# 2023 IEEE 41st Electrical Insulation Conference (EIC)

# TECHNICAL PROGRAM

The 41st Electrical Insulation Conference is organized including two plenary sessions: ten technical sessions, being eight sessions of oral presentations and two poster sessions.

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| --- | --- | --- |
| **Session Name** | **Topics** | **Session Chair** |
| Ca&A – S1 | Cables & Accessories | Winkeler, Mark |
| RM – S1 | Rotating Machines | Sitler, Shannon |
| RM – S2 | Rotating Machines | Williams, Mike |
| NM – S1 | New Materials/Failure Analysis | Gegenava, Anna |
| PD – S1 | Partial Discharges | Park, Chanyeop |
| TT – S1 | Testing Technologies | Stanciulescu, Giuseppe |
| TR – S1 | Transformers | Zhu, Hugh |
| TR – S2 | Transformers | Chiang, Solomon |
| PS -01 | Poster Session 1: Rotating Machines, Cables & Accessories, Outdoor Insulation, Switchgear (including arrestors), New Materials |  |
| PS -02 | Poster Session 2: Transformers, Testing Technologies, Nanodielectrics, Transportation Systems, Partial Discharge |  |
| PLS - 01 | Keynote Speaker - Dr. Robert Fry |  |
| PLS - 02 | Plenary Speaker - Francois Brassard, VP Integrated Energy System Design and Technology Projects with Hydro-Quebec |  |

**Presentations**

**C&A - S1: Cables and Accessories**

*Time:*Monday, 19/June/2023: 10:00am - 12:00pm  ·  *Location:*2101  
*Session Chair:*Mark Winkeler

Maximum number of presentations for this session: 6

**10:00am - 10:20am**

**Analysis of Hot Spots within Cable Tunnels using Thermal Simulations**

**G. Callender1, K. Goddard1, O. Vryonis1, T. Andritsch1, P. Lewin1, S. Gao2**

1University of Southampton, United Kingdom; 2National Grid Electricity Transmission, United Kingdom

**10:20am - 10:40am**

**Failure of the Secondary Electrical Network Grid System, Causes and Remediation**

**W. J Chatterton, J. Steele, N. Laurie**

Novinium, United States of America

**10:40am - 11:00am**

**Condition Assessment of Long HVDC cables**

**P. Lewin1, S. Christou2**

1University Of Southampton, United Kingdom; 2RINA Ltd, United Kingdom

**11:00am - 11:20am**

**Developing an Electromechanical Test Technique for Dynamic Cables**

**F. Hu1, C. Emersic1, L. Chen1, S. Rowland1, A. Ebrahim2**

1The University of Manchester, United Kingdom; 2ORE Catapult, United Kingdom

**11:20am - 11:40am**

**Fabrication and Simulation of Nonlinear Resistive Field Grading Materials for Electric Field Tailoring of HVDC Cable Joint**

**O. Faruqe1, P. C. Saha1, N. Uzelac2, C. Park1**

1University of Wisconsin-Milwaukee, USA; 2G&W Electric Company, Bolingbrook, IL 60440, USA

**11:40am - 12:00pm**

**Sequence Impedance Measurement for Underground Power Cables**

**J. {. Guo, N. Hampton, M. Arab Baferani**

UL Solutions, United States of America

**RM - S1: Rotating Machines - No. 1**

*Time:*Monday, 19/June/2023: 10:00am - 12:00pm  ·  *Location:*2104 A&B  
*Session Chair:*Shannon Sitler

Maximum number of presentations for this session: 6

**10:00am - 10:20am**

**Thermal cycling test as a quality control and/or acceptance test for HV form-wound stator coils and bars**

**A. Shaikh**

Kinectrics, Canada

**10:20am - 10:40am**

**Development of a Methodology to Automatically Identify Active PD Sources from Phase Resolved Partial Discharge Patterns**

