13th International Conference on the Properties and Applications of Dielectric Materials

ICPADM 2021

Emerging Dielectrics for Energy Sustainability

PROGRAM BOOK

VIRTUAL CONFERENCE

12-14 JULY 2021

Hosted by: UTM Universiti Teknologi Malaysia

Organized by: IEEE DEIS

Sponsored by: TNB Labs

Board of Engineers Malaysia (BEM)
Approved CPD/PDP Hours: 18 Hours
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Hosted by:

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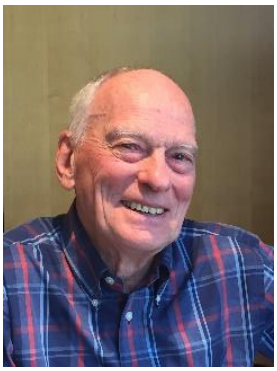
WELCOMING REMARKS BY ICPADM 2021 INTERNATIONAL ADVISORY COMMITTEE CHAIR



ICPADM conferences began in 1984 as the brainchild of Professor Liu Ziyu at Xi'an Jiaotong University and Professor Kwan C Kao at the University of Manitoba, Canada. When Chinese President Mao Zedong passed away in 1978 it took China just a few years to realise that they must look outward and internationally if they were to progress and develop. Under the guidance of the DEIS Treasurer at the time, Dr Eric Forster, the ICPADM conferences were formed and since the first ICPADM conference in 1985 have provided a significant role for the promotion of mutual understanding and international collaboration. The ICPADM was the first Pan-Asian conference sponsored by the DEIS and continues to hold the distinction of still being the premier DEIS Pan-Asian conference.

To quote the late Professor KC Kao, Founder of the ICPADM, "The main purpose of international conferences is to provide an opportunity for engineers and scientists to report on their studies, to exchange their experiences with each other, and to seek cooperation or collaboration between people with common interests. The aim of research is to create new knowledge that would directly or indirectly benefit mankind. Research products should be considered as a treasure that belongs to all people of the world, without boundaries. The most efficient way of promoting progress of research is to share research experiences and to join the effort through international cooperation and collaboration. The ICPADM sets a good example."

The conference organizers ably led by Professors Zulkurnain Abdul-Malek and Kwan Yiew Lau are to be congratulated as they have completed a mammoth task. First-of-all, putting together an excellent technical program and then converting it to a virtual program, so, on behalf of my IAC colleagues, sit back, relax, and enjoy our first virtual ICPADM conference.

Harry Orton
International Advisory Committee (IAC) Chair,
13th International Conference on the Properties and Applications of Dielectric Materials (ICPADM 2021)

WELCOMING REMARKS BY ICPADM 2021 GENERAL CHAIR

It is my great pleasure to welcome you to IEEE 13th International Conference on Properties and Applications of Dielectric Materials (ICPADM 2021). The conference is aimed at providing a forum for sharing and exchange of ideas in the field of dielectric materials among members of international academic and engineering community.

ICPADM is a conference series with long history. The conference venues are Xi'an China (1985, 1st ICPADM), Beijing China (1988, 2nd ICPADM), Tokyo Japan (1991, 3rd ICPADM), Brisbane Australia (1994, 4th ICPADM), Seoul Korea (1997, 5th ICPADM), Xi'an China (2000, 6th ICPADM), Nagoya Japan (2003, 7th ICPADM), Bali Indonesia (2006, 8th ICPADM), Harbin China (2009, 9th ICPADM), Bangalore India (2012, 10th ICPADM), Sydney Australia (2015, 11th ICPADM), and Xi'an China (2018, 12th ICPADM).

ICPADM 2021 is for the first time coming to Malaysia. It is organized by IEEE DEIS and hosted by Universiti Teknologi Malaysia. We would like to thank the International Advisory Committee chaired by Dr Harry Orton for giving us this opportunity to host this IEEE DEIS flagship conference in Malaysia. It was originally planned to be held in Johor Bahru, Malaysia. We were busy planning for the conference when the whole world is suddenly faced with COVID-19 pandemic. After some lengthy discussions within the local committee as well as with the International Advisory Committee and taking into consideration of the importance of the event, we decided to proceed with the planned event and the conference is to be conducted virtually.

It is our honour to welcome all participants to this virtual conference. We would like to thank all the keynote speakers, authors, and reviewers for their contributions to this conference. We would also like to thank TNB Labs for its sponsorship. Last but not least, I would like to thank all the organizing committee members who come from various organisations throughout Malaysia, you have indeed worked very hard to make this conference a success.

We are looking forward to seeing you in this virtual event from 12th to 14th July 2021. Despite the conference being fully online, I sincerely hope that ICPADM 2021 provides you a pleasant experience with many lively discussions as well as new contacts and networking.

Zulkurnain Abdul Malek
General Chair,
13th International Conference on the Properties and Applications of Dielectric Materials (ICPADM 2021)

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PROGRAM AT A GLANCE

Note: All times are based on Malaysian local time (GMT +8 hours)

ICPADM 2021 Program Schedule

Time	12 July 2021 (Monday)			13 July 2021 (Tuesday)			14 July 2021 (Wednesday)		
08:00-08:15									
08:15-08:30									
08:30-08:45	Opening Ceremony (Opening speech 20 min)								
08:45-09:00									
09:00-09:15	Plenary Session 1 (35 min) Professor Gian Carlo Montanari			Plenary Session 3 (35 min) Professor Shengtao Li			Plenary Session 4 (35 min) Professor Masayuki Hikita		
09:15-09:30									
09:30-09:45									
09:45-10:00	Break			Break			Break		
10:00-10:15	Oral Session 1 Track CM-1	Oral Session 2 Track GD-1	Oral Session 3 Track OT-1	Oral Session 7 Track CM-4	Oral Session 8 Track NM-1	Oral Session 9 Track DP-2	Oral Session 13 Track CM-7	Oral Session 14 Track NM-2	Oral Session 15 Track EI-2
10:15-10:30									
10:30-10:45									
10:45-11:00									
11:00-11:15									
11:15-11:30									
11:30-11:45									
11:45-12:00									
12:00-12:15	Lunch Break			Lunch Break ICPADM 2021 International Advisory Committee and Local Organizing Committee Meeting (members will be invited)			Lunch Break		
12:15-12:30									
12:30-12:45									
12:45-13:00									
13:00-13:15									
13:15-13:30									
13:30-13:45									
13:45-14:00									
14:00-14:15	Oral Session 4 Track CM-2	Oral Session 5 Track CM-3	Oral Session 6 Track DP-1	Oral Session 10 Track CM-5	Oral Session 11 Track CM-6	Oral Session 12 Track EI-1	Oral Session 16 Track CM-8	Oral Session 17 Track EI-3	Oral Session 18 Track DP-3
14:15-14:30									
14:30-14:45									
14:45-15:00									
15:00-15:15									
15:15-15:30									
15:30-15:45									
15:45-16:00	Break								
16:00-16:15	Plenary Session 2 (35 min) Professor Alun Vaughan			Break			Break		
16:15-16:30				Virtual Visit			Closing Ceremony		
16:30-16:45									
16:45-17:00									

Session Legends

Coding	Track
CM	Condition Monitoring
DP	Dielectric Phenomena
EI	Electrical Insulation
GD	General Dielectric
NM	Nanomaterial
OT	Others

PLENARY SESSIONS

12th July 2021 (Monday)

Session: Plenary 1

Title: Reliability of HVDC and MVDC Electrical Asset: The Challenge of Insulation Design
Presenter: Professor Gian Carlo Montanari (Florida State University, USA)

Time: 9:00 - 9:45am
Chair: Kwan Yiew Lau

SYNOPSIS

Reliability of DC electrical asset components has not been investigated as broadly as for sinusoidal AC supply. On the other hand, DC assets are more and more common, and they are forecasted to grow in number, power, and voltage in the near future. This is not only in transmission grids, but also in distribution/generation (renewables), industrial application and electrification transportation. To complicate the framework, it has to be recognized that DC asset components are not only subjected to DC steady-state voltage, but also to voltage and temperature transients, as those coming from energization, voltage polarity inversion, ripple, repetitive voltage impulses and load variations. The major issue to asset component reliability can come, in these conditions, from electrical insulation. While designing insulation under AC sinusoidal voltage is a century-long practice, with many feedbacks from field installations, the same does not hold for modulated sinusoidal (i.e., power electronics) and DC supply. Electrical stresses can be different in magnitude and distribution from AC to DC, and load variations in DC can contribute to electric stress variations much more than in AC. All of this may impact significantly on aging rate and reliability of electrical insulation. The plenary lecture discusses the difference between electric field distribution, and consequent aging mechanisms and rate, from AC sinusoidal to DC supply, considering, in particular, the real DC operating conditions during which voltage and load transients can occur frequently. The contribution of partial discharges to aging rate will be also taken into account, bringing to the derivation of a probabilistic life model that can allow reliability estimations in the design of DC insulation systems to be achieved.

