

————— Sunday, October 16, 2011 —————

1600 – 2100 Registration

1800 – 2100 Reception (Cash bar)

————— Monday, October 17, 2011 —————

8:00 - 8:15 Welcome

8:15 - 9:30 Whitehead Lecture

Enhancement of Electrical Insulation Performance in Power Equipment Based on Dielectric Material Techniques

Hitoshi Okubo

Nagoya University, Furo-cho, Chikusa-ku, Nagoya, Japan

10:00 - 12:30 Session 1 (Oral) General I

Chair: Abder Beroual

Organizer: Isidor Sauers

1-1 Silicone Rubber and EPDM Micro Composites Filled with Silica and Ath

Isaias Ramirez¹, Shesha Jayaram², Edward Cherney²

¹Instituto de Investigaciones Electricas, Transision y Distribucion, Cuernavaca, Mexico,

²University of Waterloo, Electrical and Computer Department, Waterloo, ON, Canada

1-2 Diagnosis of Cable Aging by Broadband Impedance Spectroscopy

Yoshimichi Ohki¹, Takayuki Yamada¹, Naoshi Hirai²

¹Waseda University, Graduate School of Advanced Science and Engineering, Tokyo, Japan,

²Waseda University, Research Institute for Science and Engineering, Tokyo, Japan

1-3 New Approach of Sensor Positioning for Optimising Source Location of Partial Discharge

Prathamesh Dhole¹, Tanmoy Sinha², Sumeet Nayak³, Prasanta Kundu⁴, Kishore NK⁵

¹Schneider Electric, Electrical Engineering, Bangalore, India,

²N.T.P.C, Electrical Engineering, Kolkata, India,

³Areva T&D, Electrical Engineering, Kolkata, India,

⁴National Institute of Technology, Surat, Electrical Engineering, Surat,

India, ⁵Indian Institute of Technology Kharagpur, Electrical Engineering, Kharagpur, India

1-4 Pulsed X-Ray Induced Partial Discharge Measurements (Pxipd): Phase Resolved Pd Patterns and Time-Resolved Discharge Measurements

Sedat Adili¹, Christian M. Franck¹, Suna Bolat Sert¹, Lorenz G. Herrmann²

¹ETH Zürich, Institute for Power Systems and High Voltage Technology, Zürich,

Switzerland,

²Corporate Research, ABB Switzerland Ltd, Baden-Daettwil, Switzerland

1-5 On the Temperature Dependence Of Electrical And Mechanical Properties of Recyclable Cable Insulation Materials Based Upon Polyethylene Blends

Christopher Green¹, Alun Vaughan¹, Gary Stevens², Simon Sutton³, Theo Geussens³, Mike Fairhurst⁴

¹University of Southampton, ECS, Southampton, United Kingdom,

²GnoSys UK Guildford, United Kingdom,

³Dow Wire and Cable Staines, United Kingdom,

⁴National Grid Warwick, United Kingdom

1-6 The Influence Of Magnetite Nanoparticles On The Dielectric Properties Of Solid Insulators

Martin Given, Tony Fouracre, Igor Timoshkin, Mark Wilson, Scott MacGregor

University of Strathclyde, Electronic and Electrical Engineering, Glasgow, United Kingdom

1-7 Time Domain Dielectric Spectroscopy of Biological Cells after Pulsed Electric Field Exposure

Jie Zhuang, Karl H. Schoenbach, Juergen F. Kolb

Old Dominion University, Frank Reidy Research Center for Bioelectrics, Norfolk, VA, USA

14:00 - 16:00 Session 2A (Poster) Aging

Chair: Govinda Raju

Organizer: Kazuyuki Tohyama

- 2A-1 The Influence of Square Voltage Waveforms on Transformer Insulation Break Down Voltage**
Andrea Cavallini¹, Tomasz Koltunowicz², Dhiradj Djairam², Gian Carlo Montanari¹, Johan Smit²
¹University of Bologna, Department of Electrical Engineering, Bologna, Italy, ²Delft University of Technology, Department Electrical Sustainable Energy, Delft, Netherlands
- 2A-2 Thermal and Thermo-Oxidative Aging Effects on the Dielectric Properties of Thin Polyimide Films Coated on Metal Substrate**
Rabih Khazaka, Sombel Diahm, Marie-Laure Locatelli, Cédric Trupin, Benoît Schlegel
Université de Toulouse, UPS, INPT, Laplace, CNRS, Toulouse, France
- 2A-3 Space Charge Characteristics of HTV Silicone Rubber after Corona Aging**
Meixin Luo, Youping Tu, Cong Wang, Gaofeng Ying
North China Electric Power University, Beijing Key Laboratory of High Voltage & EMC, Beijing, China
- 2A-4 May the Capacity of Power Cables Be an Aging Indicator?**
Serghei Savin^{1,2}, Sonia Ait-Amar^{1,2}, Daniel Roger^{1,2}, Gabriel Velu^{1,2}
¹Université Lille, Lille, France,
²UArtois, LSEE, Béthune, France
- 2A-5 Aging Effects on the Ac Motor Windings: a Correlation Between The Variation of Turn-To-Turn Capacitance and the PDIV**
Serghei Savin^{1,2}, Sonia Ait-Amar^{1,2}, Daniel Roger^{1,2}, Gabriel Velu^{1,2}
¹Université Lille, Lille, France,
²UArtois, LSEE, Béthune, France
- 2A-6 Partial Discharge Degradation of Mica**
Jason Paterson, Andrew Shields, Donald Hepburn
Glasgow Caledonian University, Glasgow, United Kingdom
- 2A-7 Feasibility Study on the Detection of Corrosion in Cable Shield Metal Using Terahertz Imaging**
Ryo Sato¹, Marina Komatsu¹, Maya Mizuno², Kaori Fukunaga², Yoshimichi Ohki¹
¹Waseda University, Graduate School of Science and Engineering, Tokyo, Japan,
²National Institute of Information and Communications Technology, Applied Electromagnetic Research Center, Tokyo, Japan

2A-8 Wavelet as a Diagnostic Tool for Fault Classification and Identification in Underground Power Cable

Abhishek Pandey, Nicolas Younan

Mississippi State University, Electrical and Computer Eng, Mississippi State, USA

2A-9 Life Models of Polyimide Film under Combined Thermal and Electrical Stresses Used In Inverter-Fed Traction Motor

Yi Cui, Guangning Wu, Kaijiang Cao, Yang Luo

Southwest Jiaotong University, School of Electrical Engineering, Chengdu, China

2A-10 High Temperature Aging of Enameled Copper Wire - Relationships between Chemical Structure and Electrical Behavior

Benoit Petitgas^{1,2}, Gérard Seytre¹, Olivier Gain¹, Gisèle Boiteux¹, Isabelle Royaud¹, Anne Gimenez², Alain Anton³

¹Universite Lyon1, Ingenierie des Materiaux Polymeres, Villeurbanne, France,

²Societe Leroy Somer, Leroy Somer, Angouleme, France,

³Conseiller Scientifique Chaponnay, France

2A-11 Bonds Breaking and Molecular Chains Straining in the Electrical Aging of Polyethylene

Jean-Pierre Crine

Retired St-Bruno, QC, Canada

2A-12 Time Evolution of the Activation Energy and Volumes in Electrical Aging and Wave Packets in Polyethylene

Jean-Pierre Crine

Retired St-Bruno, QC, Canada

2A-13 Dielectric Response Function for Nonhomogeneous Insulations

Cristina Stancu¹, Petru V. Nothingher², Laurentiu Badicu²

¹INCDIE ICPE CA, Advanced Materials, Bucharest, Rumania,

²University Politehnica of Bucharest, Electrotechnical Materials, Bucharest, Rumania

14:00 - 16:00 Session 2B (Poster) Charge Storage

Chair: Virginie Griseri

Organizer: Wang Liming

- 2B-1 Space Charge Dynamic at the Physical Interface in Cross-Linked Polyethylene under DC Field and Different Temperatures**
Rogti Fatiha
Université Amar Tlidji, Laghouat Algeria, Génie Electrique, Laghouat, AK, Algeria
- 2B-2 Space Charge Behaviour in Polyethylene under AC Electric Fields**
Junwei Zhao, Zhiqiang Xu, George Chen, Paul L Lewin
University of Southampton, School of Electronics and Computer Science, Southampton, United Kingdom
- 2B-3 Electrochemical Capacitances of Carbon Powder Treated with Dielectric Barrier Discharge**
Daisuke Tashima, Ryotaro Hirakawa, Tatsuya Sakoda, Masahisa Otsubo
University of Miyazaki, Department of Electrical and Electronic Engineering, Miyazaki, Japan
- 2B-4 Electrical Properties of Nano Carbon Produced From Organic Waste**
Daisuke Sumida, Tomohide Kishita, Yuichi Tanaka, Daisuke Tashima, Masahisa Otsubo
University of Miyazaki, Department of Electrical and Electronic Engineering, Miyazaki, Japan
- 2B-5 Electronic Conduction Properties of TiO₂ Thin Films under UV Light Irradiation**
Yusuke Watanabe, Yuji Muramoto, Noriyuki Shimizu
Meijo University, Electrical and Electronic Engineering, Nagoya, Japan
- 2B-6 Space Charge Distributions in Polyimide Thin Films Determined by FLIMM**
Cong-Duc Pham¹, Marie-Laure Locatelli², Laurent Berquez¹, Sombel Diahm¹, Gilbert Teyssedre^{1,2}
¹Université de Toulouse, UPS, INPT, Laplace, 118 route de Narbonne, France,
²CNRS, LAPLACE, Toulouse, France
- 2B-7 Internal Charging Phenomena and Change of Electrical Properties in Electron Beam Irradiated Insulating Materials for Spacecraft**
Kenta Yagai, Hiroaki Miyake, Yasuhiro Tanaka, Tatsuo Takada
Tokyo City University, Engineering department, Tokyo, Japan

