

Date: Sunday, 19/June/2022

8:00am - 12:00pm	Short Course 1: Fundamentals of Dielectric Materials and Testing Location: Wiley Room Session Chair: Inna Kremza Presented By: Dr. Nancy Frost
Wiley Room	
8:00am - 12:00pm	Short Course 2: Dissolved Gas Analysis (DGA) for in-depth condition assessments. The scientific perspective Location: Milani Room Session Chair: Inna Kremza Presented By: Mr. Lars Arvidsson General Manager VPdiagnose
Milani Room	
1:00pm - 5:00pm	Short Course 3: Longevity and Reliability of Energy Cable Systems in the Grid Location: Wiley Room Session Chair: Inna Kremza Presented By: Dr. Nigel Hampton Nigel.Hampton@ul.com UL Laboratories
Wiley Room	
1:00pm - 5:00pm	Tutorial: Electrical Insulation Overview Location: Milani Room Session Chair: Inna Kremza National Electrical Manufacturers Association – Industrial Systems The instructors are experts in their fields and collectively have over 100 years of industry experience: William Lee, Application Development Engineer – Electrical Tapes & Liquid Resins 3M Electrical Markets Division Evanne Wang, Applications Development Engineer, DuPont Mark Winkeler, Manager Application Technology, ELANTAS PDG, Inc. Solomon Chiang, Director of R&D, The Gund Company
Milani Room	
3:00pm - 6:30pm	REGISTRATION: IPMHVC and EIC 2022 Registration Process Location: ROTONDA Session Chair: Liz Tillotson Session Chair: Nancy Frost Authors' and attendees' registration Badge
ROTONDA	

Date: Monday, 20/June/2022

8:30am - 9:30am	PLS-01: Plenary Session 1 "Recent advances in RF multipactor and breakdown" Location: Ballroom E&F IPMHVC Plenary Session Presenter: John Verboncoeur
Ballroom E&F	
10:00am - 12:00pm	C&A - S1: Cable & Accessories Session 1 Location: Meeting Room 301-A Session Chair: Gian Carlo Montanari Cables & Accessories Oral Session 01
Meeting Room 301-A	
10:00am - 12:00pm	RM - S1: Rotating Machines Session 1 Location: Ballroom G Session Chair: Greg Stone Rotating Machines Oral Session 01
Ballroom G	
1:30pm - 3:00pm	PS-01 EIC: Poster Session 1 - EIC Location: Ballroom D Session Chair: Joseph Williams Posters
Ballroom D	
3:30pm - 5:30pm	NM - S1: New Materials Session 1 Location: Meeting Room 301-A Session Chair: Maryann Lander
Meeting Room 301-A	
3:30pm - 5:30pm	PD - S1: Partial Discharge Session 1 Location: Ballroom G Session Chair: Mihai Huzmezan
Ballroom G	

Date: Tuesday, 21/June/2022

8:30am - 9:30am	PLS-02: Plenary Session 2: 2022 IEEE DEIS Dakin Distinguished Technical Contributions Award Location: Ballroom E&F Professor Keith Nelson Selected as the winner of the 2022 IEEE DEIS Thomas Dakin Distinguished Technical Contributions Award
Ballroom E&F	
10:00am - 12:00pm	TT - 01: Testing Technologies Session 1 Location: Meeting Room 301-A Session Chair: Jim Guo
Meeting Room 301-A	
10:00am - 12:00pm	TR - 01: Transformers Session 1 Location: Ballroom G Session Chair: Alan Sbravati
Ballroom G	
1:30pm - 3:00pm	PS-02: Poster Session 2 - EIC Location: Ballroom D Session Chair: Alan Sbravati
Ballroom D	
3:30pm - 5:30pm	

Meeting Room 301-A	FA - 01: Failure Analysis Session 1 Location: Meeting Room 301-A Session Chair: Aleksandr Khazanov
3:30pm - 5:30pm	RM - S2: Rotating Machines Session 2 Location: Ballroom G Session Chair: Reza Soltani Rotating Machines Oral Session 02
Ballroom G	
Date: Wednesday, 22/June/2022	
8:30am - 9:30am	PLS-03: Expert Panel: "Present and future of liquid insulation technology" Location: Ballroom E&F Session Chair: Inna Kremza
Ballroom E&F	
10:00am - 12:00pm	SG_OI - 01: Switchgear and Outdoor Insulation - Session 1 Location: Meeting Room 301-A Session Chair: Mark Winkeler
Meeting Room 301-A	
10:00am - 12:00pm	TR - 02: Transformers Session 2 Location: Ballroom G Session Chair: Diego Robalino
Ballroom G	
1:30pm - 3:10pm	TT - 02: Testing Technologies Session 2 Location: Meeting Room 301-A Session Chair: Aleksei Nikolaev
Meeting Room 301-A	
1:30pm - 3:10pm	RM - S3: Rotating Machines - S3 Location: Ballroom G Session Chair: Anna Gegenava
Ballroom G	