12th July 2021 (Monday)

Session: Plenary 2

Title: Nanocomposites: Pathways to Dielectric Success
Presenter: Professor Emer Alun Vaughan (University of Southampton, United Kingdom)

Time: 16:00 - 16:45pm
Chair: Zulkurnain Abdul Malek

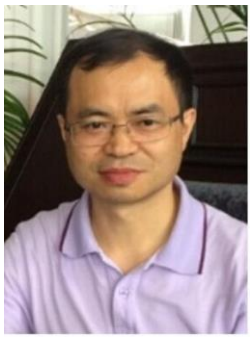
SYNOPSIS

Dielectric materials constitute a critical component of all electrical systems. As the impact of the continued emission of greenhouse gases into the atmosphere is increasingly being appreciated, an energy revolution is underway that will require new technologies and new material solutions. While a number of approaches may be considered for this, the concept of designing bespoke molecules is rarely attractive on cost grounds, albeit that Borealis has deliberately introduced a degree of unsaturation into some polyethylene high voltage insulation grades, to ease peroxide crosslinking. In general, a more attractive methodology involves the modification of existing materials through the inclusion of some "additive", to give improved performance.

An example of this strategy, which has attracted global interest, concerns the addition of nanoparticles to bulk commodity polymers to form nanocomposites or, in the area of dielectrics, so-called nanodielectrics. Since the general concept was first discussed in the early 1990s, a vast body of experimental results has emerged, coupled with numerous hypotheses that attempt to explain the phenomena that have been observed. However, in view of the range of results reported and, frequently, their contradictory nature, how much do we really understand about the fundamental processes that underpin these materials?

The plenary lecture focuses on one technologically important class of insulating polymer, namely, thermosetting systems based upon epoxy resins, which are widely used in applications such as bushings and rotating machines. It reviews the molecular principles that underpin these materials, considers a number of strategies by which properties can be modified through the inclusion of nanofillers (silicon nitride and graphene oxide), reactive molecular additives and hybrid systems based upon poly oligomeric silsesquioxanes which, in different studies, have been considered either as limitingly small nanosilica particles or as large, reactive molecules. The way in which the presence of such additives affects the host polymer will be described and a novel interpretation of the dielectric gamma relaxation in epoxy resins will be presented, which has potentially important implications for our understanding of charge transport through this practically important insulation material.

13th July 2021 (Tuesday)



Session: Plenary 3

Title: High Dielectric and Energy Storage Polymer Dielectrics
Presenter: Professor Dr. Shengtao Li (Xi'an Jiaotong University, China)

Time: 9:00 - 9:45am
Chair: Mohd Zainal Abidin Ab Kadir

SYNOPSIS

The continuous miniaturization of electronic devices and electric equipment requires high energy-storable dielectric capacitors. Therefore, seeking dielectric materials with high power density and high energy density becomes more urgent for ensuring their reliability. However, the contradiction between the increase in the dielectric constant and breakdown strength severely limits the sustainable increase in the energy density of polymer dielectrics. Here, recent advances in high dielectric and energy storage polymer dielectrics will be introduced. Polymer structure is an important factor in determining dielectric properties and energy storage characteristics of polymers, while the relationship between them is still unclear, which hinders the design of high energy-storable polymers. Our emphasis will be given to how to tailor the polymer structures for high dielectric and energy-storable polymer dielectrics. The effect of the polymer structures on the polarization and charge transport characteristics are also carefully discussed for further understanding the structure-property relationship. Finally, the follow-up research is briefly introduced. We intend that this work will help academics and industry toward high energy-storable polymer capacitors.

14th July 2021 (Wednesday)

Session: Plenary 4

Title: Electrical Insulation Properties of Innovative Functionally Insulating Material toward Application to Electric Power Apparatus
Presenter: Professor Dr. Masayuki Hikita (Kyushu Institute of Technology, Japan)

Time: 9:00 - 9:45am
Chair: Mohd Taufiq Ishak

SYNOPSIS

Electric power apparatus such as electric power generators and SF6 gas insulated switchgear (GIS) are essential for generating, distributing, controlling and using large amounts of electricity. The performance of the insulating materials used in the apparatus greatly affects the energy saving, efficiency, reliability, and downsizing. Existing insulating materials have been improved over the last few decades. However, it is difficult to enhance the energy efficiency, efficiency, reliability, and miniaturization of electric power equipment by further improving these insulating materials. In order to overcome this, it is necessary to develop an innovative functional insulating material that is not on the conventional extension line.

From this point of view, the development of functional insulating materials for electric power equipment is being actively researched not only in Japan but also in North America, China, Europe, and other areas worldwide. A project on development of new types of electric power apparatus such as large-scale generator, gas insulated switchgear (GIS) and medium and small-scale generator are ongoing in Japan for the purpose of energy saving with novel insulators based on nano-composite and/or functionally grading materials (FGM).

Under the circumstances, the plenary lecture presents electrical insulation properties of innovative functionally insulating material prepared toward the application to the insulation system of electric power apparatus such as GIS and inverter-fed rotating machines. Typical experiments are conducted on short time breakdown properties and impulse flashover test as well as long term V-t test for newly developed corn type insulating spacer made of nanocomposite, and durability test of the enamel containing nano-cray under artificial inverter surge condition. Experimental results show the materials and trial pieces of the insulators have sufficiently high performance to realize downsizing or long lifetime of the apparatus. An attempt is also made to interpret measured results using fluid dynamic simulation modeling and estimation of breakdown voltage of GIS model spacers based on the volume time theory and quantum chemical calculation.

TECHNICAL PROGRAM – DAY 1

12th July 2021 (Monday)
Time: 10:00am – 12:00pm
ORAL SESSION 1
Session Theme: Condition Monitoring (CM-1)
Chair: Zulkarnain Ahmad Noorden

		Presenter
10:00	**Harmonic Currents Generated by MV Modular Converters and Thermal Insulation Aging of Polymeric Cables** *Matthew Bosworth (Florida State University, USA); Gian Carlo Montanari (FSU, USA); Mischa Steurer and Lu Wang (Florida State University, USA); Riddhi Ghosh (University of Bologna, India); Patrick Lewis (Hepburn and Sons LLC, USA)*	Gian Carlo Montanari
10:15	**Optimization of Grading Ring Design for Metal Oxide Arrester Using Gravitational Search Algorithm** *Hazlee Azil Illias and Chea Zern Hong (University of Malaya, Malaysia); Kalaiselvi Aramugam (UCSI University, Malaysia); Hazlie Mokhlis (University of Malaya, Malaysia); Azrul Mohd Ariffin (Universiti Tenaga Nasional, Malaysia); Mohd Fairouz Mohd Yousof (Universiti Tun Hussein Onn Malaysia, Malaysia)*	Hazlee Azil Illias
10:30	**Electric Thermal Coupling Field Calculation of GIS Conductor Joint** *Zhikai Li (Xi'an Jiaotong University, China); Shouwen Liu (State Grid Hubei Electric Power CO. LTD, China); Li Xiukun (Electric Power Research Institute CGIT(Jiangsu) High Voltage Power Co., Ltd, China); Bo Yue (State Grid Economic And Technological Research Institute State Grid, China); Peng Liu (State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, China); Zongren Peng (State Key Laboratory of Electrical Insulation and Power Equipment, China)*	Zhikai Li
10:45	**The Effect of Tap Changer Coking and Pitting on Frequency Response Analysis Measurement of Transformer** *Salem Mgammal Al-Ameri (Faculty of Electrical & Electronics Engineering, University Tun Hussein Onn Malaysia, Malaysia); Mohd Fairouz Mohd Yousof and Muhammad Saufi Kamarudin (Universiti Tun Hussein Onn Malaysia, Malaysia); Hazlee Azil Illias (University of Malaya, Malaysia)*	Salem Al-Ameri
11:00	**Classification of Partial Discharges in Insulation Materials via Support Vector Machine and Discrete Wavelet Transform** *Hazlee Azil Illias, Ying Ting Neoh and Zhen Yu Ong (University of Malaya, Malaysia); Masaaki Kando (Tokai University, Japan); Azrul Mohd Ariffin (Universiti Tenaga Nasional, Malaysia); Mohd Fairouz Mohd Yousof (Universiti Tun Hussein Onn Malaysia, Malaysia)*	Hazlee Azil Illias
11:15	**Aging Effects on Structure and Breakdown Properties of Polypropylene/Multi-Element Oxide Nanocomposites** *Aizat Azmi (Universiti Teknlogi Malaysia, Malaysia); Kwan Yiew Lau (Universiti Teknologi Malaysia, Malaysia); Noor Azlinda Ahmad (Institute of High Voltage & High Current, Universiti Teknologi Malaysia, Malaysia); Zulkurnain Abdul-Malek (Universiti Teknologi Malaysia & Institute of High Voltage and High Current, Malaysia); Zulkarnain Ahmad Noorden (Institute of High Voltage and High Current (IVAT) & Universiti Teknologi Malaysia, Malaysia); Mohd Aizam Talib (TNB Research Sdn Bhd & High Voltage Diagnostic Group, Malaysia)*	Aizat Azmi

