Shimizu
 Department of Electrical and Electronic Eng. Meijo University, JAPAN
- 5A-4 Control of cell elution from a dielectrophoresis micro-array using a permittivity gradient**
 R.S. Lee¹, W.M. Arnold² and R. Pethig¹
¹University of Wales, Bangor LL57 1UT, UNITED KINGDOM
²Industrial Research Limited, Lower Hutt, NEW ZEALAND
- 5A-5 Electrical anisotropy in wood**
 W.M. Arnold and M.K. Andrews
 Industrial Research Limited, Lower Hutt, NEW ZEALAND

1030-1230 5A High-Field Effects

- 5A-6 Feasibility study on FGM (Functionally graded materials) application for gas insulated equipment**
H. Shumiya, K. Kato, H. Okubo
Nagoya University, Nagoya, JAPAN
- 5A-7 High field Maxwell stress-strain characteristics of conventional polymers as actuators**
Toshikatsu Tanaka, Masayo Sato and Masahiro Kozako
Waseda University, Wakamatsu-ku, Kitakyushu-shi, 808-0135, JAPAN
- 5A-8 Dissipation current waveform observation of polyethylene film under AC high-field**
Suguru Masuda, Kazuyuki Toyama, Masayuki Nagao, Tetsuro Tokoro and Masamitsu Kosaki
¹Numazu College of Technology, JAPAN
²Toyohashi University of Technology, JAPAN
³Gifu National College of Technology, JAPAN
- 5A-9 The influence of particle shape on the ac electrical stress relieving behaviour of barium titanate polymer composites**
J. Robertson and B.R. Varlow
Manchester School of Engineering, University of Manchester, UK
- 5A-10 Seeds sorting by electrostatic separation: An experimental study**
M. Abdel Salam, A. Ahmed and H. El-Kishky
¹Department of Electrical Engineering, Faculty of Engineering, Assiut University, Assiut 71516, EGYPT
²Department of Electrical Engineering, The University of Texas at Tyler, Tyler, TX 75799, USA

1030-1230 5A Nanodielectrics

- 5A-11 Dielectric relaxation of a composite with tungsten nano-layered spherical filler particles**
N. Bowler¹, I. J. Youngs², K. P. Lymer³ and S. Hussain³
¹Center for Nondestructive Evaluation, Iowa State University, Ames, IA, USA
²Defence Science and Technology Laboratory, Salisbury, Wiltshire, UK
³QinetiQ Ltd, Cody Technology Park, Farnborough, Hampshire, UK
- 5A-12 Comparison between silicone rubber containing micro- and nano-size silica fillers**
A. H. El-Hag, S.H. Jayaram, E.A. Cherney
Electrical and Computer Engineering Department, University of Waterloo, Waterloo, Ontario, CANADA
- 5A-13 Effect of filler concentration on dielectric behaviour and on charge trapping in PP/clay nanocomposites**
M. Ambid¹, D. Mary¹, G. Teyssedre¹, C. Laurent¹, G. C. Montanari², D. Kaempfer³, R. Mülhaupt³
¹Paul Sabatier University, Laboratoire de Genie Electrique de Toulouse, FRANCE
²University of Bologna, Department of Electrical Engineering, ITALY
³Freiburger Materialforschungszentrum and Institut für Makromolekulare Chemie, GERMANY
- 5A-14 Meso and nano morphological changes of an epoxy surface exposed to low-intensity discharges in air**
M.F. Fréchette, R.Y. Larocque, R. Veillette, and M. L. Trudeau
Institut de Recherche d'Hydro-Québec, Varennes, Québec, CANADA

5A-15 Difference in surface degradation due to partial discharges between polyamide nanocomposite and microcomposite

Masahiro Kozako¹, Ryoichi Kido¹, Norikazu Fuse², Yoshimichi Ohki², Tatsuki Okamoto³, and Toshikatsu Tanaka¹

¹Waseda University, Kitakyushu-shi, JAPAN

²Waseda University, Shinjuku-ku, JAPAN

³Central Research Institute of Electric Power Industry, Yokosuka-shi, JAPAN

5A-16 Preparation and insulation properties of epoxy-layered silicate nanocomposite

Takahiro Imai¹, Fumio Sawa¹, Tetsuo Yoshimitsu¹, Tamon Ozaki² and Toshio Shimizu²