Presentations

C&A - S1: Cable & Accessories Session 1

Time: Monday, 20/June/2022: 10:00am - 12:00pm · *Location:* Meeting Room 301-A
Session Chair: Gian Carlo Montanari

10:00am - 10:20am

Comparison of Different Voltage Waveforms for Partial Discharge Measurement in Medium Voltage Cables and Accessories

A. Naderian Jahromi¹, P. Ketharam Pattabi¹, S. Lo¹, J. Densley^{1,2}
¹METSCO Energy Solutions, Canada; ²Arbolec Solutions, Canada

10:20am - 10:40am

Effect of Semiconducting Layer on Cable Insulation Damage Detection Using Surface Wave Reflectometry

A. S. Arman¹, S. W. Glass III², L. S. Fifield², M. Ali¹
¹University of South Carolina, Columbia, SC, USA; ²Pacific Northwest National Laboratory, Richland, WA, USA

10:40am - 11:00am

Dielectric Fluid Based Electrical Insulation System for Electric Transport Applications

P. Mensah^{1,2}, P. Cheetham^{1,2}, C. Kim², S. Pamidi^{1,2}
¹FAMU-FSU College of Engineering, Tallahassee, USA; ²Center for Advanced Power Systems, Florida State University

11:00am - 11:20am

Electrothermal aging of DC cables and insulation electrical properties: conductivity, space charge and partial discharges

P. Seri¹, G. C. Montanari², M. Albertini³, S. Franchi Bononi³
¹University of Bologna, Italy; ²Florida State University, USA; ³Prismian Group, Italy

11:20am - 11:40am

Silicone Injection of Cables with Poly-isobutylene Based Water-blocked Conductor

J. Steele¹, W. J Chatterton¹, J. Smith. III², W. Ford¹, N. Laurie¹
¹Novinium, United States of America; ²Smith Cable Consulting

11:40am - 12:00pm

Understanding the risks created by dynamic loading and temperature changes in DC cables through field distribution transients

H. McDonald, S. Rowland

The University of Manchester, United Kingdom

RM - S1: Rotating Machines Session 1

Time: Monday, 20/June/2022: 10:00am - 12:00pm · Location: Ballroom G

Session Chair: Greg Stone

10:00am - 10:20am

Update on IEEE PES EMC Materials Subcommittee Activities

N. Frost

Frosty's Zap Lab, LLC, United States of America

10:20am - 10:40am

Machine Learning for Electric Machine Prognostics with Basic Motor Data

H. W Penrose

MotorDoc LLC, United States of America

10:40am - 11:00am

Comparative Study of Phase Resolved Partial Discharge Patterns obtained with Different Instruments on Individual Stator Bars and Coils

M. Lévesque, Y. D. Seol, C. Hudon, H. Provencher

Hydro-Québec, Canada

11:00am - 11:20am

Experiences of FRA measurements on Medium Voltage Rotating Machines

H. Mayora¹, R. Álvarez¹, G. Bossio², E. Calo¹, L. Catalano¹

¹IITREE-LAT, FI-UNLP; ²GEA-IITEMA, UNRC - CONICET

11:20am - 11:40am

Testing Partial Discharges in Laminated Busbar for Electrified Transportation: an Innovative Approach

G. C. Montanari¹, Q. Yang¹, D. Nath¹, P. Defriece², J. P. Schmeller²

¹Florida State University, FL, United States of America; ²NSWC, Philadelphia, USA

11:40am - 12:00pm

Megger Insulation

A. Toribio

Megger, United States of America

PS-01 EIC: Poster Session 1 - EIC

Time: Monday, 20/June/2022: 1:30pm - 3:00pm · Location: Ballroom D
Session Chair: Joseph Williams

Analysis of the Application of Aramid Paper in the Magnetic Pole of Hydro-generator

J. Zhang¹, Y. Wang², Y. Sun¹, R. Tropeano³, N. Frost⁴

¹Yantai Metastar Special Paper Co., Ltd., China; ²Harbin Electric Machinery Co., Ltd., China; ³Windsor-Stevens, United States of America; ⁴Frosty's Zap Lab, LLC, United States of America

Effect of inhomogeneities in epoxy-glass-mica composites on conductive channel formation

P. Kadlec, O. Musil, V. Nikolić, R. Polanský

University of West Bohemia, Czech Republic

The effect of x-ray radiation dose on the performance of power cable insulation materials

w. wang

North China electric power university, China, People's Republic of

A new fault location device for high-voltage single-core cable based on distributed distance measurement method