11:30	**Fault Identification in Power Transformers Using Dissolve Gas Analysis and Support Vector Machine** *Hazlee Azil Illias, Kai Choon Chan and Zhao Liang Wee (University of Malaya, Malaysia); Hazlie Mokhlis (University of MAlaya, Malaysia); Azrul Mohd Ariffin (Universiti Tenaga Nasional, Malaysia); Mohd Fairouz Mohd Yousof (Universiti Tun Hussein Onn Malaysia, Malaysia)*	Hazlee Azil Illias
11:45	**Electric Field and Potential Changes Studies on Cast-Resin Dry-Type Power Transformer Having Misalignment** *Muhammad Jazmi Jaafar (School of Electrical and Electronics, University Sains Malaysia, Malaysia); Nor Asiah Muhamad and Mohamad Kamarol Mohd Jamil (Universiti Sains Malaysia, Malaysia); Norfadilah Rosle (Universiti Malaysia Perlis, Malaysia)*	Norfadilah Rosle

12th July 2021 (Monday)

Time: 10:00am – 12:00pm

ORAL SESSION 2

Session Theme: General Dielectric (GD-1)

Chair: Mona Riza Mohd Esa

		Presenter
10:00	**Insulating Properties of Eco-Friendly Natural Esters Derived from Non-Edible Vegetable Oil** *Gnanasekaran Dhorali (CENTRAL POWER RESEARCH INSTITUTE, India); Anil Chavan (Central Power Research Institute, India); P. Thomas (Central Power Research Institute, Bangalore, India)*	Gnanasekaran Dhorali
10:15	**Breakdown Strength and Stability of Palm Oil Toughened with Natural Fibres as Liquid Insulation Material** *Mohamad Zul Hilmey Makmud and Jedol Dayou (Universiti Malaysia Sabah, Malaysia); Hazlee Azil Illias (University of Malaya, Malaysia)*	Mohamad Makmud
10:30	**Synthesis, Structural and Dielectric Characteristics of Liquid Crystalline Azo-Based Compounds with Different Terminal Length** *Zuhair Jamain and Samerah Habil (Faculty of Science and Natural Resources, Universiti Malaysia Sabah, Malaysia); Mohamad Zul Hilmey Makmud (Universiti Malaysia Sabah, Malaysia); Melati Khairuddean (School of Chemical Sciences, Universiti Sains Malaysia, Malaysia)*	Zuhair Jamain
10:45	**Dissolved Gas Analysis of Thermally Aged Mineral Oil and Vegetable Oil Based Nanofluids** *Prabhat Kumar Maiti (Central Power Research Institute, India); Manas Chakraborty (Central Power Research Institute (CPRI), India)*	Prabhat Kumar Maiti
11:00	**A Comprehensive Survey on Alternating Fluids Used for the Enhancement of Power Transformers** *Gopakumar S (Rohini College of Engineering and Technology, India); Sree Raja (Anna University of Technology, India)*	Gopakumar S
11:15	**Study on the Thermodynamic Stability of the Organic Dielectrics in the Photovoltaic Cell** *Richard Kyung (CRG-NJ, USA); Christopher Lee (Choice Research Group(CRG-NJ), USA)*	Richard Kyung

11:30	Anti-Electrostatic Electric Discharge Performance of ZnO/Silicone Rubber Composite with Nonlinear Conductivity *Ya Sun (Tsinghua University, China); Jun Hu (Tsinghua, China); Zhikang Yuan (Tsinghua University, China)*	Ya Sun

12th July 2021 (Monday) Time: 10:00am – 12:00pm ORAL SESSION 3 Session Theme: Others (OT-1) Chair: Miszaina Osman	Presenter
10:00 Characterization of Cold Plasma with Glow Discharge Mechanism of Plasma Jet System *Norhafezaidi Mat Saman (Institute of High Voltage & High Current, Malaysia); Mohd Hafizi Ahmad and Zolkafle Buntat (Universiti Teknologi Malaysia, Malaysia); Zainuddin Nawawi (Universitas Sriwijaya, Indonesia); Muhammad Abu Bakar Sidik (Faculty of Engineering, Universitas Sriwijaya Ogan Ilir, Indonesia); Muhammad Irfan Jambak (Faculty of Engineering, Universitas Sriwijaya Ogan Ilir, Indonesia)*	Norhafezaidi Mat Saman
10:15 Effect of AC Interference on HV Underground Cables Buried Within Transmission Lines Right of Way *Zoolnasri Abu Harun (Jabatan Kerja Raya, Malaysia); Miszaina Osman and Azrul Mohd Ariffin (Universiti Tenaga Nasional, Malaysia); Mohd Zainal Abidin Ab Kadir (Universiti Putra Malaysia, Malaysia)*	Zoolnasri Abu Harun
10:30 Localization with Phase Resolved Partial Discharge Measured with High Frequency Current Transformer *Kai Xian Lai, Nor Fazlinda Mohd Affandi, Bing Hong Leck, Yongyi Fu and Seng Kok Ang (SP PowerGrid, Singapore)*	Kai Xian Lai
10:45 Comparative Analysis of the Effect of Different Substrates Materials on Microstrip Patch Antenna Operating at 3.6 GHz *Ayodeji Ireti Fasiku (Univeriti Teknologi Malaysia, Malaysia); Yakub Bolaji Olufadi (Bauchi State University Gadau Nigeria & School, Nigeria); Olaoluwa Adegboye (University of Uyo, Nigeria)*	Yakub Olufadi
11:00 Vacuum DC Flashover Performance Improvement by CF4 Radio Frequency Capacitively Coupled Plasma *Chenxu Wang (Xi'an Jiaotong University, China); Xingyu Chen, Bo Zhang and Yuhao Sun (Xi'an Jiaotong University, China); Ya'nan Peng (Xi'an Jiaotong University, China); Guan-Jun Zhang (State Key Laboratory, Xi'an Jiaotong University, China)*	Chenxu Wang

12th July 2021 (Monday)
Time: 14:00 – 16:00pm
ORAL SESSION 4
Session Theme: Condition Monitoring (CM-2)
Chair: Noor Azlinda Ahmad

