2017 INTERNATIONAL SYMPOSIUM ON ELECTRICAL INSULATING MATERIALS

September 11-15, 2017, Toyohashi City, Japan

Sponsored by

IEEJ Technical Committee on Dielectrics and Electrical Insulation

Technically Co-sponsored by

IEEE Dielectrics and Electrical Insulation Society
IEEE DEIS Japan Chapter

Supported by

The Obayashi Foundation
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Final Program

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Members:	N. Hozumi, T. Kawashima (Toyohashi University of Technology)

Workshop "Advanced Nanodielectrics"

Chair:	T. Tanaka (Waseda Univ.)
Assistant Coordinator:	T. Imai (Toshiba Co.)

Demonstration of Measurement and Diagnostic Equipment

Event Director:	Y. Murakami (Toyohashi Univ. Tech.)
Event Assistant Director:	Y. Hayase (Fuji Electric)

Conference Information

ISEIM 2017 will be held in Toyohashi, Japan on September 11-15, 2017. The previous conferences were held in Tokyo (1995), Toyohashi (1998), Himeji (2001), Kitakyushu (2005), Yokkaichi (2008), Kyoto (2011) and Niigata (2014), all in Japan. The organizing committee cordially invites you to participate in the conference.

About Toyohashi

Toyohashi City is in a continuous industrial area stretching from Tokyo to Osaka, as many prehistoric monuments and archaeological traces of different ages can be seen. The city is in a prominent agriculture area, blessed with a warm climate. Visitors can enjoy Japanese traditional cuisine, such as sake and processed seafood product *chikuwa*. The conference venue Toyohashi Chamber of Commerce & Industry is located just five minutes on foot from the railway station.

Toyohashi City is located at the east side of Aichi Prefecture, and is serviced by Tokaido Shinkansen (Bullet Trains) and also has an international airport. Most people visiting will opt to take the bullet train with its category 'Hikari' from Tokyo Station to Toyohashi, a journey of around 90 minutes. Visitors from overseas will land at Narita Airport (NRT), 60 km from downtown Tokyo. The easiest way to get to Tokyo Station, for onward transfer to Toyohashi, is by using Narita Express train service Narita Express runs every 30 minutes during peak periods and takes under one hour to reach Tokyo Station. There are several other ways to access to Toyohashi, such as to use Haneda (HND), Osaka Kansai (KIX), and Negoya Central (NGO) Airports. Bullet trains from Shin-Osaka station also needs around 90 minutes to get to the venue.

Main Topics

1. Space charge, surface and interfacial phenomena
2. Electrical properties of dielectrics and measurement and testing techniques
3. Nanotechnology for dielectrics
4. Inorganic and functional dielectric materials
5. Organic thin films and electronics
6. Dielectric materials for electronics and telecommunication
7. Dielectric properties of biological objects, biodielectronics
8. Inverter Surges
9. Partial discharge
10. Asset management for dielectrics applied apparatus
11. Insulation design, reliability, aging and degradation, their detection and monitoring
12. Polymeric insulators and outdoor insulation
13. Eco-friendly dielectric materials and recycling
14. Electrical insulation phenomena and charging under cosmic and radiological environment
15. Collaborate work with industries and universities

Papers on the following topics are particularly welcome: polymeric insulators and outdoor insulation, space charge

measurements, on-line monitoring and diagnostics of power apparatus, GIS and cables, diagnosis of GIS, dc cables, development of polymeric cables and joints for higher electric fields, organic and inorganic thin films, new and functional materials including biological and medical dielectrics, and ferroelectric materials.

Workshop "Advanced Nanodielectrics"

An English book entitled "Advanced Nanodielectrics – Fundamentals and Applications –" is now to be published. The book is edited by the Investigating R&D Committee on Advanced Polymer Nanocomposite Dielectrics (Chair: Prof. T. Tanaka, 2010-2013), and it is composed of the investigations by noted Japanese expert committee members. Since it is edited carefully for easy-to-understand even for beginners, it must be helpful for the researchers in this field. The organizing committee of ISEIM 2017 plans an event to introduce you the new book, prior to the symposium, by inviting some authors of the book. They will present you the fundamentals and applications about advanced nanodielectrics in this workshop.

Note: audiences who want to take part in this program are needed to apply through the registration system.

Special Sessions for Development of Electrical Insulation Evaluation of Inverter-Fed Motors for the IEC Standardizations

Recent progress of rotating electrical machines fed from voltage converters may face with risk of electrical insulation failure due to high-voltage, high-repetition pulses with short rise time of so-called "inverter-surge." The investigating R&D committee in IEEJ that consists of experts in the related research fields including hybrid and electric vehicles from not only academic institutes but also industrial companies in Japan has been established in order to investigate partial discharge (PD) that potentially damages the insulation system and its qualification of random-wound motors based on IEC 60034-18-41. In particular, round-robin test (RRT) of repetitive PD inception voltage (RPDIV) measurements on complete winding of random-wound motor has clarified the statistical properties of RPDIV data obtained at independent laboratories and the significant impact of ambient humidity on RPDIV. The organizing committee is planning to introduce at this special session the digest report of the activities in the R&D committee. We will also provide an opportunity to demonstrate RPDIV measurements using the test equipment used in the RRT.

Special Session for APIANS - Analysis for Polymeric Insulating Materials Using Advanced Numerical Simulation

After the successful workshop named "APIANS" in the last ISEIM, many presentations related to this theme have been reported by many authors in various conferences. Since the organizing committee would like to accelerate the activity in this research field, a special session for this theme is proposed in the symposium. The session is supposed to be composed of presentations by one or two invited and other general oral speakers.

MVP (Mutual Visiting type Poster) Session

This session aims to encourage and improve the presentation and discussion abilities of attendees, and give a chance to discuss other poster presentations. Attendees are required to present their poster not only to the attendees who do not present in the session but also to the other presenters of the session. All the attendees of the MVP session

that is all the presenters of the MVP session have rights of voting the good presentation, definite replay in discussion, and beautiful poster. The excellent presenter(s) will be awarded in the banquet.

SS (Industry) Session

TC-DEI has held Sun-shine (industry) session in the previous domestic and international symposiums. They were very received very well and many Japanese companies in this field want to participate in the SS session. TC-DEI aims to make a good opportunity for companies to introduce their developed and developing technologies and products to attendee especially young researchers such as university students and graduate students. It must be a good opportunity to introduce your company.