H. Li, Y. He, Y. Cao, W. Sun, Z. Wang, F. Yang, Q. Yan

State Grid Shanghai Cable Company, China, People's Republic of

Aging data supporting network usage tariff calculation

R. Cselko, B. Nemeth, G. Kálecz, D. Szabo

Budapest University of Technology and Economics, Hungary

Dielectric and thermal properties of self-healing carboxylated nitrile rubber ionically crosslinked with zinc oxide

V. Nikolić¹, P. Kadlec¹, R. Polanský¹, S. Utrera-Barrios², M. Hernández Santana²

¹University of West Bohemia, Faculty of Electrical Engineering, Pilsen, Czech Republic; ²Polymer Composite Group, Institute of Polymer Science and Technology (ICTP-CSIC), Madrid, Spain

Calibration method of dielectric loss measuring instrument for power cable under 0.1Hz AC voltage

w. wang, w. wang

North China electric power university, China, People's Republic of

Research on Cable Aging Diagnosis Based on Short Circuit Response

K. Zhao, M. Sun, L. Gong, H. Wang, W. Wang

North China Electric Power University, China, People's Republic of

Condition Management of Low-Voltage Distribution Cables

R. Cselko, D. Balogh, G. Kálecz, B. Nemeth, B. Hartmann

Budapest University of Technology and Economics, Hungary

Effect of moisture on the breakdown performance of XLPE insulation: A first-principles study

J. Liu¹, M. Hu^{1,2}, W. Wang¹

¹North China Electric Power University, China, People's Republic of; ²State Grid Huaian Power Supply Company, China, People's Republic of

Location of Cable Joint with Moisture Based on Short-circuit Response

L. Gong, C. Du, K. Zhao, S. Zhao, W. Wang

North China Electric Power University, China, People's Republic of

PRE-QUALIFICATION TEST ON EHV CABLE SYSTEMS WITH WIRELESS ARCHITECTURE FOR TEMPERATURE MONITORING

N. AL QAHTANI¹, N. R. BURJUPATI²

¹GCC ELECTRICAL TESTING LABORATORY, DAMMAM, SAUDI ARABIA; ²Consultant, GCCETL, Former Addl Director, Central Power research Institute, India

Partial Discharge Monitoring and Diagnosis Utilizing Power Line Communication in a Simulated Substation

A. Houdai¹, R. Koresawa¹, T. Wakisaka¹, M. Kozako¹, M. Hikita¹, H. Sato², M. Soeda²

¹Kyushu Institute of Technology, Japan; ²Kyushu Electric Power Co., Inc, Japan

Optical Detection Technology of Partial Discharge Based on Fluorescent Glass

C. Li¹, M. Ren¹, H. Guan¹, R. Chen¹, L. Zhang², J. Peng², J. Liu², X. Guo²

¹State Key Laboratory of Electrical Insulation and Power Equipment Xi'an Jiaotong University Xi'an, China; ²China Railway Signal & Communication Metro-Transportation Control Technology Co, LTD Changsha, China

Fault Diagnosis of Vacuum Circuit Breaker with Permanent Magnetic Mechanism Based on Multi-physical Measurements

R. Chen¹, M. Ren¹, H. Zhang¹, C. Xia¹, L. Zhang², J. Peng², J. Liu², X. Guo²

¹Xi'an Jiaotong University, Xi'an, China; ²China Railway Signal & Communication Metro-Transportation Control Technology Co, LTD, Changsha, China

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

Distribution characteristics of slightly uneven electric field in oil of oil-pressboard insulation structure under DC voltage

K. He¹, H. Zhou², C. Gao², B. Qi²

¹State Grid Economic and Technological Institute co., ltd; ²North China Electric Power University, China, People's Republic of

Research on the characteristics of space electric field in the oil of large-scale oil-pressboard insulation under AC and DC voltages

J. Wu¹, F. Su², L. Li¹, C. Gao², B. Qi², C. Li²

¹State Grid Economic and Technological Institute Co., Ltd; ²North China Electric Power University, China, People's Republic of

Partial Discharge Detection of Aviation Cables under Low Pressure

Z. Li, Z.-b. Shen, J. JIANG, C.-h. Zhang

Nanjing University of Aeronautics and Astronautics, China, People's Republic of

The location method of insulation weak point of inverter-fed motor for electric vehicles

S. Ma, P. Wang, H. Guo, C. Cheng, S. Akram

College of Electrical Engineering and Information Technology Sichuan University Chengdu, China