		Presenter
14:00	**Mitigation of Degradation in Polymers by Gamma Rays** *Yoshimichi Ohki and Yu Miyazaki (Waseda University, Japan); Haolong Zhou (Waseda University, China); Momoka Sumita, Takumi Someya and Naoshi Hirai (Waseda University, Japan)*	Yoshimichi Ohki
14:15	**Research on Aging Performance and Mechanism Analysis of Cross-Linked Polyethylene Wire and Cable Materials** *Tian Chongjun (New Far East Cable Co., Ltd., China); Ye Daolin and Xing Weiyi (University of Science and Technology of China, China)*	Tian Chongjun
14:30	**Advanced Polymeric Cable Degradation Diagnostics Using Time Domain Reflectometry Technique** *Tze Mei Kuan, Azrul Mohd Ariffin and Suhaila Sulaiman (Universiti Tenaga Nasional, Malaysia); Hazlee Azil Illias (University of Malaya, Malaysia); Wong Jee Keen Raymond (Tunku Abdul Rahman University College, Malaysia)*	Tze Mei Kuan
14:45	**Development of Power Transformer Remaining Life Model Using Multi-Parameters** *Rahman Azis Prasojo (Institut Teknologi Bandung, Indonesia); Achmad Setiawan (PT PLN (Persero), Indonesia); Suwarno Suwarno and Nur Ulfa Maulidevi (Institut Teknologi Bandung, Indonesia); Bambang Anggoro S. P. (School of Informatics and Electrical Engineering, Bandung Institute of Technology, Indonesia)*	Rahman Azis Prasojo
15:00	**Classification of Degraded Polymer Insulator Using Support Vector Machine** *Asri Din (Universiti Teknikal Malaysia Melaka, Malaysia); M. Afendi M. Piah (Universiti Teknologi Malaysia & Institute of High Voltage and High Current, Malaysia); Abdul Rahim Abdullah (Universiti Teknikal Malaysia Melaka, Malaysia); Farrah Salwani Abdullah (Universiti Teknologi Malaysia (UTM) & Universiti Malaysia Perlis (UniMAP), Malaysia)*	Asri Din
15:15	**Three-Dimensional Visualization Technology for Ultrasonic Detection of Partial Discharges in Power Transformers** *Hao Zhang, Wu Lu, Hui Liu, Jianan Weng and Wenbin Zhao (Shanghai University of Electric Power, China); Zhiyan Peng (Shanghai University Of Electric Power, China)*	Hao Zhang
15:30	**Fault Diagnosis of the External Insulation Infrared Images Based on Mask RCNN and Perceptual Hash Joint Algorithm** *Wenbin Tang (Shanghai University of Electric Power, China); Yin Hua and Long Li (Chongqing Power Company, China); Wenbin Zhao, Wu Lu and Bingjie Wu (Shanghai University of Electric Power, China)*	Wenbin Tang

12th July 2021 (Monday)
Time: 14:00 – 16:00pm
ORAL SESSION 5
Session Theme: Condition Monitoring (CM-3)
Chair: Amir Izzani Mohamed

		Presenter
14:00	**A Tool to Determine the Hydrophobicity of Insulators Using Contact Angle of a Water Droplet** *Supun Amarathunga, Lochana Ranatunga, Prabath Lakmal, Dimuthu Saranga and Rasara Samarasinghe (University of Moratuwa, Sri Lanka); Joseph Rohan Lucas (University of Moratuwa & General Sir John Kothalawela Defence University, Sri Lanka)*	Rasara Samarasinghe
14:15	**Investigation on the Relationship Between Failure Rates and Health Index of Distribution Transformer Population** *Nor Shafiqin Shariffuddin (Universiti Kuala Lumpur British Malaysian Institute, Malaysia); Norhafiz Azis (Universiti Putra Malaysia & Centre for Electromagnetic and Lightning Protection Research, UPM, Malaysia); Amran Mohd Selva (Centre for Electromagnetic & Lightning Protection (CELP), UPM & Universiti Putra Malaysia, Malaysia); Muhammad Sharil Yahaya (Universiti Teknikal Malaysia Melaka, Malaysia); Jasronita Jasni (Universiti Putra Malaysia, Malaysia); Mohd Aizam Talib (TNB Research, Malaysia)*	Nor Shafiqin Shariffuddin
14:30	**Prediction of a Transformer's Loading and Ambient Temperature Based on SARIMA Approach for Hot-Spot Temperature and Loss-Of-Life Analyses** *Najiyah Saleh (Universiti Kuala Lumpur-British Malaysian Institute, Malaysia); Norhafiz Azis (Universiti Putra Malaysia & Centre for Electromagnetic and Lightning Protection Research, UPM, Malaysia); Jasronita Jasni and Mohd Zainal Abidin Ab Kadir (Universiti Putra Malaysia, Malaysia); Mohd Aizam Talib (TNB Research, Malaysia)*	Najiyah Saleh
14:45	**Correlating UV Visible Spectral Response and Thermal Ageing of Blended Transformer Oil** *Manas Chakraborty (Central Power Research Institute (CPRI), India); Niharika Baruah (Indian Institute of Technology, Guwahati, India); Sisir Kumar Nayak (Indian Institute of Technology Guwahati, India); Prabhat Kumar Maiti (Central Power Research Institute, India)*	Manas Chakraborty
15:00	**Implementation of Self-Organizing Map and Logistic Regression in Dissolved Gas Analysis of Transformer Oils** *Chandrima Saha (Indian Institute of Technology Guwahati, India); Niharika Baruah (Indian Institute of Technology, Guwahati, India); Sisir Kumar Nayak (Indian Institute of Technology Guwahati, India)*	Chandrima Saha
15:15	**Classification of Partial Discharge Sources by SF6 Decomposition By-Products** *Ammar Salah Mahdi (Universiti Teknologi Malaysia, Malaysia); Zulkurnain Abdul-Malek (Universiti Teknologi Malaysia & Institute of High Voltage and High Current, Malaysia); Amirreza Naderipour (Universiti Teknologi Malaysia, Malaysia); Sanuri Ishak (TNB Research Sdn Bhd, Malaysia); Mohd Nur Khaidir Hussein (TNB Research Sdn Bhd, Malaysia)*	Ammar Salah Mahdi
15:30	**SF6 Decomposition Under Protrusion Defect Partial Discharge** *Ammar Salah Mahdi (Universiti Teknologi Malaysia, Malaysia); Zulkurnain Abdul-Malek (Universiti Teknologi Malaysia & Institute of High Voltage and High Current, Malaysia); Amirreza Naderipour (Universiti Teknologi Malaysia,*	Ammar Salah Mahdi

Malaysia); Sanuri Ishak (TNB Research Sdn Bhd, Malaysia); Mohd Nur Khaidir Hussein (TNB Research Sdn Bhd, Malaysia)

12th July 2021 (Monday) Time: 14:00 – 16:00pm ORAL SESSION 6 Session Theme: Dielectric Phenomena (DP-1) Chair: Muzamir Isa		Presenter
14:00	**Effect of Large Mechanical Stress on Electrical Tree Characteristics of Silicone Rubber** *Jiaxing Weisun, Siping Miao and Man Xu (Xi'an Jiaotong University, China)*	Jiaxing Weisun
14:15	**Effect of Static Floating Particle Shapes on Partial Discharge Characteristics in Mineral Oil** *Daniar Fahmi (Institut Teknologi Sepuluh Nopember, Indonesia); Hazlee Azil Illias (University of Malaya, Malaysia); Hazlie Mokhlis (University of MAlaya, Malaysia); I Made Yulistya Negara (ITS, Indonesia)*	Daniar Fahmi
14:30	**Influence of Cellulose Fiber Contamination and Bridging on Breakdown Voltage of PFAE Under Lightning Impulse Stress** *Sarizan Bin Saaidon (Universiti Sains Malaysia & Center of Instructor and Advanced Skills Training, Malaysia); Mohamad Nur Khairul Hafizi Rohani (Universiti Malaysia Perlis, Malaysia); Mohd Aizam Talib (TNB Research, Malaysia); Nor Asiah Muhamad and Mohamad Kamarol Mohd Jamil (Universiti Sains Malaysia, Malaysia)*	Sarizan Saaidon
14:45	**Study on Charge Trapping Processes of Epoxy Resin Nanocomposites** *Xi Pang and Peng Liu (State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, China); Zongren Peng (State Key Laboratory of Electrical Insulation and Power Equipment, China); Yang Xi (Xi'an Jiaotong University, China); Yaqin Wen (State Grid Hubei Electric Power Company Electric Power Research Institute, China); Boyuan Cui (China Electric Power Research Institute, China)*	Xi Pang
15:00	**Investigation on the Effect of the Cross-Section of Insulators on the Radial Discharge Distribution of Creeping Discharges** W. E. P. Sampath Ediriweera, K. L. I. M. Pramod B Jayarathna and Rasara Samarasinghe (University of Moratuwa, Sri Lanka); Joseph *Rohan Lucas (University of Moratuwa & General Sir John Kothalawela Defence University, Sri Lanka)*	W. E. P. Sampath Ediriweera
15:15	**Effects of Graphene Coatings on Hindering Space Charge Injection in Epoxy Resin** *Paolo Seri, Simone Suraci and Davide Fabiani (University of Bologna, Italy)*	Paolo Seri