Japan-Korea Young Researcher Exchange Program

Technical committees on dielectrics and electrical insulations both in Japan and Korea have started new exchange program for young researchers. Winners are selected from domestic annual conferences in both countries, and get a chance to have presentation under the financial aid. ISEIM and its base, SEEIMAS (Symposium on Electrical and Electronic Insulating Materials and Applications in Systems) have selected total three Japanese students to let them have presentation in Korean conference. We have also welcomed the same number of Korean students to introduce their research activities to Japanese participants. This year's Korean winner's presentation will be held in Oral M, Material Properties II Session in ISEIM 2017.

Language

The working language of the symposium is English. All printed matter will appear in English.

Registration Fee

Registration fee including is ¥35,000 (Japanese yen) for members of IEEJ, IEEE, CIGRE, CES, or KIEEME, ¥40,000 for non-members, and ¥15,000 for students with valid IDs. Manuscript submission fee is ¥10,000 per manuscript. This fee will be deducted from the registration fee for the authors presenting their papers, although the maximum deduction is ¥10,000 per attendee. Attendees having more than one paper should choose publication fee for the rest of the papers. Exception is only adopted if invited lecturers present by him/herself. Lecturers for Inuishi memorial, plenary, session invited, and Korea-Japan exchange program are the invited lecturers.

		Members [a)]	Non-Members
Mandatory registration	Normal registration [b)]	35,000 JPY	40,000 JPY
	Students [b, c)]	15,000 JPY	
	Registration only for the paper [d)]	10,000 JPY	
Options	Workshop Ticket w/ 'Nanobook' textbook [e)]	14,500 JPY	
	Workshop Ticket w/o 'Nanobook' textbook	3,000 JPY	
	Technical Tour Ticket	1,000 JPY	
More options	Banquet Ticket for Accompanying Person	5,000 JPY	
	Proceedings booklet	5,000 JPY	

[a] Members of IEEJ, IEEE, CIGRE, CES, or KIEEME.

[b] Services will be transferred as a set of a USB stick, a banquet ticket, some conference kits and other services at the conference. Note that proceeding booklet is not included. Due date of service transfer: At the conference (Jun. 1, 2014 - Jun. 5, 2014). Receipt is issued at the registration desk.

[c] This includes booklet and USB stick of the symposium proceedings, one ticket for banquet.

[d] This is for authors who do not attend the symposium. IMPORTANT: papers neither registered nor paid the publication fee will be deleted from the symposium proceedings, and also will not disclosed on IEEE Xplore.

[e] An English book entitled "Advanced Nanodielectrics - Fundamentals and Applications -", published from Pan Stanford Publishing, included in this ticket with a special 30% discount than usual price.

Technical tour #1: Hamamatsu Photonics

Departure: Sept. 15th (Fri.) 12:30 at Toyohashi Station

Return: Sept. 15th (Fri.) ~18:00 at Toyohashi Station

Occupancy load limit: 30 passengers

Hamamatsu Photonics is a Japanese manufacturer especially famous for optical sensors including photomultiplier tubes (PMTs) and light sources. The tour will go to Toyooka Factory which has Electron Tube Division for PMT produce. PMTs are common devices for engineering and scientific use, but it the one made in this factory is especially famous for the special usage design for the Super-Kamiokande neutrino detector facility at the University of Tokyo where 2015 Nobel Prize Laureate Takaaki Kajita conducted his research.

Technical tour #2: Honda Electronics and TUT Hozumi Lab.

Departure: Sept. 15th (Fri.) 12:30 at Toyohashi Station

Return: Sept. 15th (Fri.) ~18:00 at Toyohashi Station

Honda Electronics has developed ultrasonic technology since the release of the world-first transistor fishfinder in 1956. Their recent products vary in several industrial field from the factory usage to marine, medical, and ceramics field. Prof. Hozumi is honorary chair of ISEIM 2017, and his laboratory in Toyohashi University of Technology develops new measurement techniques based on electrical engineering, and proposes applications to electrical and medical field. They design and assemble measurement equipments. Information processes like signal processing and image processing are carried out as well.

The tour also goes to *Futagawa-syuku Honjin* Museum. *Futagawa-syuku* was the thirty-third of the fifty-three stations of the *Tokaido*, which was one of the most important of the routes in Edo era to connect Kyoto and Tokyo. This station town with the main street of about 1.3 km long recorded 1289 population in this era, thanks to the existence of an officially appointed inn called *Honjin* for the feudal lords (*Daimyo*). Even today structure of ancient town and some old houses can still be seen along this section of the road.

Digest Reports from Investing R&D Committees

The TC-DEI in IEEJ runs investigating R&D committees that organize several technical meetings a year. Their roles are to survey trends in basic and applied insulating technology broadly both in Japan and overseas, and to scientifically classify the technological needs shared by various areas of new technology development as well as the

problems involved. The booklet of ISEIM 2017 proceedings includes digest results of these efforts.

ISEIM 2017 Web Site

http://www2.iee.or.jp/~adei/ISEIM2017/

IEEE DEIS summer school (three days)

Departure: Sept. 15th (Fri.) 9:00 at Toyohashi Station

Return: Sept. 17th (Sun.) ~15:00 at Toyohashi Station

Participant limit: 40 PhD student, an MSc student with some research experience or in the first three years of your career.

Venue: Cape Irago

To promote scientific debate between junior researchers in the field of electrical insulation and dielectrics, IEEE DEIS in collaboration with IEE Japan organize the 3rd Summer School on Dielectric Interfaces. In the quiet seaside location of Cape Irago, not far from Toyohashi, a group of 40 junior researchers / PhD students will take part in a 3-day brainstorm on three related hot topics in dielectrics research. For the September 2017 Summer School, the topics are all related to Dielectric Interfaces:

a) Interfacial phenomena at nano scale - taking the explanation of structure-property relations one step further

b) Increasing the heat transport in solid dielectrics

c) How to obtain objective measures of the size of interfacial zones and the quality of dispersion and distribution in nanocomposites

The Way of Presentation

All papers accepted for ISEIM 2017 must be presented at the Conference. Papers will be presented in poster, MVP, or oral sessions.