^{1,2}Power and Industrial Systems R&D Center, Toshiba Corporation,

¹Tsurumi-ku Yokohama and ²Fuchu-shi Tokyo, JAPAN

5A-17 Dielectric properties of epoxy nanocomposites containing TiO₂, Al₂O₃ and ZnO fillers

J. C. Fothergill¹, J. K. Nelson², M. Fu¹

¹University of Leicester, UK

²Rensselaer Polytechnic Institute, USA

1030-1230 5B Partial Discharge Measurements

Chair: Gian Carlo Montanari, University of Bologna, ITALY

Organizers: Shesha H. Jayaram, University of Waterloo, CANADA and
Christian Laurent, Paul Sabatier University, FRANCE

5B-1 Simulating propagation of UHF signals for PD monitoring in Transformers using the finite difference time domain technique

L. Yang, M. D. Judd and G. Costa

Institute for Energy and Environment, University of Strathclyde, Glasgow, Scotland, UK

5B-2 Time delay estimation for UHF signals in PD location of transformers

L. Yang, M. D. Judd and C.J. Bennoch

Institute for Energy and Environment, University of Strathclyde, Glasgow, Scotland, UK

5B-3 Improvement of PD location in GIS

Xin Li, Chengrong Li, Lijian Ding, Jing Yang, Hailiang Li

School of Electrical Engineering, North China Electric Power University, Beijing 102206 CHINA

5B-4 Improved identification level for defects generating partial discharges in solid insulation systems

A. Cavallini, F. Ciani, and G.C. Montanari

DIE-LIMAT, University of Bologna, ITALY

5B-5 On-line recognition and retrieval of PD signal by regularity measurement based on computation of Lipschitz exponents in wavelet domain

Pradeep Kumar and Shetty T. S. Ramu

Department of HVE Indian Institute of Science, Bangalore, INDIA

5B-6 Unconventional partial discharge measurement

M. Muhr, R. Schwarz, S. Pack, B. Koerbler

Technical University Graz, AUSTRIA

- 5B-7 A PPCA based non-parametric modeling and retrieval of PD signal buried in excessive noise**
Pradeep Kumar Shetty¹, R. Srikanth² T. S. Ramu
¹Department of HVE, IISc, Bangalore, INDIA
²Department of EE, IISc, Bangalore, INDIA
- 5B-8 Influence of cavity size and cavity location on partial discharge frequency dependence**
C. Forssén and H. Edin
Department of Electrical Engineering, Royal Institute of Technology, Stockholm, SWEDEN
- 5B-9 Partial discharge inception characteristics influenced by stressed wire length of inverter-fed motor**
Hitoshi Okubo¹, Yonghu Lu², Masato Morikawa² and Naoki Hayakawa²
¹EcoTopia Science Institute, Nagoya University, JAPAN
²Department of Electrical Engineering and Computer Science, Nagoya University, JAPAN
- 5B-10 The influence of winding type on the recognition of partial discharges**
S.Jayalalitha, A.Palani, V.Jayashankar
Indian Institute of Technology, Madras, Chennai, INDIA
- 5B-11 A new detection method of PD pulse signal based on multi sensor**
B. X. Du, Guozhong Wei, Mingjian Ouyang
College of Electrical Engineering and Automation, Tianjin University, CHINA
- 5B-12 Implementation of statistical capabilities into a digital acquisition and processing system for partial discharges**
G. Gerdin¹, K. Agarwal², P. Basappa² and V. Lakdawala¹
¹ Old Dominion University, Norfolk, VA, USA
² Norfolk State University, Norfolk, VA, USA
- 5B-13 Partial discharges measurements performed on the cryogenic joints**
F. Guastavino¹, P. Ferrari², M. Mariani³, L. Martini⁴, A. Matrone³, L. Ottonello², E. Torello¹
¹Electrical Engineering Department, University of Genova, Genova, ITALY
²Ansaldo Ricerche s.r.l., Genova, ITALY
³Ansaldo-CRIS, Napoli, ITALY
⁴CESI S.p.A, Milano, ITALY
- 5B-14 Partial discharge measurements at low pressures with and without a dielectric barrier**
D. L. Schweickart,¹ D. F. Grosjean,² D. G. Kasten,³ X. Liu³ and S. A. Sebo³
¹Air Force Research Laboratory, Wright-Patterson Air Force Base, Ohio, USA
²Innovative Scientific Solutions, Inc., Dayton, Ohio, USA
³Department of Electrical Engineering, The Ohio State University, Columbus, Ohio, USA
- 5B-15 Partial discharge detection and localisation in power transformers**
E. Gockenbach
Institute of Electric Power Systems, Division of High Voltage Engineering, Schering-Institute, University of Hannover, Hannover, GERMANY
- 5B-16 Partial discharge on-line measures in cable's EPR insulation**
R. Candela, E. Riva Sanseverino, P. Romano
Università degli Studi di Palermo, Dipartimento di Ingegneria Elettrica, Palermo - ITALIA