**M. Levesque, R. Zemouri**

IREQ Hydro-Québec, Canada

**10:40am - 11:00am**

**Alternative method to characterize the electrical tree propagation in micaceous insulating materials**

**F. PEREIRA, T. LAMAS, J. CORDEIRO, T. AOKY, T. HILDINGER, Z. JIPING**

VOITH HYDRO

**11:00am - 11:20am**

**Factors influencing the patrial discharge inception voltage in Type I insulation systems**

**F. Sahlén1, M. Takala2**

1ABB Corporate Research, Sweden; 2ABB IEC Low Voltage Motors, Finland

**11:20am - 11:40am**

**Evaluating Stator Core Interlamination: High Flux Test of Large AC Electric Machines using Telemetry**

**É. Cloutier-Rioux1, J.-F. Létourneau1, J. Picard2, H. K. Tu1**

1Intégration et ingénierie, Hydro-Quebec, Canada; 2Institut de recherche IREQ, Hydro-Quebec, Canada

**11:40am - 12:00pm**

**Lessons Learned from a Thermal Cycling Fire**

**R. Draper**

Andritz Hydro, Canada

**PS-01: Poster Session 1**

*Time:*Monday, 19/June/2023: 1:30pm - 3:00pm  ·  *Location:*2000C

**Deterioration of Corona Armor Tape by Partial Discharge and its Lifetime Evaluation for Form-wound Rotating Machine**

**Y. Yamanaka1, T. Umemoto1, R. Ikeda2, N. Okajima2, T. Sakurai2, T. Okamoto2**

1Mitsubishi Electric Corporation, JAPAN; 2Toshiba Mitsubishi-Electric Industrial Systems Corporation, JAPAN

**Study on the Characterization of the Electromagnetic Probe with PRPD Pattern Analysis on Spherical Cavities in Epoxy**

**A. Simard1, M. Lévesque2, É. David1**

1École de Technologie Supérieure, Canada; 2Hydro-Québec, Canada

**Minimizing The Phenomenon of Vibration Sparking Through Reinforcement to Correct Partial Discharge Inception Voltage: A Case Study**

**Y. Baskoro, A. Winardi, S. Sujadi, I. Jaya, E. Nugroho, D. Panji, A. Hamzah, A. Fauzi, K. Kusnendar**

PT. PLN Indonesia Power, Indonesia

**INVESTIGATIONS ON DIFFERENT POLYMERS USED FOR INSULATION IN E-MOBILITY APPLICATIONS**

**L. Stahl, P. Werle**

Leibniz Universität Hannover, Institute of Electric Power Systems, High Voltage Technology and Asset Management, Schering-Institute, Germany

**Study on insulation of stator bars from a hydro generator**

**A. D. Garðarsdóttir1, H. Edin2**

1Vattenfall, Sweden; 2KTH, Sweden

**Establishing Stator Winding Insulation Systems Life Following Industry Standards for Thermal Classification**

**S. U. Haq, K. BVM, M. TS Moorthy**

General Electric, Canada

**Influence of Natural Ester Admixture to Mineral Oil on the Transformer Bubbling Inception Temperature**

**G. Gmati1, P. Picher2, O. Arroyo-Fernandez2, I. Fofana1, D. Rebaine1, U. Mohan Rao1**

1University of Quebec at Chicoutimi UQAC, QC, Canada; 2Research Institute Hydro-Québec Varennes, Canada

**High Voltage Inductor Design for Synthetic Testing of a Supercritical CO2 Circuit Breaker**

**M. S. A. Hossain, C. Park**

University of Wisconsin - Milwaukee, United States of America

**Partial Discharge Behaviours of different aged insulating liquids**

**L. Calcara1, M. Pompili1, E. Breda2, D. Di Barnaba2, D. Gasparini2, D. Rocconi2**

1Sapienza University of Roma, Italy; 2Terna Rete Italia

**Partial Discharge Characteristic Analysis in a 6.6 kV Cast Resin Voltage Transformer Using High-Frequency Distributed Constant Equivalent Circuits**

**R. Koresawa1, M. Kozako1, M. Hikita1, Y. Aoki2, K. Iida2, T. Umemura2, D. Ito3, K. Oyama3, T. Nakamae3, T. Maeda3, T. Ozaki3**

1Kyushu Institute of Technology, Japan; 2Mie University; 3Toshiba Industrial Products and Systems Co, Ltd.