Oral sessions: Presentations must be concise and to the point. The length of your oral presentation must be less than *20 minutes, including discussion and change of presentation*. This is also the case for the Japan-Korea exchange program presentation. Presentations nominated as in-session invited talk have *25 minutes* including discussion and change of presentation. Your presentation material should be prepared in Microsoft PowerPoint or Adobe PDF and are required to transfer to the computer set at the presentation room until the day before your presentation.

If you do not want to submit your presentation material on ahead of your session and you want to give your presentation with your computer, please consult to the chairperson. *Please note that the secretariat only prepare the RGB video-out terminals. We do not have any terminals for other terminations such as HDMI. Authors are required to prepare conversion adapter by themselves.*

Poster sessions: Your poster should attract the viewer's attention and suggest the scope of the work and the most important results. Avoid unnecessary details. The fine points of the research can be developed during one-on-one discussions. Authors are encouraged to devise presentations that are best suited to the work and are given considerable latitude in the presentation of their results.

Poster boards are provided during the session. Its size is *a height of approx. 2.0 m and a width of 0.9 m*. 'A-zero' size posters will be suitable. Adhesive tapes will be provided by the conference secretariat.

Schedule for #1 Session: 10:30 – 13:30, Sept. 13th: preparation
13:30 – 17:00, Sept. 13th: presentation
17:00 – 17:30, Sept. 13th: removing

Schedule for #2 Session: 9:00 – 10:30, Sept. 14th: preparation
10:40 – 15:00, Sept. 14th: presentation
15:00 – 15:30, Sept. 14th: removing

All the presentation materials remained at 8:30 a.m., Friday, Sept. 15th will be removed and disposed by the conference secretariat.

MVP sessions: "MVP" session is an abbreviation of "Mutual Visiting type Poster" session. This session aims to encourage and improve the presentation and discussion abilities of attendees, and give a chance to discuss other poster presentations. Attendees are required to present their poster not only to the attendees who do not present in the session but also to the other presenters. All the attendees of the MVP session, that is all the presenters of the MVP session have rights of voting the good presentation, definite replay in discussion, and beautiful poster. *The excellent presenter(s) will be awarded in the banquet.*

The program committee will explain how to execute the session and distribute the rating list at the beginning of the session. After that, attendees of the MVP session will explain their poster to the other attendees. The presentation time will be around 5 minutes excluding discussion. The discussion time will be 5 minutes following to the

explanation. During presentation and discussion, other attendees may mark the presentation, replay and understandability of poster. The rating list will be withdrawn after the MVP session and be made up.

In the MVP session, you are provided a poster board, which are completely the same as those in Poster session mentioned above. The size of your poster board is a height of approx. 2.0 m and a width of 0.9 m. 'A-zero' size posters will be suitable. Adhesive tapes will be provided by the conference secretariat.

The schedule of the preparation and removal of the MVP session is as follows;

Schedule for #1 Session: 10:30 – 13:30, Sept. 13th: preparation
14:00 – 17:00, Sept. 13th: presentation
17:00 – 17:30, Sept. 13th: removing

Schedule for #2 Session: 9:00 – 10:30, Sept. 14th: preparation
10:40 – 15:00, Sept. 14th: presentation
15:00 – 15:30, Sept. 14th: removing

All the presentation materials remained at 8:30 a.m., Friday, Sept. 15th will be removed and disposed by the conference secretariat.

The flow of the MVP session is as follows;

1. The flow of the MVP session is explained.
2. Presenters of the MVP session will be grouped into several groups. One group has 6 to 7 presenters. Note: the grouping has finished and your group number is shown on the program on the conference web site. At the opening of the MVP session, the grouping will be confirmed. A group consists of the young researchers in as the similar field as possible.
3. All the presenter break into small groups confirmed, then you are required to give your poster presentation to the other member in your group. The presentation duration should be 5 minutes at most. After the presentation, the time is open for discussion. The other member in your group will give you some question, so please answer the question appropriately.
4. After your presentation, the other member in your group will give his/her poster presentation. The presenter will change in turn.
   Note: During the presentation and discussion, the other attendees may mark the presentation, replay and understandability of hit/her poster. The rating list will be withdrawn after the MVP session and be made up. *The excellent presenter(s) will be awarded in the conference banquet.*
5. The rating list will be collected by the Coordinator of the group.
6. Then, the coordinator will take his group to the SS session (Exhibition by companies). The presenter of the SS session will explain latest topics in their research and development. Some companies are planning to show you the actual measuring systems and some experimental specimen. As mentioned above, the presenter should give his/her presentation to about 6 or 7 researchers in the same time, although the presenter should give his/her presentation to only 1 or 2 researchers.

Here, please note that a coordinator will chair your group. The coordinator is basically Japanese university professors and Japanese company researchers. The aim of the coordinator plays roles of a time keeper, activation of the discussion, etc. like a session chair in an oral session. Thus, if you have any question about the MVP session on site, please ask to your coordinator.

Timetable

	Oral Room #1	Oral Room #2	Poster Room	Others
Sept. 11th (Mon.)		Workshop Advanced Nanodielectrics 14:00-17:00		
				Welcome Party, at the basement floor 'Yu-yu-jin' 18:00-20:00
Sept. 12th (Tue.)	Opening Address Inuishi Lecture 9:00-10:30			
	Coffee Break			
	Oral A Outdoor Insulation 10:40-12:05	Oral B Inorganic Materials 10:40-12:00		
	Lunch Break			
	Oral C Material Properties #1 13:00-14:45	Oral D Partial Discharge #1 13:00-14:45		
	Coffee Break			
	Oral E Degradation #1 15:20-17:25	Oral F Nanocomposite #1 15:20-17:35		
Sept. 13th (Wed.)	Plenary Lecture 9:00-10:20			
	Coffee Break			
	Special Oral SP1 Partial Discharge 10:40-12:10	Oral G Space Charge #1 10:40-12:05		
	Lunch Break			
		Oral H Partial Discharge #2 13:30-15:10	MVP and Poster session #1, as well as SS and Demo 13:30-17:00	
	Coffee Break			
		Oral I Nanocomposite #2 15:20-17:25		
Sept. 14th (Thu.)	Oral J Functional Materials 9:00-10:25	Special Oral SP2 APIANS 9:00-10:25		
	Coffee Break			
		Oral K Space Charge #2 10:40-12:05	MVP and Poster session #2, as well as SS and Demo 10:40-15:00	
	Lunch Break			
		Oral L Degradation #2 13:00-14:25		
	Oral M Material Properties #2 15:20-17:25	Oral N Measurement Techniques 15:20-17:20		
				Banquet at Hotel Arc Riche Toyohashi 5th floor, Room Grace 18:30-20:30
Sept. 15th (Fri.)				IEEE DEIS summer school (9:00-) Technical tour (12:30-)

Cells colored in pink: special application is required in addition to normal registration set.