5B-17 A novel flexible approach for prediction and on line diagnostic of partial discharge
G. Ala, R. Candela, P. Romano, F. Viola
Università degli Studi di Palermo, Dipartimento di Ingegneria Elettrica, Palermo - ITALIA

5B-18 The feasibility of locating PD source in transformer using the UHF technology
Zhiguo Tang¹, Chengrong Li¹, Xingquan Huang², Zhili Li¹, Shangying Fu¹
1- Institute of High Voltage & EMC, North China Electric Power University, Beijing, CHINA; 102206
2- Henan Electric Power Testing Institute, Zhengzhou, CHINA; 450052

5B-19 A digital device for the diagnosis of insulation systems
I.M.A. Ramano, S. FerruggiaBonura, D. La Manna, A. Scavuzzo, G. Soto, R. Candela and P. Romano
¹CRES – Centro per la Ricerca Elettronica in Sicilia – Monreale (PA)
²Dipartimento di Ingegneria Elettrica – Università degli Studi di Palermo

1230-1400 Lunch Break

1230-1630 NIST and NCAR Technical Tour

1800-1900 Social Hour (Cash bar)

1900-2100 Banquet

————— **Wednesday, October 20** —————

0800-1000 Session 6 General II (Oral)

Chair: Lynn L. Hatfield, Texas Tech University, USA
Organizers: Vijendra Agarwal, The College of Staten Island of CUNY, USA

6-1 Investigation of human malignant cells by electrorotation
C. Dalton¹, S. Adamia², L. M. Pilarski² and K. V. I. S. Kaler¹
¹Department of Electrical and Computer Engineering, University of Calgary, AB, Canada
²Department of Oncology, University of Alberta and Cross Cancer Institute, Edmonton, AB, Canada

6-2 Thermal instability of electroactive polypropylene films
O. Fernández* and D.M Taylor
School of Informatics, University of Wales, Dean Street, Bangor Gwynedd LL57 1UT, UK

6-3 Dielectric characterization of single-crystal LiF, CaF₂, MgF₂, BaF₂, and SrF₂ at microwave frequencies
Richard G. Geyer¹, James Baker-Jarvis¹, and Jerzy Krupka²
¹National Institute of Standards and Technology, Boulder, CO USA
Instytut Mikroelektroniki i Optoelektroniki PW, Warszawa, Poland

6-4 In situ observation of optically and thermally induced charge depletion in chromophore-doped cyclic olefin copolymers
A. Mellinger¹, R. Singh¹, F. Camacho Gonzalez¹, Zbigniew Szamel², Ireneusz Głowacki²
¹University of Potsdam, Department of Physics, Am Neuen Palais
²Department of Molecular Physics, Technical University of Łódź

- 6-5 Breakdown probability of SF₆ due to voltage transients**
S. Meijer, P.H.F. Morshuis, J.J. Smit
Delft University of Technology, High voltage Technology and Management, Delft, Netherlands
- 6-6 Do ferroelectrets always behave like ferroelectrics?**
S.Bauer,S.Bauer-Gogonea, M. Dansachmüller, I. Graz, G. Leonhartsberger, R. Schwödiauer
Soft Matter Physics, Johannes-Kepler University
- 1000-1030 Break (Refreshments)**
- 1030-1230 Session 7 (Poster)**
- 1030-1230 7A Prebreakdown and Breakdown in Solids, Liquids, Gases, and Vacuum**