NM - S1: New Materials Session 1

Time: Monday, 20/June/2022: 3:30pm - 5:30pm · Location: Meeting Room 301-A
Session Chair: Maryann Lander

3:30pm - 3:50pm

Experimental Comparative Investigation on Alternative and Commercially Available Wire Insulations Based on Partial Discharges Activity

H. Naderiallaf¹, P. Giangrande¹, M. Galea^{1,2}

¹Power Electronics, Machine and Control Group, University of Nottingham, The United Kingdom; ²Department of Industrial Electrical Power Conversion, The University of Malta

3:50pm - 4:10pm

Additive Manufactured Dielectrics for Aerospace Electrical Insulation Applications

C. M. Severns¹, S. Dinculescu¹, T. Lebey²

¹Universite de Toulouse III, Universite Paul Sabatier, Laboratoire Plasma et Conversion d'Energie, Fance; ²Safran Technology, Toulouse, France

4:10pm - 4:30pm

Process of Material Development for Unique Electrical Applications

C. Klein¹, M. Wantuch¹, N. Frost²

¹Astro Chemical, United States of America; ²Frosty's Zap Lab, LLC, United States of America

4:30pm - 4:50pm

Fabrication and Characterization of Electrical Insulation System Components Using SLA and FDM Based Additive Manufacturing

E. Manzo^{1,2}, N. Downey^{1,2}, P. Cheetham^{1,2}, C. H. Kim², S. Pamidi^{1,2}

¹FAMU-FSU College of Engineering; ²Florida State University's Center for Advanced Power Systems

4:50pm - 5:10pm

Dielectric Failure of Hydrofluoroolefine HFO1234ze in the Presence of Water Impurity

X. Hu, X. Yu, H. Hou, B. Wang

Wuhan University, China, People's Republic of

5:10pm - 5:30pm

Green chemistries for use as electrical insulation

B. Chambers¹, N. Frost²

¹Star Technology, United States of America; ²Frosty's Zap Lab, LLC, United States of America

PD - S1: Partial Discharge Session 1

Time: Monday, 20/June/2022: 3:30pm - 5:30pm · Location: Ballroom G
Session Chair: Mihai Huzmezan

3:30pm - 3:50pm

A Review of the History of the Development of Partial Discharge Testing

G. Stone¹, **A. Cavallini**², **G. Behrmann**³

¹Stone Dielectrics, Canada; ²Univeristy of Balogna; ³Consultant

3:50pm - 4:10pm

Effect of Particle Geometry on Electric Field Distribution, Partial Discharge, and Dielectric Strength of Iron-Polymer Composites

R. E. Calabrese¹, **E. Bury**², **A. Koh**², **C. Park**¹

¹Mississippi State University, United States of America; ²University of Alabama, United States of America

4:10pm - 4:30pm

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

H. Jahangiri¹, **M. Kawada**²

¹aerospaceHV, United Kingdom; ²Tokushima University, Japan

4:30pm - 4:50pm

Investigation about the effect of the voltage profile on RPDIV and time to failure for insulation materials subjected to impulsive stress conditions

A. Caprara, **G. Ciotti**

Techimp - Altanova group Srl, Italy

4:50pm - 5:10pm

Comparison of Partial Discharge activity in Synthetic Ester and Synthetic Ester- based fullerene nanofluid under AC 50 Hz

H. KHELIFA¹, **S. ANAND**², **E. VAGNON**¹, **A. BEROUAL**¹

¹Univ Lyon, Ecole Centrale de Lyon, INSA Lyon, Université Lyon 1, CNRS, Ampère,UMR5005; ²Power Electronics & Converters/ Ampère CNRS SuperGrid Institute/ INSA Lyon, Villeurbanne, France

5:10pm - 5:30pm

Omicron Infomercial

M. Sze

Omicron, United States of America

TT - 01: Testing Technologies Session 1

Time: Tuesday, 21/June/2022: 10:00am - 12:00pm · Location: Meeting Room 301-A

Session Chair: Jim Guo

10:00am - 10:20am

Nondestructive 100 percent electrical strength test method for thermally conductive insulating foils

L. Reissenweber¹, **M. Scheler**¹, **S. Hetzel**¹, **T. Fischer**¹, **M. Rossner**¹, **A. Stadler**¹, **W. Pohl**², **T. Doering**²

¹Coburg University of Applied Sciences and Arts, Germany; ²HALA Contec GmbH & Co. KG, Germany

10:20am - 10:40am

Transformer Core-Vibration Analysis: Coupling Paths

A. Wuerde¹, **J. N. Kahlen**², **N. Langenberg**¹, **A. Moser**¹

¹IAEW at RWTH Aachen University, Germany; ²Fraunhofer Institute for Applied Information Technology FIT, Sankt Augustin, Germany