Scientific Program

Mon. Sept. 11th

14:00 – 17:00 ***Workshop "Advanced Nanocomposites" (Oral Room #2, 4th floor)***

Chair: T. Tanaka (Waseda Univ)

(15:25 - 15:40 Short Break)

14:00 - 14:10 Opening

Yasuhiro Tanaka (Tokyo City Univ., Japan)

14:10 - 14:25 Applications Part I – Switchgears and Motor Windings

Takahiro Imai (Toshiba Co., Japan)

14:25 - 14:40 Applications Part II – Outdoor Insulations

Takanori Kondo (NGK Insulators, Ltd., Japan)

14:40 - 14:55 Applications Part III – Insulating Substrates and Electronic Devices

Takashi Ohta (Panasonic Co., Japan)

14:55 - 15:10 Applications Part IV – LSI and Power Electronics

Kenji Okamoto (Fuji Electric Co., Ltd., Japan)

15:10 - 15:25 Applications Part V – dc Power Cables

Yoshiyuki Inoue (Sumitomo Electric Industries, Ltd., Japan)

15:40 - 16:00 Fundamentals Part I – Space Charges

Yasuhiro Tanaka (Tokyo City Univ., Japan)

16:00 - 16:20 Fundamentals Part II – Permittivity, Water Tree, etc.

Muneaki Kurimoto (Nagoya Univ., Japan)

16:20 - 16:40 Fundamentals Part III – Electrical Teeing and Partial Discharges

Toshikatsu Tanaka (Waseda Univ., Japan)

16:40 - 17:00 Theoretical Aspects – Characterization, Computer Simulation, etc.

Masahiro Kozako (Kyusyu Inut. Tech., Japan)

17:00 - 17:10 Closing

Toshikatsu Tanaka (Waseda Univ., Japan)

13:00 – 17:30 ***Registration at 4th floor, in front of Workshop Room***

18:00 – 20:00 ***Welcome party (at Yu-yu-jin restaurant, basement floor of the conference venue)***

Tue. Sept. 12th

Invited Lecture (Oral Room #1, 9th floor)

9:00 - 9:10 ***Opening Address***

Yasuhiro Tanaka (Tokyo City Univ., Japan)

9:10 - 10:30 ***Inuishi Memorial Lecture*** ***Chair: Y. Tanaka (Tokyo City Univ.)***

Z1 [001] Energetics of Charge Transport in Insulating Polymers

Christian Laurent, Gilbert Teyssedre (Université de Toulouse, LAPLACE, France)

10:40 - 12:05 ***Session A: Outdoor Insulation (Oral Room #1, 9th floor)***

Chair: G. Teyssedre (Univ. Toulouse)

A1 (SI) [187] Evaluation of the Influence of Low Molecular Weight Components to the Retention of the Hydrophobicity of Silicones by Using the Dynamic Drop Test.

Stefan Kornhuber, Jens Weber (University of Applied Science Zittau/Görlitz, Germany)

A2 [417] Effects of Tracking and Erosion Resistance of Nano-Boehmite Added Silicone Rubber

Ryo Inoue[1], Takanori Kondo[1], Masahiro Kozako[2], Masayuki Hikita[2] ([1] NGK Insulators, Ltd., Japan, [2] Kyushu Institute of Technology, Japan)

A3 [376a] Influence of Environmental Factor on Hydrophobicity Transfer of Silicone Rubber Used for Outdoor Insulation

Yong Zhu[1, 2], Xiaorong Zhang[2], Jiang Fang[2] ([1] Taizhou University, China, [2] Jiangsu Shenma Electric Co. Ltd., China)

A4 [132a] Fluorination Mechanisms of Silicone Rubbers and Surface Properties

Fangting Shan, Zhenlian An, Xiaoxiao Gu, Ruochen Shen, Longkai Que, Feihu Zheng, Yewen Zhang (Tongji University, China)

10:40 - 12:00 ***Session B: Inroganic Materials (Oral Room #2, 4th floor)***

Chair: K. Okamoto (Fuji Electric, Co. Ltd.)

B1 [162] Preparation of DLC Films Using Microwave Plasma CVD in Open-Air

Shinji Yudate, Hideki Motomura, Hidetsugu Yagi, Kazunori Kadowaki (Ehime University, Japan)

B2 [045] Thermally Stimulated Depolarization Measurements in Alumina Based Ceramics

Peng Zhang[1], Liang Zhang[1], Chuang Zhang[1], Chun Zhao[1], Jianying Li[1], Haiyun Jin[1], Hao Zhang[2], Hongwei Zheng[3] ([1] Xi'an Jiaotong University, China, [2] Xi'an University of Architecture and Technology, China, [3] Jingdezhen Shenfei Special Ceramics Co., Ltd., China)

B3 [116] Dielectric Charging Model for Metal-Insulator-Metal Structures

Anne-Charlotte Amiaud[1], Aude Leuliet[1], Julien Nagle[1], Brigitte Loiseaux[1], Paolo Martins[1], Raphaël Aubry[1], Stéphane Holé[2] ([1] Thales Research & Technology, France, [2] LPEM – CNRS, Sorbonne Universités, UPMC, PSL Research University, ESPCI-Paris, France)

B4 [031] Insulation Performance of Atomic Hexogonal Boron Nitride Film under Ultra-high DC Electric Stress

Guodong Meng, Yonghong Cheng, Dujiao Zhang, Guanyu Zhang (Xi'an Jiaotong University, China)

12:00 – 13:00 ***Lunch Break***

13:00 – 14:45 ***Session C: Material Properties #1 (Oral Room #1, 9th floor)***

Chair: K. Kobayashi (Hitachi, Ltd.)