Chair: Glen Gerdin, Old Dominion University, USA
Organizers: Alberto Calva, Instituto Politecnico Nacional, MEXICO and
Huseyin R. Hiziroglu, Kettering University, USA
- 7A-1 Study of the behavior of metal particles in insulation oil under a non-uniform electric field**
N. Mashimo¹, Y. Aihara¹, A. Toya¹, Y. Murata², S. Katakai², and N. Numata²
¹Tokyo Electric Power Company, Chiyoda-ku, Tokyo, JAPAN
²J-Power Systems Corporation, Hitachi-shi, Ibaraki-ken, JAPAN
- 7A-2 Percolation model for electrical breakdown in insulating polymers**
K. Wu and L. A. Dissado
Department of Engineering, University of Leicester, Leicester LE1 7RH, UK
- 7A-3 Prebreakdown behaviour of oil-board-arrangements under lightning impulse stress**
W. Lick, M. Muhr
Institute of High Voltage Engineering and System Management
Graz, University of Technology
Inffeldgasse 18, A-8010 Graz
- 7A-4 The influence of surface roughness and coating on the impulse breakdown voltage in SF₆**
Ch. Lederle and J. Kindersberger
Institute of High Voltage Engineering and Electric Power Transmission, Technical University
Munich, GERMANY
- 7A-5 Polyurethane foam application for high voltage insulation**
G.G. Karady¹, M. Argin¹, F. Rahmatian², A. H. Rose³
¹Arizona State University, Tempe, AZ, USA
²Nxtphase Corporation, Vancouver, BC, Canada
³Nxtphase Corporation, Phoenix, AZ, USA
- 7A-6 Dielectric behaviour of compressed air in a slightly divergent field - Measurements versus simulations**
S. Stangherlin, G. Salge and F. Koenig
ABB Switzerland Ltd. – Corporate Research, 5405 Baden – Daettwil, Switzerland

- 7A-7 Gas bubble morphology in small working gaps at spark erosion**
H.-P. Schulze, G. Wollenberg, R. Herms, and K. Mecke
Otto-von-Guericke-University Magdeburg, Institute for Fundamental Electrical Engineering and EMC, Magdeburg, Germany
- 7A-8 Corona in atmospheric air between negative point and plane electrodes**
G.R.Gurumurthy¹, J.Amarnath², B.R.Natarajan³
¹Department of Electrical and Electronics Engineering, Ghousia College of Engineering, Ramanagaram-571511, Bangalore District, Karnataka State, India.
²Department of Electrical and Electronics Engineering, JNTU College of Engineering, Hyderabad-500072, Andhra Pradesh State, India.
³Department of Electrical and Electronics Engineering, Nitte Institute of Technology, Bangalore North-560064, Karnataka state, India
- 7A-9 Streamer injection and growth under impulse voltage: A comparison of cyclohexane, Midel 7131 and Nytro 10X**
Ø. L. Hestad, G. Berg, S. Ingebrigtsen and L. E. Lundgaard
SINTEF Energy research Trondheim, Norway
- 7A-10 Effect of antioxidants on the deterioration by partial discharge in LDPE and XLPE**
Yasuo Sekii, Masatoshi Ohno, Hidenori Oguma
Chiba Institute of Technology, Narashino, Chiba, Japan
- 7A-11 Response of N₂ + SF₆ to limiting orthogonal electric and magnetic fields**
M.S.Dincer¹ and H.R. Hiziroglu²
¹Department of Electrical & Electronics Engineering, Gazi University 06570 Maltepe, Ankara, Turkey
²Department of Electrical & Computer Engineering, Kettering University, Flint, Michigan 48504, USA
- 7A-12 Discharge inception on printed circuit board in an artificial fog**
B. X. Du, Yong Liu and Yu Gao
College of Electrical Engineering and Automation, Tianjin University, China
- 7A-13 Discharge characteristics on modified polycarbonate by adding flame retardant**
B. X. Du and Jun Xiao
College of Electrical Engineering and Automation, Tianjin University, China
- 7A-14 Influence of electrode area on dielectric breakdown strength of thin poly(ethylene terephthalate) films**
S. J. Laihonen¹, U. Gäfvert¹, T. Schütte², U. W. Gedde³
¹ABB Corporate Research, Västerås, Sweden
²Swedish Neutral, Kungsängen, Sweden
³Polymer and Fiber Technology, Royal Institute of Technology, Stockholm, Sweden
- 7A-15 Ozone generation in coaxial corona discharge using different material electrodes**
F. Pontiga¹, C. Soria², and A. Castellanos²
¹Dpto. De Física Aplicada II, Universidad de Sevilla, Spain
²Dpto. De Electronica y Electromagnetismo, Universidad de Sevilla, Spain
- 7A-16 Optical emission characteristics of a triple junction**
Michel F. Fréchette and René Y. Larocque
Institut de Recherche d'Hydro-Québec, Varennes, Québec, Canada