TECHNICAL PROGRAM – DAY 2

13th July 2021 (Tuesday)
Time: 10:00am – 12:00pm
ORAL SESSION 7
Session Theme: Condition Monitoring (CM-4)
Chair: Hazlee Azil Illias

		Presenter
10:00	**Carbonized Surface Tracking on Pressboard Cylinder of Oil Filled Transformer Under Main Insulation Faults** *Muzi Li (Shanghai University Of Electric Power, China); Long Li and Hua Yin (Chongqing Power Company, China); Wu Lu and Jianan Weng (Shanghai University of Electric Power, China)*	Muzi Li
10:15	**Trending of SF6 Decomposition By-Products Characteristics Under Artificially Introduced PD in GIS** *Ammar Salah Mahdi (Universiti Teknologi Malaysia, Malaysia); Zulkurnain Abdul-Malek (Universiti Teknologi Malaysia & Institute of High Voltage and High Current, Malaysia); Amirreza Naderipour (Universiti Teknologi Malaysia, Malaysia); Sanuri Ishak (TNB Research Sdn Bhd, Malaysia); Mohd Nur Khaidir Hussein (TNB Research Sdn Bhd, Malaysia)*	Ammar Mahdi
10:30	**Design of GIS Defects for Partial Discharge Induced SF6 Decomposition** *Ammar Salah Mahdi (Universiti Teknologi Malaysia, Malaysia); Zulkurnain Abdul-Malek (Universiti Teknologi Malaysia & Institute of High Voltage and High Current, Malaysia); Amirreza Naderipour (Universiti Teknologi Malaysia, Malaysia); Sanuri Ishak (TNB Research Sdn Bhd, Malaysia); Mohd Nur Khaidir Hussein (TNB Research Sdn Bhd, Malaysia)*	Ammar Mahdi
10:45	**Resistive Leakage Current Based Condition Assessment of Zinc Oxide Surge Arrester: A Review** Abdullah Munir, Abdullah Munir; Zulkurnain Abdul-Malek; Rai Naveed Arshad (Universiti Teknologi Malaysia, Malaysia)	Abdullah Munir
11:00	**Accuracy of Furanic Compund Analysis in Determining the Ageing of Power Transformers** *Mohd Aizam Talib (TNB Research, Malaysia)*	Mohd Aizam Talib
11:15	**A New Technology of GIS Partial Discharge Location Method Based on DFB Fiber Laser** *Long Li and Hua Yin (Chongqing Power Company, China); Wenbin Zhao and Chenglong Jia (Shanghai University of Electric Power, China)*	Chenglong Jia
11:30	**The Application of Magnetic Tape to Measure Lightning Peak Current in Indonesia** *Bryan Denov and Syarif Hidayat (Bandung Institute of Technology, Indonesia); Suwarno Suwarno (Institut Teknologi Bandung, Indonesia); Reynaldo Zoro (Bandung Institute of Technology, Indonesia)*	Bryan Denov
11:45	**Investigating Surface Condition of Corona Aged Epoxy-Al Nanocomposites by Adopting Wavelet Transform** *Myneni Sukesh Babu, Chillu Naresh and Rengaswamy Jayaganthan (Indian Institute of Technology Madras, India); Takahiro Imai (Toshiba Infrastructure*	Myneni Sukesh Babu

Systems & Solutions Corporation, Japan); Sarathi R (Indian Institute of Technology Madras, India)

13th July 2021 (Tuesday) Time: 10:00am – 12:00pm ORAL SESSION 8 Session Theme: Nanomaterial (NM-1) Chair: Muzamir Isa		Presenter
10:00	**Structure and Breakdown Properties of Polypropylene-Based Nanocomposites** *Aizat Azmi (Universiti Teknlogi Malaysia, Malaysia); Kwan Yiew Lau (Universiti Teknologi Malaysia, Malaysia); Noor Azlinda Ahmad (Institute of High Voltage & High Current, Universiti Teknologi Malaysia, Malaysia); Zulkurnain Abdul-Malek (Universiti Teknologi Malaysia & Institute of High Voltage and High Current, Malaysia); Chee Wei Tan (Universiti Teknologi Malaysia, Malaysia); Kuan Yong Ching (University of Reading Malaysia, Malaysia)*	Aizat Azmi
10:15	**Comparison of Flashover Voltages and Surface Discharges of Epoxy Resin with Montmorillonite Nanofillers and XLPE Samples with SiO2 and Al2O3 Nanoparticles** *Dimosthenis Verginadis and Michael G. Danikas (Democritus University of Thrace, Greece); Yi Yin (Shanghai Jiao Tong University, China); Ahmad Basri Abd Ghani (TNB Research, Malaysia); Sarathi R (Indian Institute of Technology Madras, India)*	Michael G. Danikas
10:30	**The Effect of Water Absorption on the Dielectric Response of Calcined Zirconia-Based Polyethylene Nanocomposites** *Nor Hidayah Rahim (Universiti Teknikal Malaysia Melaka, Malaysia); Kwan Yiew Lau and Chee Wei Tan (Universiti Teknologi Malaysia, Malaysia); Kuan Yong Ching (University of Reading Malaysia, Malaysia); Norin Hafizah Rahim (Universiti Teknologi MARA, Malaysia); Alun Vaughan (University of Southampton, United Kingdom (Great Britain))*	Kwan Yiew Lau
10:45	**Study on Thermal Conductivity of BNNs/Mg(OH)2/LDPE Composites Based on Melt Blending Method** *Chu Wang and Jinghao Wang (Xi'an Jiaotong University, China); Changshun Wu, Weigang Li and Zhaowen Yang (Xi'an Jiaotong-Zetastone Joint Innovation Research Center, China); Kai Wu (Xi'an Jiaotong University, China)*	Chu Wang
11:00	**Study of Heat Transfer Property of the Transformer Oils on Addition of CuO Nanoparticles** *Sujita Dey (Indian Institute of Technology, Guwahati, India); Rohith Sangineni (Indian Institute of Technology Guwahati, India); Niharika Baruah (Indian Institute of Technology, Guwahati, India); Sisir Kumar Nayak (Indian Institute of Technology Guwahati, India)*	Rohith Sangineni
11:15	**Effect of Titanium Oxide Nanofiller on the Electrical Properties of Polypropylene Nanocomposites for HVDC Insulation** *Muhammad Adnan; Zulkurnain Abdul-Malek; Kwan Yiew Lau; Muhammad Tahir (Universiti Teknologi Malaysia, Malaysia)*	Muhammad Adnan

11:30	**Study of Magnetic Properties of Mineral Oil Based Nanofluids** *Deepak Kanumuri (Indian Institute of Technology, Guwahati, India); Rohith Sangineni (Indian Institute of Technology Guwahati, India); Niharika Baruah (Indian Institute of Technology, Guwahati, India); Sisir Kumar Nayak (Indian Institute of Technology Guwahati, India)*	Deepak Kanumuri

13th July 2021 (Tuesday)
Time: 10:00am – 12:00pm
ORAL SESSION 9
Session Theme: Nanomaterial (DP-2)
Chair: Yanuar Zulardiansyah Arief

		Presenter
10:00	**Calculation of Electrospray Profile in Multi-Electrode System for Plasma Treatment** *Ryohei Ishimaru (Graduate School of Science and Engineering, Ehime University, Japan)*	Ryohei Ishimaru
10:15	**Polarity Effect of Large Current Spikes Produced by Artificial Charge Injection from Gas Phase into LDPE Sheet** *Keisuke Yamamoto (Graduate School of Science and Engineering, Ehime University, Japan)*	Keisuke Yamamoto
10:30	**Additive Impact on Space Charge of XLPE-Based Insulators Subjected to Radio-Chemical Aging** *Simone Suraci and Davide Fabiani (University of Bologna, Italy)*	Simone Suraci
10:45	**Design of an Ultra-Wide Band Microstrip Patch Antenna for Partial Discharge Detection on Power Transformer** *Jean Pierre Uwiringiyimana, Umar Khayam and Suwarno Suwarno (Institut Teknologi Bandung, Indonesia)*	Jean Pierre Uwiringiyimana
11:00	**A Hybrid Method of Self Organizing Maps with Statistical Feature Extraction for Accurate and Efficient Partial Discharge Recognition and Clustering** *Zul Hasrizal Bohari (Universiti Teknikal Malaysia Melaka, Malaysia); Muzamir Isa (Universiti Malaysia Perlis & UniMAP, Malaysia); Ping Jack Soh (Universiti Malaysia Perlis (UniMAP) & Katholieke Universiteit Leuven, Malaysia); Ahmad Zaidi Abdullah (Universiti Malaysia Perlis, Malaysia); Mohamad Fani Sulaima (Universiti Teknikal Malaysia Melaka, Malaysia); Mohamad Naim Mohd Nasir (Universiti Teknikal Malaysia, Melaka, Malaysia)*	Zul Hasrizal Bohari
11:15	**Air Bubble in Liquid Food Under Pulsed Electric Field Pasteurization Using Coaxial Chamber** *Rai Naveed Arshad (Institute of High Voltage and High Current, Pakistan)*	Rai Naveed Arshad