C1 [188] Terahertz Absorption Spectra of Antioxidants in Insulating Polymers

Takuya Kozai[1], Takuya Kaneko[1], Naoshi Hirai[2], Yoshimichi Ohki[1, 2] ([1] Department of Electrical Engineering and Bioscience, Waseda University, Japan, [2] Research Institute for Materials Science and Technology, Waseda University, Japan)

C2 [170] Kerr Optical Measurement of Electric Field Strength in Gelatinous Liquid

Haruo Ihori, Reo Sunouchi, Yusuke Tanaka, Jeon Hyeon-Gu, Masaharu Fujii (Ehime University, Japan)

C3 (SI) [270] Impact of Press-Molding Process on Chemical, Structural and Dielectric Properties of Insulating Polymers

Francesco Gullo[1], Christina Villeneuve-Faure[1], Séverine Le Roy[1], Christian Laurent[1], Gilbert Teyssèdre[1], Thomas Christen[2], Henrick Hillborg[3] ([1] LAPLACE, Université de Toulouse, CNRS, INPT, UPS, France, [2] ABB Corporate Research, Switzerland, [3] ABB Corporate Research, Sweden)

C4 [070] Current Distribution Measurement in Insulating Polymer Cross Section by Current Integration Meter

Masumi Fukuma[1], Yoitsu Sekiguchi[2] ([1] National Institute of Technology, Matsue College, Japan, [2] Sumitomo Electric Industries, Ltd., Japan)

C5 [180] Measurement of the Dielectric Permittivity of Powder Materials: A General Approach by Using Dielectrophoretic Forces

Guillaume Belijar[1], Zarel Valdez-Nava[1], Sombel Diaham[1], Lionel Laudebat[1, 2], Thierry Lebey[1] ([1] LAPLACE, Université de Toulouse, CNRS, INPT, UPS, France, [2] Institut National Universitaire Champollion, France)

13:00 - 14:45 ***Session D: Partial Discharge #1 (Oral Room #2, 4th floor)***

Chair: A. Cavallini (Univ. Bologna)

D1 (SI) [443] Understanding Corona Activity in Nanoparticles Dispersed Transformer Oil under Harmonic AC Voltages

Ramanujam Sarathi, Kumari Swati (Indian Institute of Technology Madras, India)

D2 [183] A Model to Determine the Probability Distribution of Partial Discharge Inception Voltage as a Function of the Voltage Waveform and of the Test Procedures

Andrea Cavallini[1], Luca Lusuardi[1], Peng Wang[2] ([1] University of Bologna, Italy, [2] Sichuan University, China)

D3 [141] Sinusoidal-wave Applied Voltage Frequency Dependence of Partial Discharge Characteristics with Needle-plane Electrode System

Takafumi Mashimo, Masafumi Yashima, Tatsuki Okamoto (Tohoku University, Japan)

D4 [219] Surface Potential Measurement of Stress Grading System of High Voltage Rotating Machine Coils

Using Pockels Field Sensor

Dai Onishi[1], Akiko Kumada[1], Kunihiko Hidaka[1], Takahiro Umemoto[2], Yasutomo Otake[2], Takao Tsurimoto[2] ([1] The University of Tokyo, Japan, [2] Mitsubishi Electric Corporation, Japan)

D5 [077] On-line Non Intrusive PDs' Measurements on Aeronautical Systems

Cédric Abadie[1, 2], Thibaut Billard[1], Sorin Dinculescu[2], Thierry Lebey[2] ([1] IRT Saint-Exupéry, France, [2] LAPLACE, Université de Toulouse, CNRS, INPT, UPS, France)

15:20 – 17:25 ***Session E: Degradation #1 (Oral Room #1, 9th floor)***

Chair: Suwarno (Inst. Teknologi Bandung), Co-chair: M. Onoda (Univ. Hyogo)

E1 (SI) [181] PPLP and Kraft Paper Under High Voltage in Liquid Nitrogen

Stéphane Holé[1], Christian-Éric Bruzek[2], Nicolas Lallouet[3] ([1] LPEM/UPMC, Sorbonne Universités/ESPCI-Paris, PSL Research University/CNRS, France, [2] Nexans France, France, [3] Nexans France, France)

E2 [204] Insulation Characteristics of Dry-cured and Extruded Three-layer (E-E Type) 6.6 kV Removed XLPE Cables with Additional Accelerated Water-tree Degradation

Takashi Kurihara[1], Tomoyuki Sato[2], Kenji Homma[2] ([1] Central Research Institute of Electric Power Industry, Japan, [2] Tohoku Electric Power Co., Inc., Japan)

E3 [332] Partial Discharges Behavior under Different Rectified Waveforms

Antonino Imburgia[1], Pietro Romano[1], Fabio Viola[1], Naohiro Hozumi[2], Shosuke Morita[2] ([1] University of Palermo, Italy, [2] Toyohashi University of Technology, Japan)

E4 [154] Stress Effects on the Electrical Degradation of Additive Manufactured Materials

Ryota Kitani, Shinya Iwata (Osaka Research Institute of Industrial Science and Technology, Japan)

E5 [294] Assessment of the High Field Behaviour of Polyimide Films: Experimental Methods and Impact of Electrode Material

F. Carrasco[1], A. Velazquez-Salazar[1], L. Berquez[1], S. Diaham[1], V. Griseri[1], T. Lebey[1], M.L. Locatelli[1], D. Marty-Dessus[1], H. Muto[2], K. Tajiri[2], T. Tsurimoto[2], G. Teyssedre[1] ([1] LAPLACE, Université de Toulouse, CNRS, INPT, UPS, France, [2] Mitsubishi Electric Corporation, Japan)

E6 [210] A Simulation on Space Charge Distribution Caused by Nonlinear Conductivity in HVDC Cable Insulation

Yunlong Sun, Zhonghua Li, Changyou Suo, Wenmin Guo, Huan Zheng (Harbin University of Science and Technology, China)

15:20 - 17:35 ***Session F: Nanocomposite #1 (Oral Room #2, 4th floor)***

Chair: M. Frechette (Hydro-Québec's Res. Inst.), Co-chair: M. Unge (ABB Corp. Research)

F1 (SI) [073] A Quantum Dot Model for Nanoparticles Dispersed in Polymers: How does it work?