10:40am - 11:00am

Multiple Chopped Wave Test: Experience and Possible Future Test Improvement

T. Zupan¹, **I. Novko**¹, **I. Ziger**²

¹Končar – Electrical Engineering Institute Ltd., Croatia; ²Končar – Instrument Transformers Inc., Croatia

11:00am - 11:20am

Multilayer Electret Based Electric Field Neutralization under Pulse Width Modulated High Voltage Waveforms

F. Haque, **O. Faruqe**, **C. Park**

Mississippi State University, United States of America

11:20am - 11:40am

Effect of test parameters and statistical life data analysis of sinusoidal voltage endurance test on round magnet wires and insulating papers

R. G. Andrzejewski, **E. Spezia**, **W. d. L. Pires**

WEG Equipamentos Elétricos S.A., Brazil

11:40am - 12:00pm

Cable Rejuvenation 101 & a Detailed Case Study

W. J Chatterton

Novinium, United States of America

TR - 01: Transformers Session 1

Time: Tuesday, 21/June/2022: 10:00am - 12:00pm · *Location:* Ballroom G
Session Chair: Alan Sbravati

10:00am - 10:20am

Impacts on DER: Transformer and Cable Reliability

A. Ross¹, B. Lanz²

¹EPRA - Electric Power Reliability Alliance, United States of America; ²IMCorp

10:20am - 10:40am

Vegetable fluids: the reason of the new trend

F. SCATIGGIO, G. CAMPI

A&A FRATELLI PARODI

10:40am - 11:00am

Parameters Identification of the Electrical Debye Model for Power Transformers Multilayer Insulation Systems

G. Hernandez¹, A. Ramirez¹, D. Robalino²

¹VTC West, Mexico; ²Megger

11:00am - 11:20am

On-line Partial Discharge Monitoring of Substation Power Transformers

M. Huzmezan

Power Diagnostix Systems GmbH, Germany

11:20am - 11:40am

PD-localization in spatial distributed HV-windings

C. Staubach¹, C. Engelen², F. Oetti²

¹University of Applied Science Hannover, Germany; ²OMICRON electronics GmbH

11:40am - 12:00pm

Thermal behavior evaluation of a new solid insulating paper in natural ester and mineral insulating oils

H. WILHELM¹, P. FERNANDES¹, L. DILL¹, K. MOSCON¹, M. A. MARIN², T. MARCHESAN³, V. BENDER³, G. MORAES²

¹VEGOOR, Brazil; ²COPEL, Brazil; ³UFMS, Brazil

PS-02: Poster Session 2 - EIC

Time: Tuesday, 21/June/2022: 1:30pm - 3:00pm · Location: Ballroom D
Session Chair: Alan Sbravati

Interference of Stray Gases in the Diagnosis of Low-temperature Faults in Soybean-Based Natural Esters

M. Meira¹, R. Álvarez², C. Verucchi¹, L. Catalano²

¹INTELYMEC (UNCPBA) and CIFICEN (UNCPBA-CICPBA-CONICET), Olavarría, Argentine Republic; ²IITREE-LAT-FI-UNLP, La Plata, Argentine Republic

Investigation on the arrangement strategy of UHF detection antennas in power transformers

J. Du, J. Bi, S. Yuan, Y. Xu, J. Jiang

China Electric Power Research Institute

Analysis of a Gas Formation Fault in Converter Transformer Bushing

Q. Xie, R. Liu, Y. Feng, L. Chen, Z. Zhang

State Grid Sichuan Electric Power Research Institute, China, People's Republic of

Effect of Thermal Bubbles on Partial Discharge and Breakdown Characteristics of Oil-Immersed Pressboard

R. Zhang, Q. Zhang, J. Zhou, Z. Zhang, Y. Sun, S. Wang

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

Prediction Method for Online Monitoring Data of Dissolved Gas in Transformer Oil

J. Li, Y. Cheng

North China Electric Power University, China, People's Republic of

Partial discharge detection of cast resin transformers using high-frequency signal propagation characteristic analysis and application to diagnostic technology

R. Koresawa¹, M. Kozako¹, M. Hikita¹, Y. Aoki², K. Iida², T. Umemura², T. Nakamae³, T. Maeda³, T. Ozaki³, Y. Nakamura⁴

¹Kyushu Institute of Technology, Japan; ²Mie University; ³Toshiba Industrial Products and Systems Co, Ltd; ⁴Toshiba Infrastructure Systems & Solutions Corporation

Research and optimization measures on anti-short circuit electrodynamic force of amorphous alloy three-dimensional coil transformer