- 2B-8 Charge Accumulation Phenomena in PI Film Irradiated by a Proton**
Hiroaki Miyake, Seiya Numata, Ryou Uchiyama, Yasuhiro Tanaka, Tatsuo Takada Tokyo City University, Mechanical system engineering, Tokyo, Japan
- 2B-9 Polymer Ferroelectrets with Stacked Tubular Channels**
Ruy Alberto Pisani Altafim¹, Ruy Alberto Correa Altafim¹, Xunlin Qiu², Heitor Cury Basso¹, Werner Wirges², Reimund Gerhard²
¹University of Sao Paulo, Department of Electrical Engineering, Sao Carlos, Brazil,
²University of Potsdam, Applied Condensed-Matter Physics, Institute of Physics and Astronomy, Potsdam, Germany
- 2B-10 Multilayers Fluoroethylenpropylene (FEP) Films Bounded with Adhesive Tape to Create Piezoelectrets with Controlled Cavities**
Daniel Rodrigo Falconi, Ruy Alberto Correa Altafim, Ruy Alberto Pisani Altafim, Heitor Cury Basso
University of Sao Paulo, Department of Electrical Engineering, Sao Carlos, Brazil
- 2B-11 Observation of Space Charge Dynamics in Air**
Markus Saltzer¹, Uno Gäfvert², Birgitta Källstrand², Kenneth Johansson², Lars Walfridsson²
¹ABB Corporate Research Baden-Dättwil, Switzerland,
²ABB Corporate Research Västerås, Sweden
- 2B-12 Effect of Cumylalcohol in XLPE on Space Charge Formation and Electric Breakdown under DC High Electric Field**
Hayashi Nobuya¹, Tanaka Yasuhiro¹, Maeno Takashi²
¹Tokyo City University, Engineering department, Tokyo, Japan,
²National Institute of Information and Communications Technology Tokyo, Japan
- 2B-13 Electrical Properties of Conventional and Spark Plasma**
Thomas Pérel¹, Vincent Bley¹, David Malec¹, Fabien Bourel², Sophie Guillemet-Fritsch², Claude Estournès², Frédéric Malpièce³, Jonathan Morel³
¹Université Paul Sabatier, Laplace, Toulouse, France,
²Université Paul Sabatier, CIRIMAT, Toulouse, France,
³Tridelta Parafoudres, Toulouse, France

2B-14 Effect of Gamma-Ray Irradiation on Lateral Charge Motion on Surface of Laminated Polymer Insulating Materials

Yu Gao, Boxue Du

Tianjin University, School of Electrical Engineering and Automation,
Tianjin, China

2B-15 Phase Characteristics of Space Charge Signal under AC Nonuniform Electric Field in PEA Method

Fukuma Masumi¹, Takao Toru¹, Fujii Masayuki²

¹ Matsue College of Technology, Department of Electrical Engineering,
Matsue, Japan,

²Oshima College of Maritime Technology, Electronic Mechanical
Engineering, Oshima, Japan

2B-16 Researched on Microstructure and Density of Sintered ZnO Non-Linear Resistors

Chuntian Chen, Haifeng Xiao, Junyi Zou, Ru Wang, Hanfei Zhu, Xianyou
Zhang

Harbin University of Science and Technology, Harbin, China

14:00 - 16:00 Session 2C (Poster) Biodielectric, High Field Effects and High Frequency Dielectric Phenomena

Chair: Rajeswari Sundararajan

Organizer: N.K. Kishore

2C-1 Effect of Irreversible Electroporation on Cancer Cells

Rajeswari Sundararajan¹, Ramya Rajendran², Sajan Shahid², Santosh
Kanagaraj², Snehalatha Radhakrishnan², Priyadarshan Kathirvel³, Varsha
Sundaresan³, Vimal Kumar Udayakumar³, Rajaprabu Ramachandran²,
Kavitha Sankaranarayanan³

¹Purdue University, Electrical and Computer Engineering Technology,
West Lafayette, IN, USA,

²B S Abdur Rahman University, Electrical and Electronics, Chennai, India,

³MIT Campus of Anna University, AU-KBC Research Centre, Chennai,
India

2C-2 Influence of Strength of DC Electric Field on Plant Growth

Takamasa Okumura, Shuya Iwata, Yuji Muramoto, Noriyuki Shimizu
Meijo University, Electrical & Electronic Eng., Nagoya, Japan

2C-3 Researched on Microstructure and Density of Sintered ZnO Non-Linear Resistors

CT Chen, HF Xiao, JY Zhou, R Wang, HF Zhu
Harbin University of Science and Technology, Harbin, China

2C-4 Effect of D.C. Voltage Application on Ethanol Fermentation

Yuta Watanabe, Yuji Muramoto, Noriyuki Shimizu
Meijo University, Electrical and Electronic Engineering, Nagoya, Japan

2C-5 Influence of AC Electric Field on Plant Growth

Shuya Iwata, Takamasa Okumura, Yuji Muramoto, Noriyuki Shimizu
Meijo University, Electrical and Electronic Eng, Nagoya, Japan

2C-6 Electrical Breakdown Characteristics of Palm Kernel Oil Ester-Based Dielectric Fluids

Abdelghaffar Abdelmalik, John Fothergill, Steven Dodd
University of Leicester, Engineering Department, Leicester, United Kingdom

2C-7 A Simulation Analysis of the Multi Electrode Needles on Electroporation Efficiency of a Cancer Tissue

Siddharth Bommakanti¹, Luca Campana², Raji Sundararajan¹
¹Purdue University, ECET, West Lafayette, IN, USA,
²University of Padova, Melanoma Institute, Padova, Italy

2C-8 Finite Element Modeling and Analysis of Human Breast Tissue for Electrochemotherapy

Poornima Agoramurthy¹, Luca Campana², Raji Sundararajan¹
¹Purdue University, ECET, West Lafayette, IN, USA,
²University of Padova, Melanoma Institute, Padova, Italy

2C-9 Terahertz Spectroscopy of Poly(3-Hydroxyalkanote)S

Hiromichi Hoshina¹, Yusuke Morisawa², Harumi Sato², Isao Noda³,
Yukihiro Ozaki², Chiko Otani¹
¹RIKEN, ASI, Sendai, Japan, ²Kwansei Gakuin University Sanda, Japan,
³The Procter & Gamble Company, West Chester, OH, USA

2C-10 Computation of the Dielectric Stress Produced By PWM Type Waveforms on Medium Voltage Transformer Windings

Pablo Gomez¹, Fermin Espino-Cortes¹, Francisco de Leon²
¹Instituto Politecnico Nacional, Electrical Engineering, Mexico, Mexico,
²Polytechnic Institute of New York University, Electrical & Computer Engineering, New York, NY, USA

2C-11 Influence of Oil Temperature on Frequency Characteristics of Disk and Layer Transformer Windings

Marek Florkowski¹, Barbara Florkowska², Jakub Furgał², Piotr Pająk²

¹ABB Corporate Research, PLCRC, Kraków, Poland,

²AGH University of Science and Technology, Department of Electrical Engineering and Electrical Power, Kraków, Poland

2C-12 The Influence of Different Conductors on Insulating Materials Degradation by Partial Discharges at PWM supply

Marek Florkowski¹, Barbara Florkowska², Andrzej Rybak², Paweł Zydrón¹

¹ABB Corporate Research, PLCRC, Kraków, Poland,

²AGH University of Science and Technology, Department of Electrical Engineering and Electrical Power, Kraków, Poland

2C-13 Effect of Epoxy Coating on Particle Movement in SF₆/N₂ Gas Insulated Busduct

Raghavendra Rao Maarisetty¹, Amarnath Jinka²

¹V.R.Siddhartha Engineering College, Electrical and Electronics

Engineering, Vijayawada, India,

²J.N.T.U.H College of Engineering, Electrical and Electronics engineering, Hyderabad, India

2C-14 Electric Field Analysis at the Triple Junction of a Disc Type Spacer in SF₆ Gas Insulated System with Abnormalities under DC Voltages

Duvvada Deepak Chowdary¹, Jinka Amarnath²

¹Vignans Institute of Engineering for Women, Electrical and Electronics Engineering, Visakhapatnam, India,

²Jawaharlal Nehru Technological University, Electrical and Electronics Engineering, Hyderabad, India