Toshikatsu Tanaka (Waseda University, Japan)

F2 (SI) [345] Fabrication and Characterization of LDPE Si/SiO_2 Core/shell Nanocomposites

Behzad Ghafarizadeh[1], Michel Fréchette[2], Eric David[1] ([1] École de technologie supérieure,

Canada, [2] Hydro-Québec's Research Institute, Canada)

F3 [147] The Effect of Frequency on the Dielectric Strength of Epoxy Resin and Epoxy Resin Based Nanocomposites

Huifei Jin[1], Ioannis-Alexandros Tsekmes[2], Jiayang Wu[1], Armando Rodrigo Mor[1], Johan Smit[1] ([1] Delft University of Technology, the Netherlands, [2] Prysmian Netherlands B.V, the Netherlands)

F4 (SI) [599] Nano/Micro – Composite Particles. Preparation Process and Applications

Hiroyuki Muto (Toyohashi University of Technology, Japan)

F5 [255] Evaluation of Coefficient of Thermal Expansion and Relative Permittivity of TiO_2/SiO_2 Epoxy Composite

Hiroya Ozaki[1], Muneaki Kurimoto[1], Toru Sawada[1], Toshihisa Funabashi[1], Takeyoshi Kato[1], Yasuo Suzuoki[2] ([1] Nagoya University, Japan, [2] Aichi Institute of Technology, Japan)

F6 [112] Dielectric Properties of Graphene-filled Epoxy Nanocomposite with Enhanced Thermal Conductivity

He Li[1], Huidong Tian[1], Mengchu Cai[2], Ao Gong[1], Ziyu Zhou[1], Chuang Wang[1, 3], Zongren Peng[1] ([1] Xi'an Jiaotong University, China, [2] Xi'an Jiaotong Unviersity, China, [3] Xi'an University of Technology, China)

Wed. Sept. 13th

Invited Lecture (Oral Room #1, 9th floor)

9:00 - 10:20 ***Symposium Plenary Lecture*** ***Chair: Y. Sekiguchi (Sumitomo Electric Industries, Ltd.)***

Z2 [222] Reliability of Low Voltage Inverter-fed Motors. What Have We Learned, Perspectives, Open Points

Andrea Cavallini (University of Bologna, Italy)

10:40 – 12:10 ***Special Session SP1: Partial Discharge (Oral Room #1, 9th floor)***

Chair: R. Sarathi (Indian Inst. Tech. Madras)

SPD1(SI) [341] The Role of IEC 60034-27-5 for IEC 60034-18-41. Offline PD Test Methods with Repetitive Impulse Voltage

Ken Kimura (Nara National Institute of Technology, Japan)

SPD2 [401] Recent Progress in Round-Robin Test of Repetitive Partial Discharge Inception Voltage Measurements on Complete Winding of 4 kW Random-Wound Motor

Yusuke Kikuchi[1], Takahiro Ishida[2], Takahisa Ueno[3], Seiji Kanazawa[4], Masayuki Nagao[5], Masayuki Hikita[6], Yoshinobu Murakami[5], Masayoshi Nagata[1] ([1] Univ. of Hyogo, Japan, [2] Shizuoka Institute of Sci. and Tech., Japan, [3] Oita National College of Tech., Japan, [4] Oita Univ., Japan, [5] Toyohashi Univ. of Tech., Japan, [6] Kyushu Institute of Tech., Japan)

SPD3 [236] Partial Discharge Inception Voltage under Positive Surge Voltage Application Influenced by Surface Charge on Polyimide Film

Tomohiro Kawashima, Hideyuki Takahagi, Ryoto Kubota, Yoshinobu Murakami, Naohiro Hozumi, Masayuki Nagao (Toyohashi University of Technology, Japan)

SPD4(SI) [288b] Partial Discharge and Aging Phenomena in Insulation Systems of Rotating Machines Fed by Power Electronics

Gian Carlo Montanari, Paolo Seri, Fabrizio Negri (University of Bologna, Italy)

10:40 - 12:05 ***Session G: Space Charge #1 (Oral Room #2, 4th floor)***

Chair: K. Wu (Xi'an Jiaotong Univ.)

G1 [282] Temperature Profile Estimation for High Spatial Resolution Space Charge Measurement with Thermal Pulse Methods

Céline Corbrion[1], Stéphane Holé[1], Petru Notingher[2], Serge Agnel[2], Laurent Berquez[3], Didier Marty-Dessus[3] ([1] LPEM / UPMC, Sorbonne Universités / ESPCI-Paris, PSL Research University / CNRS, France, [2] IES / Université Montpellier 2 / CNRS, France, [3] LAPLACE / Université Paul Sabatier / CNRS, France)

G2 [281] Space Charge Analysis and Trap Evaluation in Silicone Rubber by Density Functional Study

Weiwang Wang[1, 2], Yasuhiro Tanaka[2], Tatsuo Takada[2], Shengtao Li[1] ([1] Xi'an Jiaotong University, China, [2] Tokyo City University, Japan)

G3 (SI) [115] Space Charge Measurement of Cross-linked Polyethylene at Low Temperatures

Yalin Wang[1], Jiandong Wu[1], Weikang Li[2], Yi Yin[1] ([1] Shanghai Jiao Tong University, China, [2] Global Energy Interconnection Research Institute, China)

G4 [215] Influence of Mechanical Pressure on Space Charge Penetration Behavior in Low-density Polyethylene (LDPE) Sheet

A. I. Mohamed[1], M. M. Saari[1], R. Ozaki[2], K. Kadowaki[2] ([1] Universitii Malaysia Pahang, Malaysia, [2] Ehime University, Japan)

12:00 - 13:30 ***Lunch Break***

13:30 - 17:00 ***MVP and Poster Session #1 (Poster Room, 3rd floor)***

MVP Group 1A ***Coordinator: H. Misaka (Central Res. Inst. Electr. Power Industry)***

V1-01 [123] Sterilization of *Escherichia coli* in Milk by High Electric Field Pulse

Motoki Yamada, Yuichi Murakami, Yuji Muramoto (Meijo University, Japan)

V1-02 [169] Loss of Sciophilous Character of Crop Seeds Subjected to Barrier Discharge Produced by Repetitive Polarity-reversed Voltage Pulses