**ACCELERATED THERMAL AGING EFFECT ON THE NEW AND RECLAMATION TRANSFORMER OIL BEHAVIOR**

**F. Guerbas**

University of sciences and technology HOUARI BOUMEDIENE USTHB, Algeria

**Study of Peak Point Detection Voltages in Smart Grid Using AMPD Technique**

**A. Ahmed1, W. Ali Shah1,2, S. Ur Rehman3, M. Farhan4, M. Shah5, S. Shah6**

1Effat University, Saudi Arabia; 2Department of Electrical Engineering, Namal University Mianwali, Pakistan; 3Department of Electrical Engineering, Namal University Mianwali, Pakistan; 4Namal University Mianwali, Pakistan; 5Department of Cyber Security, FAST NUCES Islamabad, Pakistan; 6Parsons Overseas Limited Dubai, United Arab Emirates

**Temperature Distribution in GIS Cable Terminal Subjected to Cold Conditions**

**P. Song1, L. Li1, S. Li1, Y. Yu1, R. Song1, L. Meng1, Q. Tang1, S. Liu2,3, Y. Wang3, J. Li3**

1State Grid Tianjin Electric Power Research Institute; 2State Grid Tianjin Electric Company; 3Tianjin University

**Effect of Magnetic Field on Partial Discharge Behavior of Composite Insulation for Cryogenic Applications**

**N. Guvvala, P. Cheetham, C. H Kim, S. Pamidi**

Center for Advanced Power Systems and FAMU-FSU College of Engineering, Tallahassee, Florida 32310, United States of America

**Simulation of TEV and RFI Detection Sensitivity along an MV Switchgear Busbar Compartment**

**M. Miljanovic1, M. Kearns2, B. G Stewart1**

1University of Strathclyde, United Kingdom; 2EDF Energy, East Kilbride, Scotland, UK

**Electrospinning with non-DC voltages**

**R. Cselko, L. Szekely, R. A. Pozman**

Budapest University of Technology and Economics, Hungary

**A study on the use of zinc oxide micro-varistor based field grading materials for composite line insulators**

**F. Keskin Arabul1,2, A. Y. Arabul1,2, E. A. Cherney1, S. H. Jayaram1**

1Electrical and Computer Engineering, University of Waterloo, Waterloo, ON, Canada; 2Department of Electrical Engineering, Yildiz Technical University, Istanbul, Turkey

**Proposal for Evaluation of Insulation Performance by Partial Discharge Characteristics of Resin Substrates Containing Micro-Sized Multiple Voids**

**D. Okumura, K. Hamasuna, T. Okamoto, M. Kozako, M. Hikita**

Kyushu Institute of technology, Japan

**PD Measuring of Additive Manufactured Component with a Defined Cavity**

**M. Kahn, L. Tiedemann, M. Kurrat**

TU Braunschweig, Germany

**Partial discharges and AC breakdown voltage tests on thick metalized Aluminum Nitride substrates for high voltage power modules**

**J. Deltour1, M.-L. Locatelli1, S. Dinculescu1, D. Malec1, D. Meyer2**

1Laplace, Université de Toulouse, UPS, INPT, CNRS; 2CeramTec GmbH, CeramTec-Platz 1–9 73207 Plochingen, Germany

**Performance Analysis of Double Arrester Protection Configuration of Pole Mounted Transformers using Probabilistic Risk Evaluation**