13th July 2021 (Tuesday)
Time: 14:00 – 16:00pm
ORAL SESSION 10
Session Theme: Condition Monitoring (CM-5)
Chair: Zuraimy Adzis

		Presenter
14:00	Classification of Salt Fog Aged Silicone Rubber Micro Nanocomposites Through PCA Assisted LIBS *Chillu Naresh (Indian Institute of Technology Madras, India); Pabbati Vinod (Indian Institute of Technology, Madras, India); Rengaswamy Jayaganthan (Indian Institute of Technology Madras, India); Stefan Kornhuber (Hochschule Zittau/Görlitz, Germany); Sarathi R (Indian Institute of Technology Madras, India)*	Chillu Naresh
14:15	Physicochemical Characteristics and Basic Properties of the Fluorinated BOPP Surface Layer and Its Effect on Dielectric Strength *Xin Wang, Zhenlian An and Yanming Qin (Tongji University, China)*	Zhenlian An
14:30	Effect of the Interphase and Agglomeration on the Tensile Properties of Epoxy/Alumina Nanocomposites *Neel Mani (IIT MADRAS, India); Hisayuki Suematsu (Extreme Energy-Density Research Institute Nagaoka University of Technology, Japan); Ramanujam Sarathi (IIT Madras, India); Toshikatsu Tanaka (Waseda University, Japan)*	Neel Mani
14:45	Effect of Gamma-Ray Irradiation on the Electrical and Mechanical Properties of Epoxy/TiO2 Nanocomposite *Janjanam Naveen and S. k. Amizhtan (Indian Institute of Technology, IIT Madras, India); Michael G. Danikas (Democritus University of Thrace, Greece); Takahiro Imai (Toshiba Infrastructure Systems &amp, Solutions Corporation, Japan); Ramanujam Sarathi (IIT Madras, India)*	Janjanam Naveen
15:00	Understanding the Flow Electrification of Synthetic Ester Oil Adopting Spinning Disc Method *S. k. Amizhtan (Indian Institute of Technology, IIT Madras, India); B Thangabalan and Ramanujam Sarathi (IIT Madras, India)*	S. k. Amizhtan
15:15	Investigation of Transformer Oil Properties with Advanced Multidimensional Methods *Sebastian Schreiter (HTWK Leipzig, Germany); Holger Lohmeyer (ABB AG, Germany); Peter Werle (Leibniz Universität Hannover, Schering-Institute & Institut für Elektrische Energiesysteme, Fachgebiet Hochspannungstechnik und Asset Management, Schering-Institut, Germany)*	Sebastian Schreiter
15:30	Effect of UV Ageing on Thermo-Mechanical Properties of Ethylene-Vinyl Acetate Nanocomposite Encapsulant *Moumita Naskar (Central Power Research Institute, India)*	Moumita Naskar

13th July 2021 (Tuesday)
Time: 14:00 – 16:00pm
ORAL SESSION 11
Session Theme: Condition Monitoring (CM-6)
Chair: Mohamed Afendi Mohamed Piah

		Presenter
14:00	**Analysis of Surface Potential Decay and Charge Trap Characteristics of Water Diffused Silicone Rubber Nanocomposites** *B Thangabalan (IIT Madras, India); Janjanam Naveen (Indian Institute of Technology, IIT Madras, India); Michael G. Danikas (Democritus University of Thrace, Greece); Ramanujam Sarathi (IIT Madras, India)*	B Thangabalan
14:15	**Impact of Gamma Irradiation on Surface Potential and Thermo-Mechanical Properties of Epoxy Micro-Nanocomposites** *Pabbati Vinod (Indian Institute of Technology, Madras, India); Myneni Sukesh Babu (Indian Institute of Technology Madras, India); Michael G. Danikas (Democritus University of Thrace, Greece); Takahiro Imai (Toshiba Infrastructure Systems &amp, Solutions Corporation, Japan); Sarathi R (Indian Institute of Technology Madras, India)*	Pabbati Vinod
14:30	**IDC Sensor for Monitor Ageing of Power Cable - Simulation** *George Chen (University of Southampton, United Kingdom (Great Britain))*	George Chen
14:45	**Thermal Degradation Kinetics of High Temperature Polymers for Aeronautic Cables Insulation** *Gilbert Teyssedre (LAPLACE, CNRS, Paul Sabatier University, France); Sorin Dinculescu (LAPLACE, France); Séverine Le Roy (CNRS, France); Thomas Hahner, Clara Lagomarsini and Patrick Rybski (Nexans France, France)*	Gilbert Teyssedre
15:00	**Integration of Duval Pentagon to the Multi-Method Interpretation to Improve the Accuracy of Dissolved Gas Analysis Technique** *Heri Sutikno (Bandung Institute of Technology, Indonesia); Rahman Azis Prasojo (Politeknik Negeri Malang, Indonesia); Dr Suwarno (Institut Teknologi Bandung, Indonesia)*	Heri Sutikno
15:15	**Study on the Ageing Performance on Kenaf Insulating Presspaper with Natural Ester** *Nurul Izzati Hashim (Universiti Malaysia Sarawak, Malaysia); Mohd Ishak; Nurizah Md Noh; Adnan Jaafar; Mohd Solehin Mohd Nasir; Siti Aminah Mohd Noor (Universiti Pertahanan Nasional Malaysia)*	Nurul Izzati Hashim
15:30	**Identification and Classification of Incipient Discharges in GIS Adopting Machine Learning Techniques** *Sneha Jayaganthan (Indian Institute of Technology Goa, India); Nagaraju Guvvala and Sarathi R (Indian Institute of Technology Madras, India)*	Sneha Jayaganthan

13th July 2021 (Tuesday)
Time: 14:00 – 16:00pm
ORAL SESSION 12
Session Theme: Electrical Insulation (EI-1)
Chair: Mohd Hafizi Ahmad

		Presenter
14:00	New Thermoplastic Insulation for Track-Resistant Overhead Cables with Improved Properties *Detlef Wald (Eifelkabel, Switzerland); Pasi Raikisto (HV Cable Solutions Oy, Finland)*	Detlef Wald
14:15	Curing Characteristic Analysis and Leakage Current Performances of Silicone Rubber via Inclined Plane Tracking (IPT) Test *Nornazurah Nazir Ali and Hidayat Zainuddin (Universiti Teknikal Malaysia Melaka, Malaysia); Jeefferie Abd Razak (Universiti Teknologi PETRONAS & Universiti Teknikal Malaysia Melaka, Malaysia); Rahisham Abd. Rahman (Universiti Tun Hussein Onn, Malaysia)*	Nornazurah Nazir Ali
14:30	Electric Field Distribution Considering the Byproducts Inhomogeneity of Crosslinking Insulation in HVDC Cable *Li Fei (Xi'an Jiaotong University, China); Lisheng Zhong (Xi'an Jiaotong University, China); Gao Jinghui, Li Wenpeng, Wang Cong and Tao Hexiang (Xi'an Jiaotong University, China); Qinxue Yu (Xi'an Jiaotong University, China); Feng Chao and Li Qingwu (Xi'an Jiaotong University, China)*	Li Fei
14:45	Charging and Discharging Current in Characterization of Kraft Paper Immersed in Palm Fatty Acid Ester Insulation Oil *Mohd Khairulanwar Mohmad Johar (School of Electrical and Electronics, University Sains Malaysia, Malaysia); Nor Asiah Muhamad, Mohamad Kamarol Mohd Jamil and Saiful Mohammad Iezham Suhaimi (Universiti Sains Malaysia, Malaysia)*	Saiful Mohammad Iezham Suhaimi