2C-15 Three-Dimensional Electric Field Calculation and Measurements inside High Voltage Substations

Essam Shaalan, Samy Ghania, Sayed Ward

Faculty of Engineering at Shoubra, Electrical Power Engineering, Egypt,

2C-16 Experimental Studies of Current Distribution in Stratified Seawater under Spark Discharges

Nur Shahida Midi, Ryu-ichiro Ohyama

Tokai University, Electrical and Electronic Engineering, Kanagawa, Japan

**2C-17 Ionic Wind Characteristics of an EHD Micro Gas Pump
Constructed with Needle-Ring Electrode System**

Satoshi Ohyama, Ryu-ichiro Ohyama

TOKAI University, Electrical and Electronic Engineering, KANAGAWA,
Japan

**2C-18 Influence of Electrostatic Induction Electrode Configuration on Water
Mist Charging**

Hazmi Hijazi Abdul Halim, Ryu-ichiro Ohyama

Tokai University, Electrical and Electronic Engineering, Kanagawa, Japan

**2C-19 Analysis of Electromagnetic Field in Vacuum Interrupter with
Longitudinal Magnetic Field Contacts**

Rong Xu¹, Ying Zhao², Jue Wang¹, Ping Yan¹

¹Chinese Academy of Sciences, Institute of Electrical Engineering, Beijing,
China,

²Chinese Academy of Sciences, Key Laboratory of Power Electronics and
Electric Drives, Beijing, China

19:00 - 21:00 Session 3A (Poster) Measurement Techniques

Chair: Andrea Cavallini

Organizer: Simon Rowland

**3A-1 Non Destructive Observation of Defects in Composite
Materials Using Time Domain THz Imaging**

Kaori Fukunaga¹, Maya Mizuno¹, Fabien Destic², Sébastien Massenot²,
Jean-Claude Mollier³

¹National Institute of Information and Communications Technology,
Applied

Electromagnetic Research Center, Tokyo, Japan,

²Institut Supérieur de l'Aéronautique et de l'Espace, Electronique
Optronique Signal, Toulouse, France,

³Office National d'Études et de Recherches Aérospatiales Toulouse, France

**3A-2 Three-Dimensional Analysis of Polarization Profiles in Electret
Materials**

Saurav Aryal, Axel Mellinger

Central Michigan University, Department of Physics, Mount Pleasant, MI,
USA

- 3A-3 A New Calibration Concept of the Pulsed Electro Acoustic Method Allowing to Improve Charge Density Measurement**
Mohamad Abed al Rahm Arnaout¹, Laurent Berquez¹, Fulbert Baudoin¹, Denis Payan²
¹Toulouse University, Plasma and energy conversion laboratory, Toulouse, France,
²National Center of Space Studies, Toulouse, France
- 3A-4 Accurate Temperature Correction of Dissipation Factor Data for Oil-Immersed Bushings - Field Experience**
Diego Robalino
MEGGER - AVOMultiamp, Technical Support Group, Dallas, TX, USA
- 3A-5 The Comparative Study of Overall and Partial Surface Conductivity Method**
Baoqiang Sun, Liming Wang, Zhecheng Guan
Graduate School at Shenzhen, Tsinghua University, Electrical Engineering, Shenzhen, China
- 3A-6 Study of Possibility of Electrical Control on Drug Movement in Tape for Percutaneous Absorption**
Yuuya Shimizu, Yoshinobu Murakami, Muneaki Kurimoto, Masayuki Nagao
Toyohashi University of Technology, Electrical and Electronic Information Engineering, Tenpaku, Japan
- 3A-7 Study on the Detrapping of Charge Carriers in Polyethylene Films**
Lijuan He¹, Dayong Li¹, Dongni Wang¹, Jinglei Cao¹, Xuan Wang², Qingquan Lei²
¹Harbin University of Science and Technology, School of applied science, Harbin, China,
²Harbin University of Science and Technology, Key Laboratory of Engineering Dielectric and its Application, Ministry of Education Harbin, China
- 3A-8 A High Voltage Penetrator for High Pressure and Temperature Laboratory Testing**
Gunnar Berg, Jørund Aakervik, Oddgeir Kvien, Sverre Hvidsten
SINTEF Energy Research, Electric Power Technology, Trondheim, Norway

3A-9 Transformation of Nitrogen SPS Spectra Emitted from Streamer Discharge Head within a Sub-Nanosecond - Nanosecond Range

Yuri Shcherbakov, Leonid Nekhamkin

All-Russian Electrotechnical Institute, High-Voltage Research Center,
Istra-2, Russia

3A-10 PD Behaviour of Basic Test Arrangements under Different Measurement and Evaluation Conditions

R. Haller¹, J. Pihera¹, P. Mraz¹, S. Kornhuber², M. Boltze²

¹University of West Bohemia in Pilsen, Faculty of Electrical Engineering,
Univerzitní 8, 306 14, Pilsen, Czech Republic

²Doble-Lemke GmbH, Zschoner Ring 9, 01723 Kessesldorf, Germany

3A-11 Material Property Measurement of Granular Materials Using a Calibrated Dielectric Spectroscopy System

Hsiu-Che Wang¹, Valery Inclan², Alexei Zyuzin², Nicholas Donnangelo³,
Alexander Mamishev⁴

¹Dept. of Mechanical Engineering, University of Washington, Seattle, WA,
USA

²Illionix, LLC, Seattle, WA, USA

³MITRE Corp, McLean, VA, USA

⁴Dept. of Electrical Engineering, University of Washington, Seattle, WA,
USA

3A-12 Distribution Class Transformer Insulation Evaluation under Distorted Voltage Waveforms

Omar M. Hamid and Shesha H. Jayaram

Electrical and Computer Engineering, University of Waterloo, Canada

3A-13 Analysis of Cable Termination under Power Frequency and High Frequency Voltages

Utkarsh Patel¹, Shesha H. Jayaram¹, and Ayman El-Hag²

¹Electrical and Computer Engineering, University of Waterloo, Waterloo,
Canada

²Department of Electrical Engineering, American University of Sharjah,
Sharjah, UAE

3A-14 A Sensing Method Based on Reflective Property of the Thin Metallic Mesh Device in the Terahertz Region

Sakura Tomita¹, Yuichi Ogawa¹, Tetsuhito Suzuki¹, Takashi Kondo², Seiji
Kanba², Naoshi Kondo¹

¹Kyoto university, Graduate School of Agriculture, Kyoto, Japan,

²Murata Manufacturing Company Ltd., Kyoto, Japan

3A-15 A New Method for Improving the Reliability of Dissolved Gas Analysis

Balint nemeth, Casba Voros, Richard Cselko, Gabor Gocsei
Budapest University of Technology and Economics, Hungary

19:00 - 21:00 Session 3B (Poster) Nanodielectrics

Chair: Clive Reed

Organizer: Gilbert Teyssedre

3B-1 Stoichiometry and Effects of Nano-Sized and Micro-Sized Fillers on an Epoxy Based System

Van Nguyen¹, A. S. Vaughan¹, P.L. Lewin¹, A. Krivda²

¹University of Southampton, School Of Electronics & Computer Science, Southampton, United Kingdom,

²ABB Switzerland Ltd, Corporate Research, Baden-Daettwil, Switzerland

3B-2 The Complex Permittivity of Epoxy Based Nanocomposites with Alumina and Magnesium Oxide Fillers at Very Low Temperatures

Thomas Andritsch, Roman Kochetov, Peter Morshuis, Johan Smit
Delft University of Technology, High Voltage Technology & Management, Delft, Netherlands

3B-3 Impact of Partial Discharges on Epoxy Nanodielectrics

Ganpathy Iyer¹, Ravi Gorur¹, Andrej Krivda²

¹Arizona State University, Electrical Engineering, Tempe, AZ, USA,

²ABB Corporate Research Baden-Daettwil, Switzerland

3B-4 Comparison among the PD Resistance Behavior of Different Enameled Wires When Subjected To Pwm Voltage

Francesco Guastavino¹, Giovanna Biondi², Andrea Ceci², Giovanni Loggi², Andrea Dardano³, Alessandro Ratto¹, Eugenia Torello¹

¹University of Genova, Naval and Electrical Engineering, Genova, Italy,

²Elantas Deatech S.r.l. Ascoli Piceno, Italy,

³Diasol S.r.l. Genova, Italy

3B-5 Comparison of the Effects of Nanofiller Materials on the Dielectric Properties of Epoxy Nanocomposites

Jun Katayama¹, Toshikatsu Tanaka², Yoshimichi Ohki¹, Norikazu Fuse³, Masahiro Kozako⁴

¹Waseda University, Graduate School of Science and Engineering, Tokyo, Japan,

²Waseda University, Information, Production and Systems Research Center, Fukuoka, Japan,

³Central Research Institute of Electric Power Industry Kanagawa, Japan,

⁴Kyushu Institute of Technology, Department of Electrical Engineering and Electronics Faculty of Engineering, Fukuoka, Japan

3B-6 Effect of Nanoparticle Size on Space Charge Behavior of EVA-TiO₂ Nanocomposites