- 7A-17 Numerical modeling of S₂F₁₀ generation by negative corona discharge in SF₆**
 A. Fernandez-Rueda¹, F. Pontiga¹, C. Soria², and A. Castellanos²
¹Dpto. De Física Aplicada II, Universidad de Sevilla, Spain
²Dpto. De Electronica y Electromagnetismo, Universidad de Sevilla, Spain
- 7A-18 Effect of voltage rise rate on space charge distribution in HDPE film**
 Shiin'ichi Mitsumoto¹, Masumi Fukuma², Naohiro Hozumi³, and Masayuki Nagao³
¹Ube National College of Technology, UBE, Japan
²Matsue National College of Technology, Matsue, Japan
³Toyohashi University of Technology, Toyohashi, Japan
- 7A-19 Effect of preionization on forming atmosphere glow discharges in air**
 Zhan Huamao¹, Li Chengrong¹, Wang Xinxin², Li Ming¹
¹North China Electric Power University, Beijing, P. R. China
²Tsinghua University, Beijing, P. R. China
- 7A-20 Electrical characterization of multi-layered printed circuit boards**
 F. Guastavino, L. Centurioni, G. Coletti, A. Ratto, E. Torello
 Electrical Engineering Department, University of Genova via all'Opera Pia 11A, 16145 Genova, Italy
- 7A-21 Switching phenomena of new type PTC device as reusable current-limiting fuse operated by dielectrophoresis**
 S.Ohtsuka, Y.Souta, T.Abe, K.Kimura, and M.Hikita
 Department of Electrical Engineering, Kyushu Institute of Technology, Kitakyushu, Japan
- 7A-22 Underwater sound source based on pulsed corona discharge**
 P. Yan¹, Y. H. Sun¹, Y. X. Zhou², M. J. Jin^{1,3}
¹ Institute of Electrical Engineering, Chinese Academy of Sciences, Beijing 100080, P.R. China
² Department of Electrical Engineering, Tsinghua University, Beijing 100084, P.R. China
³ Graduate School of the Chinese Academy of Sciences, Beijing 100039, P.R. China
- 7A-23 Repetitively nanosecond-pulse breakdown of air at atmospheric pressure**
 Shao Tao^{1,2}, Sun Guang-sheng¹, Yan Ping¹, Yuan Wei-qun¹, Wang Jue¹, Gao Wei^{1,2}, Zhang Shi-chang¹
¹Institute of Electrical Engineering □ Chinese Academy of Sciences, Beijing, 100080, P.R. China
²Graduate School of Chinese Academy of Sciences, Beijing, 100039, P.R. China
- 7A-24 High voltage nanosecond breakdown in transformer oil**
 Wang Jue¹, Shao Tao^{1,2}, Yan Ping¹, Yuan Wei-Qun¹, Huang Wen-Li¹, Zhang Shi-Chang¹, Sun Guang-Sheng¹
¹ Institute of Electrical Engineering Chinese Academy of Science, Beijing, 100080, China
² Graduate School of Chinese Academy of Science □ Beijing, 100039, China

1030-1230 **7B Outdoor Insulation**

Chair: Reuben Hackam, University of Windsor, CANADA
 Organizers: Raji Sundararajan, Arizona State University East, USA

- 7B-1 Low molecular weight of fluid in an alloy of EPDM/SIR**
 K. Iida¹ and R. Hackam²
¹ Mie University, Tsu, Mie, 514-8507, Japan
² University of Windsor, Windsor, Ontario, N9B 3P4, Canada