TECHNICAL PROGRAM – DAY 3

14th July 2021 (Wednesday)
Time: 10:00am – 12:00pm
ORAL SESSION 13
Session Theme: Condition Monitoring (CM-7)
Chair: Mohd Fairouz Mohd Yousof

		Presenter
10:00	**Classification of Fault and Stray Gassing in Transformer Oil Using SVM, NB and KNN Algorithms** *Hussein Hasan Al-Katheri and Mohd Fairouz Mohd Yousof (Universiti Tun Hussein Onn Malaysia, Malaysia); Hazlee Azil Illias (University of Malaya, Malaysia); Mohd Aizam Talib (TNB Research, Malaysia)*	Mohd Fairouz Mohd Yousof
10:15	**Electrical Equivalent Circuit Simulation of Polluted RTV Silicone Rubber Coated Insulator Under Salt Fog Condition** *Muhammad Fathur Majid, Adjie Bagaskara, Lunnetta Safura Lumba and Suwarno Suwarno (Institut Teknologi Bandung, Indonesia)*	Muhammad Fathur Majid
10:30	**Characterization of Thermal Degradation of Glass Fiber Reinforced Polymer Used in High Voltage Composite Insulator in Nitrogen Atmosphere by FTIR and Micro-Morphology Analyses** *Yanfeng Gao (Tsinghua University, China)*	Yanfeng Gao
10:45	**Electromagnetic Fields Characteristics from Overhead Lines, Underground Cables and Transformers Determined Using Finite Element Method** *Mohammed Khaled Omar Basharahil (Universiti Teknologi Malaysia & Sabson Energy, Malaysia)*	Mohammed Khaled Omar Basharahil
11:00	**Comparative Study on Electrical Equivalent Circuit of Insulators with and Without RTV Silicone Rubber Coating Under Clean Fog Condition Based on Leakage Current Waveforms** *Adjie Bagaskara, Muhammad Fathur Majid, Lunnetta Safura Lumba and Suwarno Suwarno (Institut Teknologi Bandung, Indonesia)*	Adjie Bagaskara
11:15	**FRA Indicator Limit for Faulty Winding Assessment in Rotating Machine** *Mohd Fairouz Mohd Yousof (Universiti Tun Hussein Onn Malaysia, Malaysia); Salem Mgammal Al-Ameri (Faculty of Electrical & Electronics Engineering, University Tun Hussein Onn Malaysia, Malaysia); Ahmed Allawy Alawady (Universiti Tun Hussein Onn Malaysia & The Islamic University, Najaf, Malaysia); Norhafiz Azis (Universiti Putra Malaysia & Centre for Electromagnetic and Lightning Protection Research, UPM, Malaysia); Hazlee Azil Illias (University of Malaya, Malaysia)*	Mohd Fairouz Mohd Yousof
11:30	**Evaluation of the Impact of Initial Thermal Aging on the Performances of the Methyl Ester/Paper Composite Insulation** *Gerard Ombick Boyekong (University of Douala, Cameroon)*	Gerard Ombick Boyekong

14th July 2021 (Wednesday)
Time: 10:00am – 12:00pm
ORAL SESSION 14
Session Theme: Nanomaterial (NM-2)
Chair: Mohd Taufiq Ishak

		Presenter
10:00	**Effect of Graphene Nanoplatelets (GNP) on the Dielectric and Thermal Properties of Polystyrene (PS)/Polyvinylidenedifluoride (PVDF) Blends** *N. Ajith Kumar (Central Power Research Institute, Bangalore, India); V. Ravibabu (CPRI Bangalore, India); A. Ashokbabu and P. Thomas (Central Power Research Institute, Bangalore, India)*	N. Ajith Kumar
10:15	**Development of Flexible Sensors Based on Piezoelectric Nanofibers** *Giacomo Selleri, Davide Fabiani, Andrea Zucchelli, Tommaso Brugo, Filippo Grolli and Lorenzo Bordoni (University of Bologna, Italy)*	Giacomo Selleri
10:30	**Electric Field Distribution in Power Cable with Nano and Micro Filler with High and Low Permittivity** *Samer Saeed Wahdain (University Malaysia Pahang (UMP), Malaysia); Amir Izzani Mohamed (Universiti Malaysia Pahang, Malaysia); Hazlee Azil Illias (University of Malaya, Malaysia); Mohamad Kamarol Mohd Jamil (Universiti Sains Malaysia, Malaysia)*	Samer Wahdain
10:45	**Effect of Trap Property on Charge Transport Parameters of BaTiO3/Polyimide Nanocomposites** *Jiasheng Ru (Xi'an Jiaotong University, China); Daomin Min (Xi'an Jiaotong University & Waseda University, Japan); Shengtao Li (Xi'an Jiaotong University, China); George Chen (University of Southampton, United Kingdom (Great Britain))*	Jiasheng Ru
11:00	**Partial Discharge and Breakdown Strength Diagnostics on Cross-Linked Polyethylene Nanocomposites Filled with Nano-Silica Powder** *Norhafezaidi Mat Saman (Institute of High Voltage & High Current, Malaysia); Mohd Hafizi Ahmad and Zolkafle Buntat (Universiti Teknologi Malaysia, Malaysia); Zainuddin Nawawi (Universitas Sriwijaya, Indonesia); Muhammad Abu Bakar Sidik (Faculty of Engineering, Universitas Sriwijaya Ogan Ilir, Indonesia); Muhammad Irfan Jambak (Faculty of Engineering, Universitas Sriwijaya Ogan Ilir, Malaysia)*	Norhafezaidi Mat Saman
11:15	**Investigation of BaTiO3 and TiO2 Based Nano-Fillers on the Space Charge and Electrical Strength of Cross-Linked Polyethylene (XLPE)** *Ahmad Basysar Abd Rahman (Universiti Tenaga Nasional, Malaysia); Muhamad Safwan Abd Rahman (University Tenaga Nasional, Malaysia); Azrul Mohd Ariffin (Universiti Tenaga Nasional, Malaysia); Nik Hakimi Nik Ali (Universiti Teknologi MARA & Shah Alam, Selangor, Malaysia); Ahmad Basri Abd Ghani (TNB Research, Malaysia); Kwan Yiew Lau and Mohamad Syahrin Mohamad (Universiti Teknologi Malaysia, Malaysia); Miszaina Osman (Universiti Tenaga Nasional, Malaysia)*	Muhamad Safwan Abd Rahman
11:30	**Influence of SiO2 and ZrO2 Nanocomposite on the AC Breakdown Strength of Cross-Linked Polyethylene (XLPE)** *Ahmad Basysar Abd Rahman (Universiti Tenaga Nasional, Malaysia); Muhamad Safwan Abd Rahman (University Tenaga Nasional, Malaysia); Azrul Mohd Ariffin (Universiti Tenaga Nasional, Malaysia); Nik Hakimi Nik Ali (Universiti Teknologi MARA & Shah Alam, Selangor, Malaysia); Ahmad Basri Abd Ghani (TNB Research, Malaysia); Kwan Yiew Lau and Mohamad Syahrin Mohamad (Universiti Teknologi Malaysia, Malaysia); Miszaina Osman (Universiti Tenaga Nasional, Malaysia)*	Muhamad Safwan Abd Rahman

11:45	Effect of Calcination and Addition of Surfactant on Morphological and Mechanical Properties of Silicone Nanocomposites *Khadija Kanwal Khanum, Arathi Mohan Sharma and Shesha Jayaram (University of Waterloo, Canada)*	Khadija Kanwal Khanum