Akihiro Nakata, Ryotaro Ozaki, Kazunori Kadowaki (Ehime University, Japan)

V1-03 [232] Sterilization of *Escherichia coli* by Marx Circuit with Switches Using Bipolar Junction Transistors

Takunao Sato, Yuichi Murakami, Yuji Muramoto (Meijo University, Japan)

V1-04 [128] Performance Comparisons between a Single-Channel Feedforward ANC System and a Single-Channel Feedback ANC System in a Noisy-Environment Classroom

Chadaporn Sookpuwong, Chow Chompoo-Inwai (King Mongkut's Institute of Technology

Ladkrabang, Thailand)

V1-05 [076] Trap and Carrier Transport of Pristine and Aged Silicone Rubber by Surface Potential Measurements

Wenbin Kang[1], Chenyu Yan[2], Shijun Li[2], Yin Huang[2], Daomin Min[2], Shengtao Li[2] ([1] China Electric Power Research Insutitute, China, [2] Xi'an Jiaotong University, China)

V1-06 [094] Effect of Water on AC Breakdown Properties of Vegetable-Oil-Based Insulating Fluid Mixed with Mineral Oil

Yushi Hiramatsu, Kosuke Kamidani, Yuji Muramoto (Meijo University, Japan)

V1-07 [097] Effect of ZnO Nanoparticles on the Surface Potential Decay of Epoxy Nanocomposites

Yongsen Han[1, 2], Shengtao Li[1], Yongjie Nie[1], Daomin Min[1] ([1] Xi'an Jiaotong University, China, [2] Harbin University of Science and Technology, China)

MVP Group 1B Coordinator: N. Hozumi (Toyohashi Univ. Tech.)

V1-08 [104] Electro-Acoustic Reflectometry: Reaching High Spatial Resolution and High Sensitivity for Space Charge Measurements

Louiza Hamidouche, Emmanuel Géron, Stéphane Holé (CNRS, PSL Research University, ESPCI-Paris, Sorbonne Universités, UPMC, France)

V1-09 [113] Enhanced Breakdown Field of $x SrCu_3Ti_4O_{12}/(1-x)CaCu_3Ti_4O_{12}$ Composite Ceramics

Zhuang Tang, Yuwei Huang, Kangning Wu, Jianying Li (Xi'an Jiaotong University, China)

V1-10 [130b] Fire Safety and Electrical Properties of Mineral Oil/Synthetic Ester Mixtures

Grzegorz Dombek, Jaroslaw Gielniak, Robert Wroblewski (Poznan University of Technology, Poland)

V1-11 [131] Influence of Poling Temperature on Depolarization Current Properties of Ice Electret

Yudai Tsuchiya, Yoshiko Oshika, Yuji Muramoto (Meijo University, Japan)

V1-12 [146] Surface Flashover Performance of Epoxy Resin Microcomposites Influenced by Ozone Treatment

Yin Huang[1], Daomin Min[1], Dongri Xie[1], Shengtao Li[1], Xuan Wang[2], Shengjun Lin[3] ([1] Xi'an Jiaotong University, China, [2] Harbin University of Science and Technology, China, [3] Pinggao Group Co., Ltd., China)

V1-13 [160] Solid State Tesla Transformer for Flashover Test on Suspension Insulators

Watchara Pongsathit, Peerawut Yutthagowith, Worrakan Limcharoen (King Mongkut's Institute of Technology Ladkrabang, Thailand)

V1-14 [164] Investigation of Partial Discharge Life Characteristics of Twisted Pair of Enamelled Wires

Kei Ooi, Masafumi Yashima, Tatsuki Okamoto (Tohoku University, Japan)

MVP Group 1C Coordinator: M. Kurimoto (Nagoya Univ.)

V1-15 [165] Effect of Accelerated Aging on the Electrical Performance of Epoxy Resin Nanocomposite Filled with SiO_2 Nano Particles

Mu Liang, K. L. Wong, Ammar Al-gheilani (RMIT University, Australia)

V1-16 [168] The Effect of Frequency on the Dielectric Breakdown of Insulation Materials in HV Cable

Systems

Jiayang Wu, Huifei Jin, Armando Rodrigo Mor, Johan Smit (Delft University of Technology, the Netherlands)

V1-17 [171] Measurement of AC Electric Field in Transformer Oil Using Kerr Effect

Ryosuke Kondo[1], Keisuke Yoshimura[1], Yusuke Hachisu[1], Jeon Hyeon-Gu[1], Masaharu Fujii[1], Haruo Ihori[1], Yasutomo Otake[2], Takahiro Umemoto[2], Takao Tsurimoto[2] ([1] Ehime University, Japan, [2] Mitsubishi Electric Corporation, Japan)

V1-18 [176] Examining Faulty Transformer Tap Changer Using Frequency Response Analysis

S. Al-Ameri[1], M. F. M. Yousof[1], H. Ahmad[1], M. Alsubari[1], M. A. Talib[2] ([1] University Tun Hussein Onn Malaysia, Malaysia, [2] Tenaga Nasional Berhad Research, Malaysia)

V1-19 [063b] Mutual Coupling between Driven Rods in Grounding System of Transmission Lines

Phuc X. Nguyen[1], Thinh Pham[2], Top V. Tran[1] ([1] Hanoi University of Science and Technology Hanoi, Vietnam, [2] Underground Systems, Inc., USA)

V1-20 [080] Numerical Calculation of the Influence of the Inner Corona Protection Layer Properties on the Performance of the Turbine Generator Stator Coil

Yizhong Zhang, Lijun Wang, Gang Zheng (Shanghai Electric Power Generation Equipment Co., Ltd., China)

V1-21 [105] Image Analysis of Dynamic Drop Test to Measure the Retention of Hydrophobicity of Polymeric Insulating Materials

Masanori Miwa, Tetsuro Tokoro (Gifu National College of Technology, Japan)

MVP Group 1D Coordinator: Y. Muramoto (Meijo Univ.)