**N. P. Koalana, P. N. Bokoro**

University of Johannesburg

**A Study on the Ability of Different Non-Intrusive Sensors for Diagnosing Outdoor Insulator Defects**

**C. F. Kumru1,2, A. Lutfi1, A. El-Hag1, A. Darwish3, S. S. Refaat4, H. Abu-Rub4**

1University of Waterloo, Canada; 2Suleyman Demirel University, Türkiye; 3Purdue University, USA; 4Texas A&M University, Qatar

**Estimation of UHF Current of Partial Discharges Occurring in Propulsion Coils of Superconducting Maglev Systems Using an On-Board Radio Interferometer System with a Vector-Antenna**

**M. Kawada**

Tokushima University, Japan

**TT - 01: Testing Technologies**

*Time:*Monday, 19/June/2023: 3:00pm - 5:00pm  ·  *Location:*2101  
*Session Chair:*Giuseppe Stanciulescu

Maximum number of presentations for this session: 6

**3:00pm - 3:20pm**

**Breakdown at medium frequencies of thermally-aged polyester films.**

**J. Villibor2, C. Zheng3, C. Leth Bak3, S. V. Suraci1, A. Rumi1, A. Cavallini1**

1University of Bologna, Italy; 2Universidade Federal de Itajubá, Brazil; 3University of Aalborg, Denmark

**3:20pm - 3:40pm**

**Electrical Insulation Testing for Superconducting Magnets’ Qualification, Manufacturing FAT, SAT and assembly**

**E. H. R. Gaxiola**

ITER Organization, France

**3:40pm - 4:00pm**

**Partial Discharge Assessment Of Connectors Using Optical Probe**

**G. GABORIT1,2, E. FOND3, H. BOUHRIZ3, G. CHEVRIER-GROS1, L. DUVILLARET1**

1KAPTEOS S.A.S., 354 Voie Magellan, Bât. Cleanspace, 73 800 Ste Hélène du Lac, France; 2Laboratoire IMEP-LAHC, Université Savoie Mont Blanc, 73376 Le bourget du Lac cedex, France; 3RADIALL, 642 Rue Emile Romanet, 38340 Voreppe, France

**4:00pm - 4:20pm**

**Continuous, Inline Testing of Magnet Wire Products: Advantages and Considerations**

**D. Carroll1, B. Carroll1, N. Frost2**

1The Clinton Instrument Company, Unites States of America; 2Frosty's Zap Lab, LLC, United States of America

**4:20pm - 4:40pm**

**Metrics for Anomalous Charging Currents in Polymer Tantalum Capacitors**

**A. Teverovsky**

Jacobs, United States of America

**4:40pm - 5:00pm**

**Study on non-contact antenna based partial discharge measurements**

**G. D. P. Mahidhar, H. Edin**

KTH, Sweden

**TR - 01: Transformers No. 1**

*Time:*Monday, 19/June/2023: 3:00pm - 5:00pm  ·  *Location:*2104 A&B  
*Session Chair:*Hugh Zhu

Maximum number of presentations for this session: 6

**3:00pm - 3:20pm**

**Case study: Transformer failure detected with real time DGA monitoring**

**S. Leivo1, D. Sattler2, M. Duval3, C. Chiarella2**

1Vaisala Oyj, Finland; 2CTM Salto Grande, Uruguay; 3Hydro Quebec, Canada

**3:20pm - 3:40pm**

**Towards Intrusive Non-Destructive Online Ageing Detection of Transformer Oil Leveraging Bootstrap Machine Learning Models**

**U. A. Elele1, A. Nekahi1, A. Arshad1, I. Fofana2, K. McAulay1**

1Glasgow Caledonian University, United Kingdom; 2Université du Québec à Chicoutimi, Canada

**3:40pm - 4:00pm**

**Investigation of temperature effects on the ageing of paper-oil insulation under repetitive transient voltages**

**A. Y. Arabul1,2, F. Keskin Arabul1,2, S. H. Jayaram1**

1Electrical and Computer Engineering, University of Waterloo, Waterloo, ON, Canada; 2Department of Electrical Engineering, Yildiz Technical University, Istanbul, Turkey