H. Zhan, Y. Luo, Y. Duan

North China Electric Power University, China, People's Republic of

Characteristic gas dissolution properties in ester insulating oil

Y. Xing, Q. Ma, Q. Li, M. Dong

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

Multi-spectral characteristics in partial discharge process of oil-paper insulated needle-plate electrode

Y. Liu, Y. Xing, Y. Hu, M. Dong, M. Ren, Y. Xi

Xi'an Jiaotong University, China, People's Republic of

Analysis on the Causes of Unqualified AC Withstand Voltage Measurement on the Valve Side of a Converter Transformer

Q. Xie, L. Chen, Z. Zhang, R. Liu, Y. Feng

State Grid Sichuan Electric Power Research Institute, China, People's Republic of

Study on gas production difference of ester insulating oil under discharge fault

Y. Xing, C. Li, Q. Ma, M. Dong

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

Complex Thermal Expansion of an Epoxy-Fiberglass Laminate

J. Grace¹, A. T. Wilder²

¹Colorado School of Mines, USA; ²The University of Texas at Austin, USA

Comparison between improved Mask R-CNN and SOLOv2 in automatic detection of electro-thermal defects in substations

Y. Yang, F. Gao, L. Li, N. Yang, P. Jia, S. Han

China Electric Power Research Institute, China

Experimental verification of the space charge measurement method based on optoelectronics principles

H. Gao¹, Q. Li¹, H. Ren¹, Y. Shi¹, S. Cheng¹, T. Qi¹, Z. Wang²

¹State Key Laboratory of Alternate Electrical Power System with Renewable Energy Sources, North China Electric Power University, Beijing 102206, China; ²College of Engineering, Mathematics and Physical Sciences, University of Exeter, Exeter, EX44QJ, UK

Study of permittivity change in the cervical cell membrane 3D realistic model due to application of nanosecond electric field using SRD based pulse generator

M. KUMAR, A. Mishra

IIITA, India

AC Breakdown Voltage of Mineral Oil, Synthetic and Natural Esters – Based Fe₃O₄ Nanofluids

U. Khaled, A. Beroual

University of Lyon, Ecole Centrale de Lyon, AMPERE Lab CNRS UMR 5005

Effect of Winding Insulation Thickness on Partial Discharge Degradation and Life Characteristics of Enamel Twisted Pair

S. Kodama¹, Y. Zenda¹, M. Kozako¹, M. Hikita¹, N. Hayashizaka², H. Kikuchi³

¹Kyushu Institute of Technology; ²Sumitomo Seika Chemicals Co, Ltd.; ³Hide Technology LLC.

Partial Discharge Inception Characteristics of Bubbles with Different Sizes in Oil-paper Insulation

J. Zhou, Q. Zhang, R. Zhang, Z. Wu, T. Wen, C. Guo

Xi'an Jiaotong University, China, People's Republic of

Acoustic-Electrical Combined Localization for Partial Discharge Based on Chaotic Elite Harris Hawks Optimization Algorithm

Y. Xi, R. Chen, Y. Liu, K. Wang, C. Zhang, M. Dong

Xi'an Jiaotong University, China, People's Republic of

Detection of insulation defects on generator bars and coils using an instrumented impact test

F. Lafleur, H. Provencher, M. Lévesque, S. Pelletier

Institut de Recherche d'Hydro-Québec, Canada

FA - 01: Failure Analysis Session 1

Time: Tuesday, 21/June/2022: 3:30pm - 5:30pm · Location: Meeting Room 301-A

Session Chair: Aleksandr Khazanov

3:30pm - 3:50pm

Copper: An Element of Interest

L. Arvidsson

VPdiagnose AB, Sweden

3:50pm - 4:10pm

Condition Assessments of 50 Year Old Low Voltage Power Cables

T. A. Toll, P. R. Ward, C. R. Ferree, P. N. Ellis, C. D. Sexton

Analysis and Measurement Services Corporation, United States of America

4:10pm - 4:30pm

Online Partial Discharge Monitoring and Failure Analysis Case Study of a 275 kV Oil Filled Cable Termination

B. J. Ward¹, T. Whyte²

¹Powerlink Queensland, Australia; ²EA Technology Australia

4:30pm - 4:50pm

Influence of Transformer Axial-Clamping Loss on the Vibration of Transformers

A. Wuerde¹, J. N. Kahlen², N. Langenberg¹, A. Moser¹

¹IAEW at RWTH Aachen University, Germany; ²Fraunhofer Institute for Applied Information Technology FIT, Sankt Augustin, Germany

4:50pm - 5:10pm

Machine Stator Windings On-site Assessment Challenges and Recommendations for Reliability and Condition Monitoring