Davide Fabiani, Gian Carlo Montanari, Fabrizio Palmieri
University of Bologna, Dept. of Electrical Eng., Bologna, Italy

3B-7 High Thermal Conductive Composite Sheets with Controlled Nanostructures for Electric Devices

Yoshitaka Takezawa, Tomoo Nishiyama, Hideyuki Katagi, Shi-hui Song
Hitachi Chemical Co., Ltd., Tsukuba Research Laboratory, 48 Wadai,
Tsukuba-shi, Ibaraki, Japan

3B-8 Evaluation of Thermal Conductive Resistance at Organic-Inorganic Interface and Development of Thermal Conductive Insulation Materials for Electronic Devices

Keiji Fukushima¹, Yoshitaka Takezawa², Tadafumi Adschiri³

¹Japan Chemical Innovation Institute, R&D Laboratory at Tohoku University, Sendai, Japan,

²Hitachi Chemical Co., Ltd., Tsukuba Research Laboratory, Tsukuba, Japan,

³Tohoku University, WPI-Advanced Institute of Materials Research, Sendai, Japan

3B-9 DC Breakdown Characteristic on LDPE/MgO Nanocomposite Influenced by DC Prestress

Yoshinobu Murakami¹, Soichi Imazawa¹, Muneaki Kurimoto¹, Masayuki Nagao¹, Yoitsu Sekiguchi², C. C. Reddy², Yoshinao Murata²

¹Toyohashi University of Technology, Electric, Electronic and Information, Toyohashi, Japan,

²J-Power Systems, Research and Development Center, Hitachi, Japan

3B-10 Proposal of the Three-Phase Lewis-Nielsen Model for Fitting the Thermal Conductivity of the Polymer Nanocomposites

Roman Kochetov¹, Alexandr Korobko², Thomas Andritsch¹, Peter H.F. Morshuis¹, Stephen J. Picken², Johan J. Smit¹

¹TU Delft, High Voltage Components and Power Systems, Delft, Netherlands,

²TU Delft, NanoStructured Materials, Delft, Netherlands

3B-11 Impact of Postcuring and Water Absorption on the Dielectric Response of the Epoxy-Based Composites Filled with MgO Nanoparticles

Roman Kochetov, Thomas Andritsch, Peter H.F. Morshuis, Johan J. Smit
TU Delft, High Voltage Components and Power Systems, Delft, Netherlands

3B-12 Dielectric Properties of Epoxy / Montmorillonite Nanocomposites and Nanostructured Epoxy / SiO₂ / Montmorillonite Microcomposites

Hugues Couderc¹, Sylvio Savoie¹, Michel Fréchet¹, Eric David²,
Francesco Guastavino³, Abdul Salam Thelakkadan³, Gianfranco Coletti³,
Alberto Fina⁴

¹Institut de Recherche d'Hydro Québec, Chemistry and Materials, Varennes, QC, Canada,

²Ecole de Technologie Supérieure, Génie mécanique, Montréal, QC, Canada,

³University of Genova, Materials Science and Chemical Engineering, Genova, Italy,

⁴Politecnico di Torino, Materials Science and Chemical Engineering, Turin, Italy

19:00 - 21:00 Session 3C (Poster) Outdoor Insulation

Chair: Shesha Jayaram

Organizer: Rodolfo Garcia-Colon

3C-1 Experienced Gained from 132 kV EPDM Composite Insulators in a Coastal Environment

Antonios Tzimas, Simon M. Rowland

University of Manchester, School of Electrical and Electronic Engineering, Manchester, United Kingdom

3C-2 Surface Degradation of XLPE Insulation at Oil-Water Interfaces

Frank Mauseth¹, Sverre Hvidsten², Geir Birkenes³

¹Norwegian University of Science and Technology, Department of Electric Power

Engineering, Trondheim, Norway,

²SINTEF Energy Research Trondheim, Norway,

³Goodtech Projects & Services AS Bergen, Norway

3C-3 Influence of Humidity on Streamer Propagation along Silion Rubber Insulation Surface

Xiaobo Meng¹, Lin Zhang¹, Xingming Bian¹, Liming Wang¹, Zhicheng Guan¹, Yingjian Yang²

¹Graduate school at Shenzhen, Tsinghua University, Shenzhen, China,

²State grid electric power research institute, Wuhan, China

3C-4 The Arc Discharge on Contaminated and Iced Surface

Su Huafeng, Jia Zhidong, Guan Zhicheng, Li Licheng

Tsinghua University, Electrical Engineering, Beijing China

3C-5 Dynamic load on Composite Insulators used in UHVDC Lines Due to Conductor Galloping

Guanjun Fu, Liming Wang, Zhicheng Guan, Chuang Wang

Tsinghua University, Graduate School at Shenzhen, Shenzhen, China

3C-6 Combined Effect of Different Fields on the Motion Characteristics of Dust Particles around the Insulators

Jing Wang, Xi-dong Liang, Lin-hua Chen, Yu Liu

Tsinghua University, Dept. of Electrical Engineering, Beijing, China

3C-7 Characterization of Field-Aged 500 kV Composite Insulators

Zhou You, Wang Fochi, Li Chengrong, Jiang Huai

North China Electric Power University, Beijing Key Laboratory of High Voltage & EMC, Beijing, China

3C-8 Accelerated Testing of Outdoor Power Equipment

Andrej Krivda¹, Bandeep Singh², Martin Carlen³, Thomas Hartmann²,
Stephane Schaal³, Pentti Mahonen⁴, Hoan D. Le⁵

¹ABB Ltd, Corporate Research, Baden-Daettwil, Switzerland,

²ABB Ltd Bland,

³ABB Ltd Baden-Daettwil, Switzerland,

⁴ABB Ltd Vaasa, Finland,

⁵ABB Ltd Pinetops, NC, USA

3C-9 Prevention Measures for Flashover Performance of Insulators under Icing Conditions on 330 kV Overhead Transmission Lines

Lu Pu^{1,2}, Xiaolong Cao¹, Yang Xu¹, Sisi Hui¹, Xiuyu Xie²

¹Xi'an Jiaotong University, State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an, China,

²Shaanxi Electric Power Research Institute Xi'an, China

3C-10 Analysis of the Performance of Nonceramic Insulators on 230 kV and 400 kV Transmission Lines

Ramiro Hernandez-Corona, Isaias Ramirez-Vazquez, Gerardo Montoya-Tena

Instituto De Investigaciones Electricas, Transmision Y Distribucion, Cuernavaca, Mexico

3C-11 Study of the Performance of 25 kV Insulators under Various Weather Conditions

Luiz Meyer¹, Graziano Cardoso¹, Fernando Molina²

¹FURB - Fundação Universidade Regional de Blumenau, Electrical and Telecommunications, Blumenau, Brazil,

²CELESC, DPEP / DVEn, Florianopolis, Brazil

3C-12 Study of the Influence of the Contamination Accumulation on the Surface of 25 kV Insulators in Urban and Rural Areas

Luiz Meyer¹, Carlos Oliboni¹, Gustavo Cassel²

¹FURB - Fundação Universidade Regional de Blumenau, Electrical and Telecommunications, Blumenau, Brazil,

²CEEE, Distribution Coordination, Porto Alegre, Brazil

3C-13 A Least Squares Support Vector Machines (LS-SVM) Approach for Predicting Critical Flashover Voltage of Polluted Insulators

Boubakeur Zegnini¹, AbdelHalim Mahdjoubi¹, Mohammed Belkheiri²

¹ Département Génie Electrique, Université Amar Telidji, Laboratoire d'études et Développement des Matériaux Semi-conducteurs et Diélectriques, LeDMaScD, Laghouat, Algeria,

² Département Génie Electrique, Université Amar Telidji, Laboratoire signaux et systèmes de Laghouat, Laghouat, Algeria

3C-14 Hydrophobicity Evaluation of Polymer Insulator Based on Surface Discharge Characteristics

Boxue Du¹, Xinxin Cheng¹, Jie Li¹, Zongle Ma¹, Kai Wu²

¹Tianjin University, Electrical Engineering, Tianjin, China,

²Xi'an Jiaotong University, State Key Lab. of Electrical Insulation and Power Equipment, Xian, China