**4:00pm - 4:20pm**

**The use of TEV sensors for online PD detection in oil-filled transformers**

**M. Lachance1, M. Al-Gunaid2**

1OMICRON electronics Canada; 2OMICRON Energy Solutions

**4:20pm - 4:40pm**

**Broadband Frequency Domain Dielectric Spectroscopy of Cellulose Insulation Material in Transformer**

**S. Wang, F. Lin, H. Li**

Huazhong University of Science & Technology, China, People's Republic of

**4:40pm - 5:00pm**

**Step-up transformers for intermittent renewable sources: natural ester fluid helping to surpass the challenges of this application**

**R. da Silva**

Cargill, US

**PD - S1: Partial Discharge**

*Time:*Tuesday, 20/June/2023: 10:00am - 12:00pm  ·  *Location:*2101  
*Session Chair:*Chanyeop Park

Maximum number of presentations for this session: 6

**10:00am - 10:20am**

**Electret Based Partial Discharge Mitigation in High Switching Frequency PWM Voltage Systems**

**F. Haque1, C. Park2**

1Sweet Briar College, United States of America; 2University of Wisconsin-Milwaukee

**10:20am - 10:40am**

**IEC60270 calibration uncertainty in gas-insulated substations**

**C. Mier1, A. Rodrigo2**

1Delft University of Technology; 2Universitat Politècnica de València

**10:40am - 11:00am**

**Formation of Degradation Layer on Silicone Rubber Used for Insulators**

**M. T. Khaing1, K. Yoshimura1, T. Sakoda1, S. Goto2, T. Anjiki2, T. Chiba2, Y. Kasuga2**

1University of Miyazaki, Japan; 2Toshiba Energy Systems & Solutions Corporation

**11:00am - 11:20am**

**Experience with Partial Discharge Tests on New Isolated Phase Bus**

**M. Partyka, T. Black**

Manitoba Hydro, Canada

**11:20am - 11:40am**

**Effects of Droplet Size and Dispersion Homogeneity on the Dielectric Integrity of Liquid Metal Polymer Composites**

**R. E. Calabrese1, E. Bury2, R. B. Green1, A. Koh2, C. Park3**

1Mississippi State University, United States of America; 2The University of Alabama, United States of America; 3University of Wisconsin - Milwaukee, United States of America

**11:40am - 12:00pm**

**Measurement of Radiated Power of Partial Discharges Occurring in Propulsion Coils of Superconducting Maglev Systems Using an On-Board Radio Interferometer System with a Vector-Antenna**

**M. Kawada**

Tokushima University, Japan

**RM - S2: Rotating Machines - No. 2**

*Time:*Tuesday, 20/June/2023: 10:00am - 12:00pm  ·  *Location:*2104 A&B  
*Session Chair:*Mike Williams

Maximum number of presentations for this session: 6

**10:00am - 10:20am**

**Analysis of Partial Discharge Behavior within a Spherical Cavity in a High Voltage Form-Wound Stator Coil**

**F. R. Silva1, R. S. Ferreira2, F. G. d. R. Martins3, D. H. N. Dias4**

1Fluminense Federal University (UFF); 2Rio de Janeiro Federal University (UFRJ); 3Fluminense Federal University (UFF); 4Fluminense Federal University (UFF)

**10:20am - 10:40am**

**Analysis of Partial Discharge Activity for Multi-Stress Accelerated Aged Stator Bars**

**B. Singh1, F. Mauseth2, E. Eberg3, E. Kantar4**

1Department of Electric Energy, NTNU, Norway; 2Department of Electric Energy, NTNU, Norway; 3SINTEF Energy Research, Norway; 4SINTEF Energy Research, Norway

**10:40am - 11:00am**

**Statistical Review of Voltage Endurance Test of Insulation for High Voltage Rotating Machines Stator Windings with Combined Standard and Accelerated Tests. “Three Step Test” TST**