A. Trivedi¹, S. U. Haq², M. T. Moorthy², D. Desrochers¹

¹Delom/Wajax; ²GE Power Conversion

5:10pm - 5:30pm

An Assessment of high failure rate of pole-mounted transformers using Probabilistic Risk Evaluation of Lightning Arresters

N. Koalana, P. N. Bokoro

University of Johannesburg, South Africa

RM - S2: Rotating Machines Session 2

Time: Tuesday, 21/June/2022: 3:30pm - 5:30pm · Location: Ballroom G
Session Chair: Reza Soltani

3:30pm - 3:50pm

Effect of performing DC tests before dielectric frequency response on a MV stator

E. Calo, R. Álvarez, H. Mayora, L. Catalano, P. Morcelle

IITREE - LAT, Argentine Republic

3:50pm - 4:10pm

How does PDIV change during isothermal ageing of magnet wire

M. Szczepanski^{1,2}, L. Fetouhi^{1,2}, M. Sabatou¹, S. Dreuilhe¹, S. Pin¹, C. Van de Steen¹, G. Belijar¹

¹IRT Saint Exupéry; ²Nidec Leroy-Somer

4:10pm - 4:30pm

Stress grading performance of form wound motor coil under initial heat cycle load

Y. Kimura², Y. Yao¹, M. Sato¹, A. Kumada¹, K. Hidaka^{1,2}, T. Okamoto³, T. Sakurai³, Y. Yamanaka⁴, T. Umemoto⁴

¹The University of Tokyo, Japan; ²Tokyo Denki University, Japan; ³Toshiba Mitsubishi Electric Industrial Systems Corporation, Japan; ⁴Advanced Technology R&D Center, Mitsubishi Electric Corporation, Japan

4:30pm - 4:50pm

Machine Learning and Uncertainty Quantification for Motor Predictive Maintenance

G. Jones¹, N. Frost Ph.D.²

¹SmartUQ, United States; ²Frosty's Zap Lab LLC, United States

4:50pm - 5:10pm

PD detection in inverter-fed machines using fiber-optic acoustic emission sensors. A preliminary investigation.

A. Cavallini¹, A. Zadeh², N. Lebedev², E. Concettoni³, S. Luna³, F. Rosignoli³, A. Rumi¹

¹University of Bologna, Bologna, Italy; ²Optics11, Amsterdam. the Netherlands; ³Loccioni Spa, Angeli di Rosora, Italy

5:10pm - 5:30pm

Correction Factor for Insulation Resistance of Salient Poles

J. Pedneault-Desroches, S. Bernier

Hydro-Québec, Canada

SG_OI - 01: Switchgear and Outdoor Insulation - Session 1

Time: Wednesday, 22/June/2022: 10:00am - 12:00pm · *Location:* Meeting Room 301-A

Session Chair: Mark Winkeler

10:00am - 10:20am

A comparison of different PD detection techniques for complete assemblies of air-insulated switchgear

M. Lachance¹, F. Rosa²

¹OMICRON electronics Canada Corp; ²Technologies Dual-ADE inc.

10:20am - 10:40am

Magnetic Signature of Vacuum Interrupters during Load Switching

N. Guo, K. Whitmore, M. Cohen, T. Shekari, R. Beyah, L. Graber

GEORGIA INSTITUTE OF TECHNOLOGY, United States of America

10:40am - 11:00am

Separation of Partial Discharge Faults in Metal-clad Switchgear Based on Pulse Shape Analysis

G. A. Hussain¹, W. Hassan², F. Mahmood², J. A. Kay³

¹American University of Kuwait (AUK), Kuwait; ²University of Engineering & Technology, Lahore, Pakistan; ³Rockwell Automation, Canada

11:00am - 11:20am

Simulation of HFCT PD Detection in MV Bus Bar Chamber

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

¹University of Strathclyde, United Kingdom; ²EDF Energy, Nuclear Generation, United Kingdom

11:20am - 11:40am

Statistical Analysis of Varistor Capacitance under Slow-Front Overvoltages

L. Muremi, P. Bokoro, W. Doorsamy

University of Johannesburg, South Africa

TR - 02: Transformers Session 2

Time: Wednesday, 22/June/2022: 10:00am - 12:00pm · Location: Ballroom G
Session Chair: Diego Robalino

10:00am - 10:20am

Determination of Relative Thermal Performance of Power Transformers Using Data Driven Thermal Models

A. Doolgindachbaporn¹, G. Callender², P. Lewin², E. Simonson³, G. Wilson⁴

¹King Mongkut's University of Technology Thonburi; ²University of Southampton; ³Southampton Dielectric Consultants; ⁴National Grid Electricity Transmission

10:20am - 10:40am

Practical Considerations for the Usage of Ester Fluids in Distribution Transformers