————— Tuesday, October 18, 2011 —————

8:00 - 10:00 Session 4 (Oral) Fluid Insulation

Chair: John Fothergill
Organizer: Berbard Noirhomme

- 4-1 Investigations on Creeping Discharges Propagating over Pressboard Immersed in Mineral and Vegetable Oils Submitted to Impulse Voltage**
Abderrahmane Beroual, Viet-Hung Dang
Ecole Centrale de Lyon - AMPERE Lab Ecully, France
- 4-2 Electrical Properties of Ester Dielectric Fluids from Palm Kernel Oil**
Abdelghaffar Abdelmalik, John Forthergill, Steven Dodd
University of Leicester, Engineering Department, Leicester, United Kingdom
- 4-3 Dielectric Breakdown Mechanism of PPLP in Liquid Nitrogen Due to Laminated Structure**
Masayuki Nagao¹, Muneaki Kurimoto¹, Ryosuke Takahashi¹, Yoshinobu Murakami¹, Takashi Nishimura², Yuichi Ashibe², Takato Masuda²
¹Toyohashi University of Technology, Department of Electrical and Electronic Information Engineering, Toyohashi, Japan,
²Sumitomo Electric Industries Ltd., Superconductivity & Energy Technology Department, Osaka, Japan
- 4-4 Fundamental Research on the Application of Nano Dielectrics to Transformers**
Rongsheng Liu, Leif A.A. Pettersson, Tommaso Auletta, Olof Hjortstam
ABB AB, Corporate Research, Power Technologies, Vasteras, Sweden
- 4-5 Moisture Equilibrium in Vegetable Oil and Paper Insulation Systems**
Zhaotao Zhang¹, Jian Li¹, Ping Zou¹, Stanislaw Grzybowski²
¹Chongqing University, Dept of High Voltage and Insulation Eng, Chongqing, China,
²Mississippi State University, Dept of Electrical and Computer Eng, Mississippi State, USA

4-6 Current Problems and Issues of Designing HVDC Converter Transformers

Juergen Fabian¹, Bernhard Jocham¹, Bernhard Nader¹, Rudolf Woschitz¹, Michael Muhr¹, Christoph Krause², Ugo Piovan²

¹Graz University of Technology, Institute of High Voltage Engineering and System Management, Graz, Austria,

²Weidmann Electrical Technology AG Rapperswil, Switzerland

10:30 - 12:30 Session 5A (Poster) Partial Discharges

Chair: Paul Lewin

Organizer: Issouf Fofana

5A-1 UHF Detection of PD in Power Transformers: The Influence of Disturbances

Andrea Cavallini¹, Hani Saad², Gian Carlo Montanari¹, Marco Tozzi³

¹University of Bologna, Dept. of Electrical Engineering, Bologna, Italy,

²Ecole Polytechnique de Montreal, Dept. of Electrical Engineering, Montreal, Canada,

³TechImp H.Q. Srl Zola Predosa, Italy

5A-2 Comparison of Ultrasonic, Electrical and UHF Characteristics of Partial Discharge Emission in Oil/Paper Insulation Systems

Andrea Cavallini¹, Jesus Rubio Serrano², Carlos Gustavo Azcarraga Ramos¹, José Antonio Garia Souto², Gian Carlo Montanari¹

¹University of Bologna, Dept. of Electrical Engr, Bologna, Italy,

²Universidad Carlos III de Madrid, Departamento de Ingeniería Eléctrica, Leganes, Spain

5A-3 Comparison of PD Characteristics and Degradation in PET Insulation with Vented and Unvented Voids

Dipasree Adhikari, Donald Hepburn, Brian Stewart

Glasgow Caledonian University, School of Engineering and Computing, Glasgow, United Kingdom

5A-4 Material Erosion and Build-up at the High Voltage Electrode During PD testing of Subsea Insulation Materials using a Modified Cigré II Test Method

Oddgeir Kvien, Gunnar Berg, Sverre Hvidsten

SINTEF Energy Research, Electric Power Technology, Trondheim, Norway

- 5A-5 Field Experiences Using Radio Frequency Scanning to Detect Partial Discharge Activity in Bus Duct and Metal Clad Switchgear of Generating and Transmission Substations**
Javier Enrique Acevedo Acevedo
Doble Engineering Company, Consultant, Bucaramanga, Columbia
- 5A-6 Partial Discharge Behaviour within Two Spherical Cavities in a Dielectric Material**
Hazlee Illias, George Chen, Paul Lewin
University of Southampton, School of Electronics and Computer Science, Southampton, United Kingdom
- 5A-7 Multisource PD Identification Based on Phase Synchronous and Asynchronous Data**
Demetres Evagorou¹, Andreas Kyprianou¹, Liwei Hao², Paul Lewin², Andreas Stavrou³, George Georghiou¹
¹University of Cyprus, School of Engineering, Nicosia, Cyprus,
²University of Southampton, School of Electronics and Computer Science, Southampton, United Kingdom,
³The Electricity Authority of Cyprus Nicosia, Cyprus
- 5A-8 Pressure and Temperature Effect on the Pashen Curve**
Elyse Sili¹, Flavien Koliatene², Jean Pascal Cambronne¹
¹Toulouse University, Plasma and Energy Conversion Laboratory, Toulouse, France,
²Labinal, Toulouse, France
- 5A-9 The Comparison of Sensitivity Between the UHF and Ultrasonic Methods for Partial Discharge Detecting in GIS**
Bibo Geng, Chengrong Li, Bo Qi, Le Yu, Jixin Gao
North China Electric Power University, High Voltage and EMC Beijing Area Major Laboratory, Beijing, China
- 5A-10 Diagnosis of Severity Degree for Power Transformer Oil/pressboard Insulation Surface Discharge**
Wei Wang, Bing Zhou, Jianfeng Xu, Chengrong Li
North China electric power university, high voltage and EMC key laboratory, Beijing, China

5A-11 Experimental Research on the Transformer Winding Inter-Turn Discharge Caused by Corrosive Sulphur

Ming Chen, Yangchun Cheng, Changjin Diao, Hongxin Ji, Jianliang Kong, Anqi Song North China Electric Power University, School of Electric and Electronic Engineering, Beijing, China

5A-12 Creepage Discharge Performance for High Moisture Pressboard

Wei Wang¹, Bin Bao², Jianfeng Xu¹, Bing Zhou¹, Chengrong li¹
¹North China Electric Power University, High Voltage and EMC key laboratory, Beijing, China,
²North east power grid Shenyang, China

5A-13 Experimental Research on the Evolution of Creepage Discharge in Aged Pressboard

Jianfeng Xu, Wei Wang, Chengrong Li, Xin Wang, Bing Zhou
North China Electric Power University, High Voltage&EMC Beijing Area Major Laboratory, Beijing, China

5A-14 Measurement of Partial Discharge Activities within Two Artificial Spherical Voids in an Epoxy Resin

Hazlee Illias, George Chen, Paul Lewin
University of Southampton, School of Electronics and Computer Science, Southampton, United Kingdom

5A-15 Morphologic Analysis and Diagnosis of Defects Inside Cast Resin Medium Voltage Current Transformers Insulation by Digital Partial Discharges Acquisitions

Francesco Guastavino¹, Andrea Dardano², Federico Ferraro³, Massimo Secci³, Stefano Squarcia¹, Eugenia Torello¹
¹University of Genova, Naval and Electrical Engineering, Genova, Italy,
²Diasol S.r.l.Genova, Italy,
³Schneider Electric Italy Cairo Montenotte (SV), Italy

5A-16 Recognition of Partial Discharges using an Ensemble of Neural Networks

A. Abubakar Mas'ud , B.G. Stewart, S.G. McMeekin and A. Nesbitt
School of Engineering and Built Environment, Glasgow Caledonian University, Glasgow, United Kingdom.

10:30 - 12:30 Session 5B (Poster) Pre-breakdown and Surface Flashover

Chair: Mahmoud Abou-Dakka

Organizer: Enis Tuncer

5B-1 Fractal Analysis of Creeping Discharge Propagating over Pressboard Immersed in Mineral and Vegetable Oils

Abderrahmane Beroual, Viet-Hung Dang

Ecole Centrale de Lyon - AMPERE Lab Ecully, France

5B-2 A Deeper insight into the Application of the Enlargement Law to HVDC Cables

Massimo Marzinotto¹, Giovanni Mazzanti²

¹TERNA S.p.A. Roma, Italy,

²University of Bologna, Department of Electrical Engineering, Bologna, Italy

5B-3 Lightning and Switching Impulse Level Selection for Long DC Extruded Cable Lines

Massimo Marzinotto¹, Giovanni Mazzanti², Carlo Mazzetti³

¹TERNA S.p.A. Roma, Italy,

²University of Bologna, Department of Electrical Engineering, Bologna, Italy,

³University of Roma, Electrical Engineering Department, Roma, Italy

5B-4 Comparison between RF and Electrical Signals from the Partial Discharge Activity of Twisted Pair Cables at Reduced Pressures

Martin Given, Ronald Mason, Martin Judd, Phil McGlone, Igor Timoshkin, Mark Wilson

University of Strathclyde, Electronic and Electrical Eng, Glasgow, United Kingdom

5B-5 Impulse Breakdown of Extruded Cable Insulation Materials

Rongsheng Liu¹, Carl-Olof Olsson¹, Gustavo Dominguez¹, Andreas Farkas², Marc Jeroense²

¹ABB AB, Corporate Research, Power Technologies, Vasteras, Sweden

²ABB Power Systems, High Voltage Cables, Karlskrona, Sweden

5B-6 Effects Due To Metallic Particle Contaminations in SF₆/N₂ Gas Insulated Busduct

Nagabhushan Patil¹, Amarnath Jinka², Subbarayudu Dubbisetty³

¹P.D.A. College of Engineering, Electrical and Electronics engineering,
Gulbarga, India,

²J.N.T.U.H College of Engineering, Electrical and Electronics engineering,
Hyderabad, India,