**A. Gegenava, A. Khazanov**

National Electric Coil, United States of America

**11:00am - 11:20am**

**Challenges and opportunities in RPDIV testing after electrical machines assembly**

**E. Concettoni2, S. Luna2, F. Rosignoli2, A. Rumi1, A. Cavallini1**

1University of Bologna, Italy; 2Loccioni, Italy

**11:20am - 11:40am**

**Using Partial Discharge Measurements for implementing Reliability centered Maintenance**

**C. Hudon, R. Taghizad, G. Gosselin, C. Durochat**

DMI Energy, Canada

**11:40am - 12:00pm**

**Step Increased Voltage Endurance Test as a Tool for Evaluation of Life Expectancy for Stator Winding Ground Wall Insulation High Voltage Rotating Machines Steps Electrical Aging**

**A. Khazanov, A. Gegenava**

National Electric Coil, United States of America

**PS-02: Poster Session 2**

*Time:*Tuesday, 20/June/2023: 1:30pm - 3:00pm  ·  *Location:*2000C

**High Impregnability of Film Backed Mica Tape Made of Uncalcined Muscovite Mica Paper Containing Glass Chops**

**D. Yoshioka1, S. Mukasa1, Y. Tsukamoto2, Z. Timoranský3**

1Nippon Rika Technologies Inc., Tochigi, Japan; 2Nippon Rika Technologies Inc., Nihonmatsu, Japan; 3Nippon Rika Industries Corporation, Branch Office Austria, Vienna, Austria

**Hydrogenerators’ Vulnerability Towards Bearing Insulation Systems, Shaft Voltage and Current**

**J. Pedneault-Desroches1, A. Merkhouf1, K. Al-Haddad2**

1Hydro-Québec, Canada; 2École de technologie supérieure (ÉTS), Canada

**Practical installation and commissioning of a rotating machine partial discharge monitoring system**

**M. Huzmezan, C. Gurbuz**

Power Diagnositx Systems GmbH, Germany

**PD Electromagnetic RadiationCharacteristics by using Inter-Turn Insulation Sample of Inverter-fed Motor**

**M. shijin, P. Wang, C. z. Cheng, W. d. Huang**

si chuan university, China, People's Republic of

**On the Gassing Behaviour of Synthetic Ester Under Arching Faults**

**M. AGOUASSI1,2, U. MOHAN1,2, Y. HADJADJ3, I. FOFANA1,2**

1Research Chair on the Aging of Power Network Infrastructure (ViAHT); 2Université du Québec à Chicoutimi; 3Conseil National de Recherches Canada (CNRC)

**Risk Assessment and Mitigation Strategy of 120 lightly loaded Power Transformers Containing Dibenzyl Disulphide**

**J. Malan, R. Zahrani, H. Rowais**

Saudi Aramco, Saudi Arabia

**Temperature Impacts on On-Load Tap Changers Vibroacoustic Signals**

**J. P. da Costa Souza1, P. Picher2, M. Gauvin2, H. Ezzaidi1, I. Fofana1, U. M. Rao1, F. Dabaghi-Zarandi1**

1Université du Québec à Chicoutimi - UQAC, Canada; 22Institut de recherche d'Hydro-Québec, Canada

**Correlation between the Optical Properties and the Degree of Polymerisation of Transformer Insulation Paper**

**N. Seifaddini1, S. Bekibenan1, F. Meghnefi1, K. S. Lim2, O. C. WENG2, W. Udos2, U. M. Rao1, I. Fofana1, A. Chehri1, M. Ouhrouche1**

1University of Quebec at Chicoutimi, Canada; 2Photonics Research Centre, University of Malaya, Malaysia

**Preliminary studies on Improving the Properties of Canola Oil by Addition of Methyl Ester from a Saturated Vegetable Oil**

**S. O. OPARANTI, K. Lucia Yapi, U. M. RAO, I. FOFANA**

Université du Québec à Chicoutimi, Canada

**New insulation materials - testing and trends for HV applications**

**R. Platek, R. Sekula**

Hitachi Energy, Poland

**Effect of Nano particles in improvement of dielectric characteristics of liquid insulation**

**S. C1, R. N. h. N1, F. A. K. Khan2**

1RV College of Engineering, Bangalore, India; 2Ghousia Colege of Engineering Ramanagara, Bangalore,India