- 7B-2 Electrical properties of snow**
M. Farzaneh, I. Fofana and H. Hemmatjou
NSERC / Hydro-Quebec / UQAC Industrial Chair on Atmospheric Icing of Power Network Equipment (CIGELE) and Canada Research Chair on Engineering of Power Network Atmospheric Icing (INGIVRE) at Université du Québec à Chicoutimi, Quebec, Canada, G7H 2B1
- 7B-3 Detection of dry-band arcing using time series modeling**
A. H. El-Hag
Electrical and Computer Engineering Department
University of Waterloo
Waterloo, Ontario, Canada
- 7B-4 Stress concentration testing of composite insulators with crimped end-fittings**
Jianjun Dai¹, Xidong Liang¹, Yuanxiang Zhou¹, Xuefeng Yao²
¹ Department of Electrical Engineering, Tsinghua University, Beijing, China
² Department of Mechanics Engineering, Tsinghua University, Beijing, China
- 7B-5 Improvement of electrical, mechanical and surface properties of silicone insulators**
M. Ehsani¹, H. Borsi², E. Gockenbach², G. R. Bakhshandeh¹, J. Morshedian¹
¹Iran Polymer and Petrochemical Institute, Tehran, Iran
²Institute of Electric Power Systems, Division of High Voltage Engineering (Schering-Institute) University of Hanover, Hanover, Germany
- 7B-6 Diagnosis of hydrophobic condition of polymer materials using dielectric measurement and image analysis**
T. Tokoro, T. Iwasaki and M. Kosaki
Gifu National College of Technology, Motosu, Gifu, Japan
- 7B-7 Estimation of surface degradation under immersion plasma by surface potential decay method**
D. H. Nguyen¹, A. Sylvestre¹, S. Béchu², S. Rowe³
¹Lab. for Electrostatics and Dielectric Materials (LEMD), BP 166, 38042 Grenoble, Cedex 9, France
²Lab. of Development by Magnetic Processes (EPM), BP 95, 38402 St Martin d'Hères Cedex, France
³SCHNEIDER ELECTRIC INDUSTRIES S.A, Drm, 38050 GRENOBLE, FRANCE
- 7B-8 Experimental study on the flashover performance of ice-covered insulators under impulse voltages**
J. Zhang, T. Guerrero and M. Farzaneh
NSERC/Hydro-Quebec/UQAC Industrial Chair on Atmospheric Icing of Power Network Equipment (CIGELE) and Canada Research Chair on Engineering of Power Network Atmospheric Icing (INGIVRE)
Université du Québec à Chicoutimi (UQAC), Chicoutimi, QC, Canada
- 7B-9 Calculation of lightning performance of a tower using induced charge quasi-static method**
Fuchang Lin, Haoju Liu, Huamao Zhan, Ling Dai
Huazhong University of Science & Technology, Wuhan, Hubei, China
- 7B-10 Study on the electrical strength of distribution insulators under steep front short duration pulse**
S. Grzybowski, Y. Song¹ and J. Kappenman²
¹Mississippi State University, Mississippi State, MS 39762
²Metatech Corporation, Goleta, CA 93117

- 7B-11 Performance of thermoplastic elastomeric insulators under IEC 5000h multistress conditions**
S. Venkatanarayanan, C. Olave, E. Jackson, G. Brignone, E. Romero, R. Sundararajan and B. Trepanier
Electronics & Computer Engineering Technology Department, Arizona State University East, Mesa, AZ-85212
B. Trepanier
GLP Hi-Tech Power Products Inc.. Quebec, Canada
- 7B-12 A realistic multistress screening/ranking test for high voltage outdoor polymeric insulators**
E. Soundarajan, E. Jackson, and R. Sundararajan
Electronics & Computer Engineering Technology Department
Arizona State University East, Mesa, AZ-85212
- 7B-13 Change of polymeric material exposed to dry band arc discharge**
Y. Zhu¹, M. Otsubo¹, N. Anami¹, C. Honda¹, O. Takenouchi², Y. Hashimoto³ and A. Ohono³
¹University of Miyazaki, 1-1, Gakuenkibanadai-Nishi, Miyazaki 889-2192, Japan
²Civil Aviation College, 652-2, Akae-Hieda, Miyazaki 880-8580, Japan
³Kyushu Electric Power Co. Inc., 2-1-47, Minamiku Siobara, Fukuoka 815-8520, Japan
- 7B-14 Techniques for estimation of biological contamination on insulators using image analysis**
A.D. Dernfalk and S.M. Gubanski
Department of Electric Power Engineering, Chalmers University of Technology, Sweden