³G.Pulla Reddy engineering College, Electrical and Electronics
Engineering, Kurnool, India

5B-7 Metallic Particle Trajectory in an Isolated Conductor Gas Insulated Busduct (GIB) with Dielectric Coated Enclosure using Charge Simulation Method

Rama Rao Narapareddy¹, Amarnath Jinka²

¹Nigama Engineering College, Electrical and Electronics Engineering,
Karimnagar, India,

²JNTUH College of Engineering, Electrical and Electronics Engineering,
Hyderabad, India

5B-8 Modeling of the Breakdown Voltage of Solid Insulating Materials Using Fuzzy Logic Techniques

Sanjeeb Mohanty¹, Saradindu Ghosh²

¹nit Rourkela, Electrical Engineering, Rourkela, India,

²nit Durgapur, Electrical Engineering, Durgapur, India

5B-9 Discharge Channel Propagation Process and Impulse Breakdown Mechanism under Non-Uniform Electric Field in Air

Katsuki Hotta¹, Takeshi Iwata¹, Hiroki kojima¹, Naoki Hayakawa¹,
Norihiro Yanagita², Tatsuro Kato², Toshiaki Rokunohe², Hitoshi Okubo¹

¹Nagoya University, Electric Engineering and Computer Science, Nagoya,
Japan,

²Hitachi Ltd., Energy and Environmental Systems Laboratory, Hitachi,
Japan

5B-10 Investigations Regarding Partial Discharges at Spacer Configurations Concerning Endwinding Design of Form Wound High Voltage Stator Windings

Markus Lerchbacher¹, Denis Imamovic¹, Gerhard Lemesch², Franz
Ramsauer², Michael Muhr¹

¹Graz University of Technology, Institute of High Voltage Engineering and
System Management, Graz, Austria,

²Andritz Hydro GmbH Weiz, Austria

5B-11 Compatibility Evaluation between Dielectric Breakdown Strength and Thermal Conduction in Epoxy/Boron-nitride Composite

Muneaki Kurimoto, Yutaka Takenaka, Yoshinobu Murakami, Masayuki Nagao
Toyohashi University of Technology, Department of Electrical and Electronic, Information Engineering, Toyohashi, Japan

5B-12 Flashover and Breakdown Characteristics in Low Pressure Environments

Donald Kasten¹, Stephen Sebo¹, Dennis Grosjean², Daniel Schweickart³

¹The Ohio State University, Electrical & Computer Engineering, Columbus, OH, USA,

²Innovative Scientific Solutions, Inc. Dayton, OH, USA,

³Air Force Research Laboratory Wright-Patterson AF Base, OH, USA

5B-13 Dynamic Arc Model of the Flashover of the Polluted Insulators

Sid Ahmed Bessedik, Hocine Hadi

Faculty of Electrical Engineering, Electrotechnical, Bp 1505 El Mnaouer Oran 31000, Algeria

5B-14 The Electric Field Modelling of A High Voltage Bushing with Contaminant on The Lower Porcelain Surfaces

David Smith, Scott McMeekin, Brian Stewart, Peter Wallace

Glasgow Caledonian University, School of Engineering & Computing, Glasgow, Scotland

5B-15 Modeling Pollution Flashover of Insulators Considering Dynamics of Dry Band Arcing

Lin Bo, Ravi Gorur

Arizona State University, Ira A. Fulton Schools of Engineering, Tempe, AZ, USA

5B-16 Exploration of Self-Produced Vacuum Ultraviolet Radiation from Dielectric Surface Flashover at Atmospheric Pressure

George Laity, Andrew Fierro, Lynn Hatfield, Andreas Neuber

Texas Tech University, Center for Pulsed Power and Power Electronics, Lubbock, TX, USA

5B-17 Effects of Orientation with Respect to Gravity for a Wireplate Convergent Angle Electrohydrodynamic Gas Pump

Adam Lipchitz, Glenn Harvel

UOIT, Faculty of Energy Systems and Nuclear Science, Oshawa, ON, Canada

5B-18 Parameters Affecting the Static Electrification of Aged Transformer Oils

Janvier Sylvestre N'Cho¹, Issouf Fofana², Thomas Ngnui Aka¹,
Abderrahmane Beroual¹

¹Ecole Centrale de Lyon, Electrical Engineering, Lyon, France,

²UQAC, Applied Sciences, Chicoutimi, QC, Canada

10:30 - 12:30 Session 5C (Poster) Aging

Chair: Andrej Krivda

Organizer: Hulya Kirkici

5C-1 Electroinsulating Fluids – New Insulating Mixtures

Pavel Trnka¹, Vaclav Mentlik¹, Jaroslav Cerny²

¹University of West Bohemia, FEL-KET, Plzen, Czech Republic,

²Institute of Chemical Technology of Prague, Faculty of Environmental
Technology, Prague, Czech Republic

5C-2 Research of the Electrical Trees Growth and PD in HV XLPE Cable

Wei Wang¹, Heng Sui², Yanlong Yu¹, Yankun Wu¹

¹North China Electric Power University, Beijing Key Laboratory of High
Voltage & EMC, Beijing, China,

²Shandong Electric Power Corporation Jinan, China

5C-3 Research of Insulation Properties of Polymer Materials Using in Oil-Filled Transformers under High Temperature

Youping Tu¹, Weizhong Sun², Caipeng Yue¹, Guanghui Chen¹

¹North China Electric Power University, Beijing Key Laboratory of High
Voltage & EMC, Beijing, China,

²Yunan Electric Power Research Institute Kunming, China

5C-4 Insulation Diagnosis of Motor Winding Based on Feature Distributions

Mitsuhiro Kishino¹, Yukio Mizuno¹, Hisahide Nakamura²

¹Nagoya Institute of Technology Nagoya, Japan,

²TOENEC Corporation Nagoya, Japan

5C-5 Studies on the Impulse Aging Characteristic of ZnO Varistor Using the Space Charge Technology

Hang Cui, Youping Tu, Qian Wang, Zenghui Zheng

North China Electric Power University, Beijing Area Major Laboratory of
High Voltage and EMC, Beijing, China

5C-6 Electrical Ageing Tests on Enameled Wire Exposed to Gamma Irradiation

Francesco Guastavino¹, Alessandro Ratto¹, Gianfranco Coletti¹, Andrea Dardano¹, Eugenia Torello¹, Pietro Alessandro Di Maio², Fedele D'Aleo², Gioacchino Micciché³, Francesco Becchi⁴, Franco Talpone⁵

¹University of Genova, Naval and Electrical Engineering, Genova, Italy,

²University of Palermo, Nuclear Engineering, Palermo, Italy,

³Enea Centro Ricerca Brasimone Bologna, Italy,

⁴Telerobot Genova, Italy,

⁵Moog Italiana Genova, Italy

5C-7 An Analogy for Estimation of Dielectric and Mechanical Strengths of Insulators at Elevated Temperature

Huseyin Hiziroglu¹, Iosif Shkolnik²

¹Kettering University, Electrical & Computer Engineering, Flint, MI, USA,

²Kettering University Flint, MI, USA

5C-8 Analysis of Influence of Thermal and Voltage Treatments on Silicone/Mica Electrical Insulation by FTIR ATR

R. Polanský, P. Prosr, V. Mentlík

University of West Bohemia, Univerzitiní 26, Pilsen, Czech Republic

5C-9 A New Method of Lifetime Estimation for High-Voltage Insulating Systems in Rotating Machines

P. Prosr, V. Mentlík, and R. Polanský

University of West Bohemia, Univerzitiní 26, Pilsen, Czech Republic

5C-10 Study of Degradation Processes of Two- and Three Component Insulating Composites

P. Trnka, V. Mentlík, P. Prosr, R. Polanský

University of West Bohemia in Pilsen, Faculty of Electrical Engineering,

Univerzitiní 26, Plzen, Czech Republic

5C-11 Evaluation of Organic Peroxide Decomposition Byproducts from Incompletely Crosslinked High Voltage Power Cables

Suh Joon Han¹, Jerker Kjellqvist²

¹The Dow Chemical Company, Wire and Cable, Piscataway, NJ, USA,

²The Dow Chemical Company, Wire and Cable, Horgen, Switzerland

5C-12 A Comparative Study of the Ageing Process in Kraft Paper and Pressboard

Zhong Zheng, Zhiyang Jin, Min Chen, Lihua Chen
North China Electric Power University, Electrical Engineering, Beijing, China

————— **Wednesday, October 19, 2010** —————

8:00 - 10:00 Session 6 (Oral) Nanodielectrics

Chair: Toshikatsu Tanaka
Organizer: Alun Vaughan

6-1 Introducing the Polymer Chain Alignment Model for Explaining Experimental Results Unique to Polymer-Based Nanocomposites

Thomas Andritsch, Roman Kochetov, Peter Morshuis, Johan Smit
Delft University of Technology, High Voltage Technology & Management, Delft, Netherlands

6-2 Evolution of Some Dielectric Properties of Polypropylene-Organoclay Nanocomposites with DC Poling