**Modelling of Electric Field Distributions on Cable Termination Defects under DC Plus Ripples**

**S. Shahtaj, F. Fan, B. G. Stewart**

Institute for Energy and Environment, University of Strathclyde, United Kingdom

**Mechanical Stress Distribution in Epoxy Encapsulation of 500kV Prefabricated HVDC Cable Joint under Extreme Cold Weather**

**W. Yang1, L. Yin1, J. Qiao1, C. Zhang1, Z. Li2, Y. Lu3, Y. Gao3, K. Wang1, S. Liu4, J. Li4**

1Beijing Institute of Smart Energy; 2State Grid Corporation of China; 3State Grid Jibei Electric Power Research Institute; 4Tianjin University

**Harmonic resonance overvoltage analysis in a mixed overhead and underground cable line in transmission systems**

**C. T. Pham1, T. Pham1, Q. D. Nguyen2, T. V. Tran1**

1Hanoi University of Science and Technology, Hanoi, Vietnam; 2Nha Trang University, Nha Trang, Vietnam

**Diagnostics of non-ceramic insulators with inhomogeneous field arrangement and wetting with different liquids**

**R. Cselko, L. Szekely, D. Balogh, P. I. Salánki**

Budapest University of Technology and Economics, Hungary

**Pulsed Techniques for Accelerated Electrical Aging of Solid Insulation Materials and Components of HV Power Supplies**

**A. Pokryvailo**

Spellman High Voltage Electronics Corp., United States of America

**Innovative Numerical Method for the Determination of the Corona Onset Gradient on HVDC Overhead Transmission Lines**

**P. Huber, F. Jenau**

TU Dortmund, Germany

**Digital Image Processing Applied to the Reduction of Subjectivity on Ultraviolet Imaging Diagnosis of Insulators**

**G. A. Rodrigues1, B. V. S. Araujo1, G. V. R. Xavier1, C. A. Cordeiro2, E. O. Freire1, T. V. Ferreira1**

1Federal University of Sergipe, Brazil; 2Eneva S.A.

**Study on the Electrical Tree Propagation Evolution in Polymer Composites via Phase Field Method**

**L. Han, Y. Zhu, Q. Li, J. He**

State Key Laboratory of Power System, Department of Electrical Engineering, Tsinghua University, China

**Laminated busbar PDIV improvement using a new varnish based insulation technology with micro/nano fillers**

**O. A. I. RAHMOUNI1,2, S. AIT AMAR2, S. DUCHESNE2, J.-F. WECXSTEEN1**

1Amphenol Auxel, France; 2Univ. Artois, UR 4025, Laboratoire Systèmes Electrotechniques et Environnement (LSEE), F-62400 Béthune, France

**Structural Strength of PTFE Insulating Nozzles in Circuit Breakers**

**A. Sokolov, J. Korbel, S. Kotilainen**

Hitachi Energy Switzerland Ltd.

**Prevention of Space Charge Accumulation and Space Charge Induced Breakdown Using Electrets**

**P. C. Saha, O. Faruqe, C. Park**

University of Wisconsin-Milwaukee, United States of America

**PD Detection and Monitoring of High Voltage Cabling in an Aerospace Environment Using a UHF Radio Sensing System**

**M. Kawada**

Tokushima University, Japan

**TR - 02: Transformers No. 2**

*Time:*Tuesday, 20/June/2023: 3:00pm - 5:00pm  ·  *Location:*2101  
*Session Chair:*Solomon Chiang

Maximum number of presentations for this session: 6

**3:00pm - 3:20pm**

**Insulation Residual Life Estimation Based on Transformer Condition Assessment Data**

**A. Sbravati, G. Frimpong, L. Cheim**

Hitachi Energy, United States of America

**3:20pm - 3:40pm**

**Enhanced Surface Insulation Strength of Modified Polyimide Under High-Frequency Electric Stress by Fabricating the Al2O3/PI Composite Coating**