1030-1230 7B Surface Flashover

- 7B-15 Impulse creepage discharges in rape-seed ester oil**
R. Hanaoka¹, Y. Iwasa¹, S. Takata¹, Y. Nakagami² and K. Takamoto³
¹Kanazawa Institute of Technology, 7-1 Ohgigaoka, Nonoichi, Ishikawa 921-8501, Japan
²Kogakuin University, 1-24-2 Nishi-Shinjuku, Shinjuku-ku, Tokyo 163-8677, Japan
³Kansai Tech Corporation. 3-1-176 Fukuzaki, Minato-ku, Osaka 552-0013, Japan
- 7B-16 A simplified model of corona discharge development on an ice surface**
I. Fofana and M. Farzaneh
NSERC / Hydro-Quebec / UQAC Industrial Chair on Atmospheric Icing of Power Network Equipment (CIGELE) and Canada Research Chair on Engineering of Power Network Atmospheric Icing (INGIVRE), Université du Québec à Chicoutimi, Quebec, Canada, G7H 2B1
- 7B-17 Determination of the arc re-ignition conditions on polluted insulating surfaces**
B. Zegnini¹, D. Mahi¹, and A. Chaker²
¹Materials Laboratory, Electrical Engineering Department, University of Ammar Telidji Laghouat, Algeria
²Net works Laboratory, Electrical Engineering Department, ENSET Oran, Algeria
- 7B-18 Discharge velocity effects across charged insulator surfaces**
E. Santos, R. A. Fouracre, and S. J. MacGregor
Institute for Energy and Environment, University of Strathclyde, 204 George Street, Glasgow G1 1XW, U.K.

1230-1400 Lunch Break

1400-1600 Session 8 General III (Oral)

Chair: Gerhard Sessler, University of Technology, Darmstadt, GERMANY
Organizers: Reimund Gerhard-Multhaupt, Chair, University of Potsdam, GERMANY

- 8-1 Influence of temperature on the hydrophobicity of silicone rubber surfaces**
Zhenyu LI¹, Xidong Liang¹, Yuanxiang Zhou¹, Jing Tang¹, Jifeng Cui², Yaxin Liu²
¹Department of Electrical Engineering, Tsinghua University, Beijing, China
²Shanxi Electrical Power Corporation, Taiyuan, Shanxi, China
- 8-2 Forces and movement of water droplets in oil caused by applied electric field**
A. Pedersen, E. Ildstad, A. Nysveen
Dept. of Electrical Power Engineering NTNU, Trondheim Norway
- 8-3 Physicochemical properties of silica filled silicone rubber nanocomposites**
A. H. El-Hag¹, L. C. Simon², S.H. Jayaram¹, E.A. Cherney¹
¹Department of Electrical and Computer Engineering; ²Department of Chemical Engineering
University of Waterloo, 200 University Avenue West, Waterloo, Ontario, Canada, N2L 3G1
- 8-4 A strip line ring resonator method for determination of dielectric properties of printed circuit board material in function of frequency**
J-M. Heinola, K-P. Lätti, J-P. Ström, M. Kettunen and P. Silventoinen
Lappeenranta University of Technology, Lappeenranta, FINLAND
- 8-5 Limitations on water cooling of rotors and stators in intermittent duty machines**
Clay S. Hearn, Jonathan J. Hahne, and Robert E. Hebner
The University of Texas at Austin, Austin, Texas, USA

1600-1615 Closing

	Sunday October 17	Monday October 18	Tuesday October 19	Wednesday October 20
0800		Welcome		
0900		The Whitehead Lecture	Session 4 Nanodielectrics (Oral)	Session 6 General II (Oral)
1000	High-Frequency Dielectric Measurements Workshop 0900-1300	Break	Break	Break
1100		Session 1 General I (Oral)	Session 5 (Poster) 5A Biodielectrics 5A High-Field Effects 5A Nano Dielectrics 5B Partial Discharge Measurements	Session 7 (Poster) 7 A Solids, Liquids, Gases, and Vacuum 7B Outdoor Insulation 7B Surface Flashover
1200	Celestial Seasonings Tea Tour and Leanin' Tree 1000-1500	Lunch	Lunch 1230-1400	Lunch
1300		Session 2 (Poster) 2A CS&T, 2B EHD 2B Flow Electrification 2B HF Dielectric Phenomena 2B Polarization Phenomena	NIST and NCAR Technical Tour 1230-1630	Session 8 General III (Oral)
1400				Closing
1500				
1600	Registration 1600-2100	Dinner		
1700				
1800	Reception (cash bar) 1800-2100	Session 3 (Poster) 3A Measurement Techniques 3B Aging 3B Treeing	Social Hour (Cash bar) 1800-1900	
1900			Banquet 1900-2100	
2000				
2100				