R. Breazeal², A. Sbravati¹, D. Robalino³

¹Cargill, United States of America; ²Southern California Edison; ³Megger Corporation

10:40am - 11:00am

Indian Experience with Commissioning of World's First 400kV Natural Ester Based Shunt Reactor

D. N. Jha, P. Ghosh, R. K. Jain, P. R. S. Yadav, A. K. Gupta

Power Grid Corporation Of India Limited, India

11:00am - 11:20am

Evaluation of DFIG Wind Turbine Generator and Transformer Conditions with Electrical Signature Analysis

H. W Penrose

MotorDoc LLC, United States of America

11:20am - 11:40am

Comparative analysis of transformer solid insulation drying methods

O. Mazur, J. Mora, A. Dannik, D. Wilson

Globecore GmbH, Germany

11:40am - 12:00pm

Comparative method for assessing cellulose-based paper degradation rate immersed in different fluids

A. Sbravati, K. Rapp, K. Wirtz

Cargill, United States of America

TT - 02: Testing Technologies Session 2

Time: Wednesday, 22/June/2022: 1:30pm - 3:10pm · Location: Meeting Room 301-A
Session Chair: Aleksei Nikolaev

1:30pm - 1:50pm

Thermal Conductivity of Filler and Un-filler Potting Materials

T. T. Nguyen

Elantas inc., United States of America

1:50pm - 2:10pm

AC and DC Electrical Strength of Thermally Conductive Insulating Foils under Various Conditions

M. Scheler¹, L. Reissenweber¹, S. Hetzel¹, T. Fischer¹, M. Rossner¹, A. Stadler¹, W. Pohl², T. Doering²

¹Coburg University of Applied Sciences and Arts, Germany; ²HALA Contec GmbH & Co. KG, Germany

2:10pm - 2:30pm

Surface Wave Based Non-conductor-contact Reflectometry Method for Insulation and Jacket Damage Detection in Multi-Conductor Cables

A. S. Arman¹, S. W. Glass III², L. S. Fifield², M. Ali¹

¹University of South Carolina, Columbia, SC, USA; ²Pacific Northwest National Laboratory, Richland, WA, USA

2:30pm - 2:50pm

Tracking and Erosion Performance of Alumina Trihydrate/ Aluminium Nitride filled Micro and Nano Silicone Rubber Composites

B. S. A V, M. J. Thomas, D. Kaushik

Indian Institute of Science, Bangalore, India.

2:50pm - 3:10pm

Field-Grading Effect of a Polymer-Nanoparticle Composite on Medium-Voltage Power Module Substrates

Z. Zhang^{1,2}, Q. Yuchi³, F. Boshkovski^{2,3}, K. D. T. Ngo^{1,2}, G.-Q. Lu^{1,2,3}

¹Bradley Department of Electrical and Computer Engineering, Virginia Tech, Blacksburg, VA; ²Center for Power Electronics Systems (CPES), Virginia Tech, Blacksburg, VA; ³Department of Materials Science and Engineering, Virginia Tech, Blacksburg, VA

RM - S3: Rotating Machines - S3

Time: Wednesday, 22/June/2022: 1:30pm - 3:10pm · Location: Ballroom G
Session Chair: Anna Gegenava

1:30pm - 1:50pm

Reflections on the On-Line Partial Discharge Monitoring and Analysis for Condition Assessment of large Generators and Motors

M. Huzmezan

Power Diagnostix Systems GmbH, Germany

1:50pm - 2:10pm

Lifetime estimation of type I random-wound electrical machines under active thermal cycling

S. Pin¹, S. Dreuilhe¹, L. Fetouhi^{1,2}, M. Szczepanski^{1,2}, S. Stemmer¹, G. Belijar¹

¹IRT Saint Exupéry, France; ²NIDEC Leroy-Somer

2:10pm - 2:30pm

Investigating the effect of space charge accumulation on partial discharges activity for unaged and thermally aged Glass fibre insulated wire

H. Naderiallaf¹, P. Giangrande¹, M. Galea^{1,2}

¹Power Electronics, Machine and Control Group, University of Nottingham, The United Kingdom; ²Department of Industrial Electrical Power Conversion, The University of Malta

2:30pm - 2:50pm

Aging study in electromechanical chain: design of experiment definition using step stress tests

S. Pin¹, M. Sabatou¹, M. Szczepanski², S. Dreuilhe¹, L. Fetouhi², G. Belijar¹

¹IRT Saint Exupéry, France; ²Leroy Somer, France

2:50pm - 3:10pm

Can Corona Resistant wires ensure reliability in aerospace machine insulation?

A. Rumi, J. G. Marinelli, A. Cavallini, P. Seri

University of Bologna, Italy