**Z. Li1, Q. Li1, Y. Han1, Z. Xie1, H. Ren1, H. Gao1, Z. Wang2**

1North China Electric Power University, Beijing, China; 2University of Exeter,Exeter, UK

**3:40pm - 4:00pm**

**Case study to manage the rising dissolved gases trends in oil filled transformers**

**A. Vispute**

OQ Oman, Oman

**4:00pm - 4:20pm**

**Experimental Study of Sealed Tube Accelerated Aging Test Parameters and Determination of the Thermal Class of Transformerboard**

**B. Greaves1, A. Levin1, T. Prevost1, K. Biggie1, L. Dreier2, D. Tschudi2**

1Weidmann Electrical Technology Inc., United States of America; 2Weidmann Electrical Technology AG., Switzerland

**4:20pm - 4:40pm**

**A new Approach for AI-based DGA for Transformers and Tap Changers**

**A. Alber (Pollok), R. Frotscher, M. Foata, M. Dolles**

Maschinenfabrik Reinhausen, Germany

**4:40pm - 5:00pm**

**Comparative Analysis of Lightning Properties of Selected GTL based Dielectric Liquids under Positive Lightning Impulse**

**F. Stuchala, P. Rozga**

Lodz University of Technology, Poland

**NM/FA- S1: New Materials /Failure Analysis**

*Time:*Tuesday, 20/June/2023: 3:00pm - 5:00pm  ·  *Location:*2104 A&B  
*Session Chair:*Anna Gegenava

**3:00pm - 3:17pm**

**Film Capacitor Degradation under Electrical and Thermal Stresses Based on Capacitance Loss**

**Z. Li, H. Li, T. Qiu, F. Lin, G. Zhang, Q. Zhang**

State Key Laboratory of Advanced Electromagnetic Engineering and Technology, Huazhong University of Science and Technology, China

**3:17pm - 3:34pm**

**Feasibility of Micro-Multilayer Multifunctional Electrical Insulation (MMEI) System for High Voltage Applications**

**E.-S.E. Shin**

Universities Space Research Association (USRA), United States of America

**3:34pm - 3:51pm**

**Comparative effect of hybrid and thermally upgraded kraft insulating papers on degradation of mineral and natural ester insulating oils by accelerated ageing tests**

**H. M. WILHELM1, P. FERNANDES1, K. MOSCON1, M. FORNARI1, S. PERES1, V. BENDER2, T. MARCHESAN2, M. A. MARIN3, G. MORAES3, N. VELOSO3**

1VEGOOR Tecnologia Aplicada - VEGOOR; 2Universidade Federal de Santa Maria - UFSM; 3Companhia Paranaense de Energia – COPEL

**3:51pm - 4:08pm**

**Study on the dynamic process and extinguishing criterion of metallized film self-healing arc**

**G. Zhang, H. Li, J. Lan, H. Li, Z. Li, F. Lin, Q. Zhang**

Huazhong University of Science and Technology, China, People's Republic of

**4:08pm - 4:25pm**

**Formulation, curing kinetics and dielectric properties of photocurable epoxy resins for insulation applications**

**S. Zhong, D. Armstrong, M. Hetrich, J. Kadoko**

ABB Electrification Research Center, United States of America

**4:25pm - 4:42pm**

**CFD simulation of the flow reversal transient in a high voltage circuit breaker**

**M. T. Dhotre1, M. Seeger2**

1Hitachi Energy, Switzerland; 2Hitachi Energy Research, Switzerland

**4:42pm - 5:00pm**

**Review and Perspective of Using Nanocomposites in High-Voltage Insulation of High Voltage Rotating Machines (HVRM)**

**A. Nikolaev, A. Khazanov, A. Gegenava**

National Electric Coil, United States of America