Mahmoud Abou-Dakka, Ladji Cisse, Alexander Bulinski, Soli Bamji
National Research Council of Canada, National Measurement Standards, Ottawa, ON, Canada

6-3 Enhancements of Epoxy Resin Based Syntactic Foam by Inner Interface and Matrix Modifications

Anja Strauchs, Armin Schnettler
RWTH Aachen University, Institute for High Voltage Technology, Aachen, Germany

6-4 An Investigation into Improving the Breakdown Strength and Thermal Conduction of an Epoxy System Using Boron Nitride

Martin Reading, Zhiqiang Xu, Alun Vaughan, Paul Lewin
University of Southampton, The Tony Davies High Voltage Laboratory, Southampton, United Kingdom

**6-5 Dielectric Properties of Electrospun Barium Titanate
Fibers/Graphene/Silicone Rubber Composites**

Zepu Wang¹, J. Keith Nelson², Nikhil Koratkar³, Henrik Hillborg⁴, Su Zhao⁴, Linda S.Schadler¹

¹Rensselaer Polytechnic Institute, Materials Science and Engineering Department, Troy, NY, USA,

²Rensselaer Polytechnic Institute, Electrical, Computer, and Systems Engineering Department, Troy, NY, USA,

³Rensselaer Polytechnic Institute, Mechanical, Aerospace and Nuclear Engineering Department, Troy, NY, USA,

⁴ABB Corporate Research, Power Technology, Västerås, Sweden

**6-6 Space Charge Behavior of Epoxy Based Nanocomposite
Materials with a High Nanofiller Content**

Laurent Banet¹, Ioana Preda¹, Jérôme Castellon¹, Serge Agnel¹, Michel Fréchette², Hugues Couderc³, Eric David³, Andrej Krivda⁴, Lars E. Schmidt⁴

¹Université Montpellier 2, Institut d'Electronique du Sud, Montpellier, France,

²Institut de recherche d'Hydro-Québec Varennes, QC, Canada,

³Ecole de Technologie Supérieure, Montreal, QC, Canada,

⁴ABB Switzerland Ltd, Corporate Research, Baden-Dättwil, Switzerland

10:30 - 12:30 Session 7A (Poster) Nanodielectrics and Polarisation

Chair: Nicola Bowler

Organizer: Jérôme Castellon

**7A-1 The effect of Temperature on Space Charge Behavior of Epoxy Resins
Containing both Micro and Nano Sized Fillers**

Davide Fabiani¹, Gian Carlo Montanari¹, Fabrizio Palmieri¹, Andrej Krivda²

¹University of Bologna, Dept. of Electrical Eng., Bologna, Italy,

²ABB Switzerland Ltd, Corporate Research, Baden-Daettwil, Switzerland

7A-2 AC and Lighting Breakdown Strength of Transformer Oil Modified by Semiconducting Nanoparticles

Jian-quan Zhou¹, Yue-fan Du¹, Mu-tian Chen¹, Xiao-xin Li², Yu-zhen Lv², Cheng-rong Li¹

¹Beijing Key Laboratory of High Voltage & EMC, North China Electric Power University, Beijing, China,

²School of Energy, Power and Mechanical Engineering, North China Electric, Beijing, China

7A-3 Dielectric Study of a Cycloaliphatic UV-curable Epoxy Resin Copolymerized with a Low Glass Transition Comonomer Bearing Methylene Units

Christele Vanga Bouanga¹, Hugues Couderc¹, Giulio Malucelli², Michel Fréchette¹, Giovanni Camino², Sylvio Savoie¹, Jerome Castellon³, Laurent Banet³

¹Institut de recherche d'Hydro Québec(IREQ), Expertise Science des matériaux, Varennes, QC, Canada,

²Politecnico di Torino (POLITO), Dipartimento di Scienza dei Materiali ed Ingegneria Chimica, Torino, Italy,

³Université de Montpellier, Institut d'électronique du Sud, Montpellier, France

7A-4 Dielectric Response of Various Partially Cured Epoxy Nanocomposites

Ioana Preda¹, Hugues Couderc², Michel Frechette², Sylvio Savoie², Fengge Gao³, Rinat Nigmatullin³, Simon Thompson³, Jerome Castellon¹

¹Institut d'Electronique du Sud, Université Montpellier 2, Montpellier, France,

²Institut de Recherche d'Hydro-Québec, IREQ, Varennes, QC, Canada,

³School of Science and Technology, Nottingham Trent University, Nottingham, United Kingdom

7A-5 Effect of Nanoparticles on the Dielectric Strength of Aged Transformer Oil

Yue-fan Du¹, Jian-quan Zhou¹, Mu-tian Chen¹, Cheng-rong Li¹, Xiao-xin Li², Yu-zhen Lv²

¹North China Electricity Power University, Electrical and Electronic, Beijing, China,

²North China Electricity Power University, School of Energy, Power and Mechanical Engineering, Beijing, China

- 7A-6 Improving Partial Discharge Resistance of Hydrophobic Epoxy Resins with Nano-Filler Dispersion**
Takahiro Imai, Hiroaki Cho, Kenichi Yamazaki, Hiroki Sekiya, Tamon Ozaki
Toshiba Corporation, Power and Industrial Systems R&D Center, Tokyo, Japan
- 7A-7 Effect of Pulse Stress on Surface Charge Accumulation and Decay of Epoxy Nanocomposites with TiO₂ Particles**
Boxue Du¹, Jiwei Zhang¹, Kai Wu², Yu Gao¹
¹Tianjin University, Electrical Engineering, Tianjin, China,
²Xi'an Jiaotong University, State Key Lab. of Electrical Insulation and Power Equipment, Xian, China
- 7A-8 Partial Discharge-Induced Degradation Characteristics of Epoxy/TiO₂ Nanocomposite**
Boxue Du¹, Jie Li¹, Kai Wu², Yong Liu¹
¹Tianjin University, Electrical Engineering, Tianjin, China,
²Xi'an Jiaotong University, State Key Lab. of Electrical Insulation and Power Equipment, Xian, China
- 7A-9 Mechanical Properties of Polypropylene Nanocomposites: an Investigation about the Correlation with Space Charge Measurements**
Francesco Guastavino¹, Gianfranco Coletti¹, Eugenia Torello¹, Zina Vuluga², Denis Mihaela Panaitescu², Stela Iancu²
¹University of Genova, Naval Electrical Engineering, Genova, Italy,
²The National Research and development Institute for Chemistry and Petrochemistry Bucharest, Rumania
- 7A-10 The Role of Nano and Micro Particles on Dielectric Strengths in Epoxy Composites**
Zhe Li¹ and Toshikatsu Tanaka²
¹Shanghai Jiao Tong University, Department of Electrical Engineering, 800 Dongchuan Road, Minhang, Shanghai 200240, China
²Waseda University, IPS Research Center, 2-7 Hibikino, Wakamatsu-ku, Kitakyushu-shi, 808-0135, Japan

7A-11 High Thermal Conductivity Epoxy/BN Composites with Sufficient Dielectric Breakdown Strength

Toshikatsu Tanaka¹, Zengbin Wang¹, Tomonori Iizuka¹, Masahiro Kozako¹, Yoshimichi Ohki²

¹Waseda University, IPS Research Center, Kitakyushu, Japan,

²Kyushu Institute of Technology, Department of Electrical Engineering and Electronics, Kitakyushu, Japan,

7A-12 Frequency Domain Dielectric Response of Syndiotactic Polypropylene Insulated Miniature Cables at High Temperatures and Electric Fields

Frode Saethre, Sverre Hvidsten

SINTEF Energy Research, Electric Power Technology, Trondheim, Norway

7A-13 Study on Voltage Maintaining Performance of Metallized Film Capacitors under High Electric Fields

Hua Li, Yaohong Chen, Fuchang Lin

College of Electrical & Electronic Engineering, HuaZhong University of Science and Technology, Wuhan, China

7A-14 Change from Second Order to First Order Ferroelectric Phase Transition by Polarization Induced Strain

Herbert Kliem

Saarland University, Electrical Engineering Physics, Saarbruecken, Germany

7A-15 Dielectric Properties of Colossal Permittivity Materials: an Update

Chafé Cheballah¹, Zarel Valdez-Nava¹, Lionel Laudebat², Thierry Lebey¹, Pierre Bidan¹

¹Université de Toulouse UPS, INPT, CNRS, Laplace (Laboratoire Plasma et Conversion d'Énergie), Toulouse, France,

²Centre Universitaire Jean-François Champollion Albi, France

7A-16 Ionic Liquids Induce Crystalline β Phase and Ferroelectric Polarization in Sub-Micrometer Films of Poly(vinylidene fluoride) (PVDF)

Feipeng Wang¹, Alexander Lack¹, Zailai Xie², Peter Frübing¹, Werner Wirges¹, and Reimund Gerhard¹

¹Applied Condensed-Matter Physics, Institute of Physics and Astronomy, Faculty of Science, University of Potsdam, Karl-Liebknecht-Strasse 24-25, 14476 Potsdam, Germany