14th July 2021 (Wednesday) Time: 10:00am – 12:00pm ORAL SESSION 15 Session Theme: Electrical Insulation (EI-2) Chair: Hazlee Azil Illias		Presenter
10:00	Simulation Analysis and Improvement Design of Electric Field Distribution for Shielding Device in UHV Converter Station Indoor DC Yard *Zichen Zhao, Zehua Wu and Zongren Peng (Xi'an Jiaotong University, China); Peng Liu (State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, China)*	Zichen Zhao
10:15	Electric Field Calculation and Optimization of PLC Reactor in UHV Indoor DC Yard *Yiyu Guo (Xi'an Jiaotong University, China)*	Yiyu Guo
10:30	Research on the Optimization of Grounding Methods and Power Loss Reduction Based on AC 500kV XLPE Submarine Cable Project *Xiao Du (Xi'an Jiaotong University & State Key Laboratory of Electrical Insulation and Power Equipment, China); Xuezhong Liu (Xi'an Jiaotong University, China)*	Xiao Du
10:45	Characteristics of Power Cable Sheathing Materials with Thermal Ageing *Arunjothi R (Central Power Research Institute, India)*	Arunjothi R
11:00	Corona Ring Design Impact on the Electric Field Distribution Surrounding an Insulator String *Hazlee Azil Illias, See Chean Yeoh and Yu Ling Liong (University of Malaya, Malaysia); Hazlie Mokhlis (University of MAlaya, Malaysia); Azrul Mohd Ariffin (Universiti Tenaga Nasional, Malaysia); Mohd Fairouz Mohd Yousof (Universiti Tun Hussein Onn Malaysia, Malaysia)*	Hazlee Azil Illias
11:15	Electric Field Distribution in HVDC Cable Joint in Non-Stationary Conditions *Gilbert Teyssedre (LAPLACE, CNRS, Paul Sabatier University, France); Thi Thu Nga Vu (Electric Power University, Hanoi, Vietnam); Séverine Le Roy (CNRS, France)*	Gilbert Teyssedre

14th July 2021 (Wednesday)
Time: 14:00 – 16:00pm
ORAL SESSION 16
Session Theme: Condition Monitoring (CM-8)
Chair: Norhafiz Azis

		Presenter
14:00	**Ageing Classification of Metal Oxide Surge Arrester Using Its Power Factor** *Abdullah Munir (University of Technology Malaysia, Malaysia); Zulkurnain Abdul-Malek (Universiti Teknologi Malaysia & Institute of High Voltage and High Current, Malaysia)*	Abdullah Munir
14:15	**Hydrophobicity and Surface Microstructure Changing Regulations of HTV Silicone Rubber Under Corona Accelerated Aging** *Ya'nan Peng, Chenxu Wang and Guanjun Zhang (Xi'an Jiaotong University, China)*	Ya'nan Peng
14:30	**New Approach for Monitoring Contamination Level on Outdoor Insulator Based on Harmonics Components of the Leakage Current** *Ali Ahmed Ali Salem, Rahisham Abd. Rahman, Nor Akmal Mohd Jamail and Nordiana Azlin Othman (University Tun Hussien Onn Malaysia, Malaysia); Irshad Ullah (CECOS University, Pakistan); Hafisoh Ahmad (Taylors University, Malaysia)*	Rahisham Abd. Rahman
14:45	**Effect of Thermal Aging on Direct Current Integrated Charge Characteristics of XLPE Cable Insulation** *Hui Qi, Xinjun Zhang, Rushan Wang, Zhenghong Xu and Qi Wu (State Grid Taixing Power Supply Company, China); Heyu Wang and Zhonglei Li (Tianjin University, China)*	Heyu Wang
15:00	**Analysis of Direct Current Integrated Charge in Cable Insulation with Electrical Tree** *Hui Qi, Xinjun Zhang, Rushan Wang, Zhenghong Xu and Wenquan Gu (State Grid Taixing Power Supply Company, China); Yufei Yao and Zhonglei Li (Tianjin University, China)*	Yufei Yao
15:15	**Aging of Oil-Impregnated Paper at Different Frequencies** *Mohamad Ghaffarian Niasar and Weichuan Zhao (Technical University of Delft, The Netherlands)*	Weichuan Zhao
15:30	**Polarization and Depolarization Current Analysis for Field Degraded Cross Linked Polyethylene Cables** *Suhaila Sulaiman, Azrul Mohd Ariffin, Tze Mei Kuan and Miszaina Osman (Universiti Tenaga Nasional, Malaysia); Nik Hakimi Nik Ali (Universiti Teknologi MARA & Shah Alam, Selangor, Malaysia); Hazlee Azil Illias (University of Malaya, Malaysia)*	Suhaila Sulaiman

14th July 2021 (Wednesday)
Time: 14:00 – 16:00pm
ORAL SESSION 17
Session Theme: Electrical Insulation (EI-3)
Chair: Azrul Mohd Ariffin

		Presenter
14:00	**Measuring Thermal Diffusivity of Thin Films in Thickness Direction** *Shijie Chen, Feihu Zheng and Chenyu Huang (Tongji University, China); Yewen Zhang (Tongi University, China)*	Shijie Chen
14:15	**Study of High Voltage Connectors for Coaxial Cables Used in Kicker Applications at CERN** *Dimitrios Kontelis, Laurent Ducimetiere, Thomas Kramer, Luc Sermeus and Tobias Stadlbauer (CERN, Switzerland)*	Dimitrios Kontelis
14:30	**The Electric Field Characteristics in Clevis Type Polymer Insulators Affected by Size and Contact Angle of the Contaminants: Simulation Approach** *I Made Yulistya Negara (ITS, Indonesia); I Gusti Ngurah Satriyadi (Institut Teknologi Sepuluh Nopember, Indonesia); Dimas Anton Asfani (INSTITUT TEKNOLOGI SEPULUH NOPEMBER, Indonesia); Daniar Fahmi, Arief Ksatria and Namira Jannah (Institut Teknologi Sepuluh Nopember, Indonesia)*	I Made Yulistya Negara
14:45	**DC Leakage Current Measurements: Contribution for the Qualification of Extruded MVAC Cables for DC Operation** *Patrik Ratheiser and Uwe Schichler (Technische Universität Graz, Austria)*	Patrik Ratheiser
15:00	**Effect of Compounding Process Parameters Selection on Conductivity Level of Polymer Blends with Aluminium Oxide as Nanofiller for HVDC Cable Application** *Syatirah Mohd Noor (Universiti Sains Malaysia & Universiti Malaysia Perlis, Malaysia); Nor Asiah Muhamad and Mohamad Kamarol Mohd Jamil (Universiti Sains Malaysia, Malaysia)*	Syatirah Mohd Noor

14th July 2021 (Wednesday)
Time: 14:00 – 16:00pm
ORAL SESSION 18
Session Theme: Dielectric Phenomena (DP-3)
Chair: Nik Hakimi Nik Ali

		Presenter
14:00	**Analysis of Permittivity and Temperature on Charge Accumulation Within Cross-Linked Polyethylene (XLPE) via Numerical Simulation** *Nik Hakimi Nik Ali (Universiti Teknologi MARA & Shah Alam, Selangor, Malaysia); Azrul Mohd Ariffin (Universiti Tenaga Nasional, Malaysia); Muhamad Safwan Abd Rahman (University Tenaga Nasional, Malaysia); Miszaina Osman (Universiti Tenaga Nasional, Malaysia); Nur Hazirah Zaini (Faculty of Engineering and Built Environment, Universiti Sains Islam Malaysia, Malaysia); Norhidayu Rameli (Universiti Sains Islam Malaysia, Malaysia)*	Nik Hakimi Nik Ali
14:15	**Dielectric Barrier Discharge Based Diesel Exhaust Treatment for THC Removal Through Plasma Catalysis** *Katam Nishanth and Bs Rajanikanth (Indian Institute of Science, India)*	Katam Nishanth

14:30	Investigation on Partial Discharge Localization in Oil Based on Time of Arrival Method *Ahmad Hafiz Mohd Hashim (German-Malaysian Institute & University Putra Malaysia, Malaysia); Norhafiz Azis (Universiti Putra Malaysia & Centre for Electromagnetic and Lightning Protection Research, UPM, Malaysia); Jasronita Jasni and Mohd Amran Mohd Radzi (Universiti Putra Malaysia, Malaysia); Masahiro Kozako (Kyusyu Institute of Technology, Japan); Mohamad Kamarol Mohd Jamil (Universiti Sains Malaysia, Malaysia)*	Ahmad Hafiz Mohd Hashim
14:45	Defects and Resistance Degradation of Sputtered Doped Lead Zirconate Titanate Thin Films *Kuan-Ting Ho and Daniel Monteiro Diniz Reis (Robert Bosch GmbH, Germany); Karla Hiller (Chemnitz University of Technology, Germany)*	Kuan-Ting Ho
15:00	Research on a New Optical Method for Space Charge Measurement of Insulating Materials *Hanwen Ren, Qingmin Li, Haoyu Gao, Sihong Cheng and Yunzhen Shi (North China Electric Power University, China); Zhongdong Wang (The University of Manchester, China)*	Hanwen Ren

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