²Institute of Chemistry, Faculty of Science, University of Potsdam, Karl-Liebknecht-Strasse 24-25, 14476 Potsdam, Germany

7A-17 The Dielectric Permittivity of Ceramic Powders used in Composite Polymers

Christele Vanga Bouanga¹, Sylvio Savoie¹, Hugues Courderc¹, Michel Fréchette¹, Éric David²

¹Institut de recherche d'Hydro Québec (IREQ), Expertise Science des matériaux, Varennes, QC, Canada,

²École de Technologie Supérieure (ETS), Montréal, QC, Canada

10:30 - 12:30 Session 7B (Poster) Pre-breakdown and Treing

Chair: Husseyin Hizioglu

Organizer: Vijendra Agarwal

7B-1 Gas Generation Characteristics of Oil-paper Composite Insulations under ACDC Voltage Source in the process of arcing

Yuanxiang Zhou, Yanchao Sha, Xinxin Jiang, Qinghua Sun, Yunshan Wang, Jihuan Tian Tsinghua University, Dept. of Electrical Engineering, Beijing, China

7B-2 Particle-Initiated Breakdown in Gas-Insulated Co-Axial Configuration

M. M. El Bahy, S. A. Ward, R. Morsi, M. Badawi

Benha University, Faculty of Engineering, Cairo, Egypt

7B-3 The Simulation of Streamer Dynamics in the Air Gap

Lin Zhang¹, Jian-feng Hui², Xiao-bo Meng¹, Xing-ming Bian¹, Li-ming Wang¹, Zhi-cheng Guan^{1,3}

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7B-4 Dielectric Breakdown of An Epoxy / Quartz Composite and a Nanostructured Epoxy / Quartz / Montmorillonite Composite. Influence of Electrode Geometry.

Hugues Couderc¹, Yannis Corlu¹, Sylvio Savoie¹, Michel Fréchet¹, Eric David²

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²Ecole de Technologie Supérieure, Montréal, QC, Canada

7B-5 Measurement and Modeling of the DC Dielectric Strength of Pure, Nano-Filled and Micro-Filled PEI Resin

Manh Quan Nguyen¹, Dominique Mary¹, David Malec¹, P. Werynski², B. Gornicka²

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7B-6 Parameters Affecting the DC Breakdown Strength of Parylene F Thin Films

Rabih Khazaka, Mireille Bechara, Sombel Diahm, Marie-Laure Locatelli
Université de Toulouse, UPS, INPT, LAPLACE, CNRS, Toulouse, France

7B-7 Pre-breakdown Current in Long Transformer Oil Gaps with Insulating Barrier under AC Voltage

Guebas Fettouma¹, Boubakeur Ahmed¹, Beroual Abderrahmane²

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²Ecole Centrale de Lyon, Centre de Génie Electrique de Lyon, Electrical Engineering, Lyon, France

- 7B-8 Optimization of Grading Ring Design for a New Type of UHV Equipotential Shielding Capacitive Voltage Transformer**
Lingdong Xie¹, Jianchao Zheng², Zhiqi Li², Wei Dong², Kunpeng Zha²,
Guangfu Tang²
¹Tsinghua University, Dept. of Electrical Engineering, Beijing, China,
²China Electric Power Research Institute, Beijing, China
- 7B-9 Influence of Irregularities within Electric Fields in High Voltage Cables**
S. Gutierrez, I. Sancho, L. Fontan
University of Navarra, CEIT and TECNUN, San Sebastián, Spain
- 7B-10 Influence of Semi-Crystalline Morphology on the Electrical Properties of SPP Based Materials**
Francesco Guastavino¹, Abdul Salam Thelakkadan¹, Stefano Squarcia¹,
Pilar Tiemblo², Josè Manuel Gómez-Elvira²
¹University of Genova, Naval and Electrical Engineering, Genova, Italy,
²Consejo Superior de Investigacion Cientifica Madrid, Spain
- 7B-11 Two-Dimensional Simulation of the Negative Streamer in N₂ between Parallel-Plate Electrodes**
Zheng Dian-chun, Zhu Shi-hua, Zhang Zhong-lin, Lv Shu-ming
Harbin University of Science and Technology, Key Laboratory of
Engineering Dielectric and Its Application, Ministry of Education, Harbin,
China
- 7B-12 Effect of Space Charges on the Corona Onset in the Short-Gap Insulated SF₆ under Non-uniform Fields**
Zheng Dian-chun, Zhu Shi-hua, Lv Shu-ming, Zhao Da-wei
Harbin University of Science & Technology, Key Laboratory of
Engineering Dielectric and Application, Ministry of Education, Harbin,
China
- 7B-13 Development of a Software Tool to Evaluate Electrical Tree Growth Images**
Sanjay Bahadoorsingh¹, Ravi Balliram¹, Chandrabhan Sharma¹, Simon
Rowland²
¹The University of the West Indies, Department of Electrical and Computer
Engineering, St Augustine, Trinidad and Tobago,
²The University of Manchester, School of Electrical and Electronic
Engineering, Manchester, United Kingdom

7B-14 The Statistical Analysis of Harmonic Influenced Electrical Treeing Partial Discharge Data Using the Weibull Distribution

Sanjay Bahadoorsingh¹, Samantha Sambeharry¹, Chandrabhan Sharma¹, Simon Rowland²

¹The University of the West Indies, Electrical and Computer Engineering, St. Augustine, Trinidad and Tobago,

²The University of Manchester, School of Electrical and Electronic Engineering, Manchester, United Kingdom

7B-15 Pulse Sequence Analysis on PD data from Electrical Trees in Flexible Epoxy Resins

Nikola Chalashkanov, Stephen Dodd, John Fothergill, Len Dissado
University of Leicester, Engineering, Leicester, United Kingdom

7B-16 Three-Dimensional Tree Simulation Considering the Interfaces with Various Angles of Inclination to an Electric Force Line

Youngbum Ju¹, Hiroaki Uehara¹, Katsutoshi Kudo²

¹Kanto Gakuin University, Electrical, Electronic and Information, Yokohama, Japan,

²Meiji University, Electronic and Bioinformatics, Kawasaki, Japan

7B-17 Influence of H₂O Molecules on Electrical Tree Initiation in Silicone Rubber

Sachie Muroga, Yuji Muramoto, Noriyuki Shimizu
Meijo University, Electrical and Electronic Engineering, Nagoya, Japan

7B-18 Effects of Frequency on Treeing Phenomena in Silicone Rubber

Boxue Du¹, Zongle Ma¹, Yu Gao¹, Tao Han¹, Kai Wu²

¹Tianjin University, Electrical Engineering, Tianjin, China,

²Xi'an Jiaotong University, Electrical Engineering, Xian, China

7B-19 The Design and Test of Dielectric Low-Temperature Electrical Characteristics Test System

Guifeng Zhang, Tianye Niu, Hao Zhang, Youping Tu, Lijian Ding
North China Electric Power University, Key Laboratory of High Voltage & EMC, Beijing, China

7B-20 AC Breakdown Properties of Ice-Glycerin Mixed System at 77 K

Ryohei Tsuchiya, Yuji Muramoto, Noriyuki Shimizu
Meijo University, Electrical and Electronic Eng, Nagoya, Japan

14:00 - 16:00 **Session 8 (Oral) Charge Storage and Transport**

Chair: Eric David
Organizer: Michel Fréchet

- 8-1 Computational Quantum Mechanics Study of Insulating Polyethylene-Metal Electrode Interface**
Ahmed Huzayyin¹, Steven Boggs^{1,2}, Ramamurthy Ramprasad²
¹University of Toronto, ECE, Toronto, ON, Canada
²University of Connecticut, Institute of Materials Science, Storrs, CT, USA
- 8-2 A Procedure For Space Charge Measurements in Full-Size HVDC Extruded Cables**
Massimo Marzinotto¹, Giovanni Mazzanti²
¹TERNA S.p.A Roma, Italy
²University of Bologna, Department of Electrical Engineering, Bologna, Italy
- 8-3 Charge Injection Studies on XLPE Surfaces Exposed to Partial Discharges**
Vicente Rodolfo Garcia-Colon
Instituto de Investigaciones Electricas, Centro de Posgrado, Cuernavaca, Morelos, Mexico
- 8-4 Post-Electronic Irradiation Measurements by PEA and FLIMM Methods on Dielectric Films**
Virginie Griseri, Xuan-Truong Nguyen, Sihem Bouchareb, Laurent Berquez
Université de Toulouse, UPS, INPT, LAPLACE, Toulouse, France
- 8-5 Behavior of Ions in Electric Double Layer**
Yohei Fujii, Yuji Muramoto, Noriyuki Shimizu
Meijo University, Electrical and Electronic Engineering, Nagoya, Japan
- 8-6 Modelling Electroluminescence in Insulating Polymers under Sinusoidal Stress: Effect of Applied Voltage, Frequency and Offset**
Fulbert Baudoin¹, Severine Le Roy¹, Gilbert Teysedre¹, Christian Laurent¹, David H Mills², Paul L Lewin²
¹Laplace, Toulouse, France
²The Tony Davies High Voltage Laboratory Southampton, United Kingdom