V1-22 [126] Influence of Key Structure Parameters on Electrical Field Distribution of Tri-post Insulator Used in UHV

Huidong Tian, Haoran Wang, Zihao Guo, Peng Liu, Zongren Peng (State Key Laboratory of Electrical Insulation and Power Equipment, China)

V1-23 [137] Characteristic Change of Sealing Rubber due to Usage Time

Takuya Takeda[1], Takahiro Akutagawa[1], Masafumi Yashima[1], Yuji Yaegashi[2], Tatsuki Okamoto[1] ([1] Tohoku University, Japan, [2] Tohoku Electric Power Co., Inc., Japan)

V1-24 [143] Aging Characteristics of Epoxy Resin in Hygrothermal Environment

Yu Liu[1], Youyuan Wang[1], Jun Liu[2], Shiyou Wang[3], Zhengyong Huang[1] ([1] Chongqing University, China, [2] State Grid Chongqing Electric Power Company, China, [3] ABB Company, China)

V1-25 [144] Breakdown Characteristics of Printed Circuit Boards under Pulsed Square Wave

Taotao Xiong[1], Quan Zhou[1], Tianyan Jiang[2], Xuefeng Li[1], Tianhe Yang[1] ([1] Chongqing University, China, [2] Chongqing University of Technology, China)

V1-26 [177b] Failure Prediction System of Water Treeing Using 3D VLF Tandelta of MV Cable

S.W. Lee, J.H. Heo, H.G. Park, E.C. Lee, C.S. Oh, S.W. Kim, J.S. Lim (Mok-Po National Maritime University, Korea)

V1-27 [184] Temperature Field Distribution of Optical Fiber Composite Low-Voltage Cable

Muhammad Aqib Shah[1], Yu Chen[1], Ahsan Ashfaq[1], Guanshu Sun[1], Yao Kai[1], Lina Fu[2], Jing Yu[2] ([1] Xi'an Jiaotong University, China, [2] Shanghai Electric Cable Research Institute, China)

V1-28 [216] Measurement of Space Charge Accumulated in Multi-Layered Samples Composed of Different Insulators Used in the Joints of DC Transmission Cables

Tsuyoshi Tohmine[1], Toshiyuki Fujitomi[1], Hiroaki Miyake[1], Yasuhiro Tanaka[1], Yukito Ida[2], Yoshiyuki Inoue[2] ([1] Tokyo City University, Japan, [2] Sumitomo Electric Industries, Ltd., Japan)

Poster Presentations

P1-01 [295b] PD Monitoring of Power Transformers by UHF Sensors

S. Tenbohlen[1], M. Beltle[1], Martin Siegel[2] ([1] University of Stuttgart, Germany, [2] BSS Hochspannungstechnik GmbH, Germany)

P1-02 [071] Space Charge Characteristics of Multiple Reigniting Secondary Arc in Atmospheric Air

Runchang Li[1], Hongshun Liu[1], Jie Lou[1], Yuantao Zhang[1], Qiuqin Sun[2], Qingquan Li[1], Yanjie Zhang[3], Jinxing Huang[3] ([1] Shandong University, China, [2] Hunan University, China, [3] State Grid of China Technology College, China)

P1-03 [079] An Experimental Study on the Interface Polarization of Double-Layered Composite Structure Containing Nonlinear Dielectrics

Changyou Suo, Zhonghua Li, Yunlong Sun, Tingting Wang, Huan Zheng, Wenmin Guo (Harbin University of Science and Technology, China)

P1-04 [107] Space Charge and DC Breakdown Behavior of Natural Ester Impregnated Insulation Paper with Different Ageing Conditon

Runhao Zou[1], Jian Hao[1], Ruijin Liao[1], Lijun Yang[1], Qian Wang[2] ([1] Chongqing University, China, [2] State Grid Chongqing Electric Power Co. Chongqing Electric Power Research Institute, China)

P1-05 [109] Deterioration Diagnosis of Epoxy Resin Evaluated by Current Integration Meter

Masayuki Fujii[1], Masumi Fukuma[2], Shin'ichi Mitsumoto[3], Yoitsu Sekiguchi[4] ([1] National Institute of Technology, Oshima College, Japan, [2] National Institute of Technology, Matsue College, Japan, [3] National Institute of Technology, Toyota College, Japan, [4] Sumitomo Electric Industries, Ltd., Japan)

P1-06 [119] Periodic Grounded DC Tree in XLPE under Different DC Prestressing Times

Yani Wang, Feng Guo, Jiandong Wu, Yi Yin (Shanghai Jiao Tong University, China)

P1-07 [122] Research on the Polarization Relaxation Current and Equivalent Circuit of Double-layered XLPE/EPDM

Shuhui Yi[1], Yalin Wang[1], Weikang Li[2], Jiandong Wu[1], Yi Yin[1] ([1] Shanghai Jiao Tong University, China, [2] Global Energy Interconnection Research Institute, China)

P1-08 [175] The Influence of Thermally Aged Surface of Polyethylene Blend Films on Space Charge and Charge Transport Dynamics

Somyot Tantipattarakul, Alun Vaughan, Thomas Andritsch (University of Southampton, UK)

P1-09 [191a] Influence of Corona Discharge Intensity on Space Charge Measurement under Negative DC Corona in Air

Hongbo Liu[1], Ruijin Liao[1], Guodong Xu[2], Kanglin Liu[1], Xuetong Zhao[1] ([1] Chongqing University, China, [2] The Army Aviation Representative Bureau, China)

P1-10 [191b] Effects of Nano-Al_2O_3 on Space Charge Behavior and Trapping Characteristics of Cellulose Insulation Paper

Min Xiang[1], Ruijin Liao[1], Yuan Yuan[1], Fei Gao[2], Jian Hao[1] ([1] Chongqing University, China, [2] China Electric Power Research Institute, China)

P1-11 [196] Study on Charge Dynamics in Water-Tree XLPE Insulation for Deterioration Diagnosis

Nhet Ra[1], Hiroyuki Futami[1], Tomohiro Kawashima[1], Yoshinobu Murakami[1], Naohiro Hozumi[1], Takashi Kurihara[2], Tatsuki Okamoto[2] ([1] Toyohashi University of Technology, Japan, [2] Central Research Institute of Electric Power Industry, Japan)

P1-12 [197] Development of the New Partial discharge Measuring Method and Device for Long Power Cable Using Foil Electrode

Nhet Ra[1], Nur Sabihah Binti Mustafa[1], Hiroyuki Futami[1], Tomohiro Kawashima[1], Yoshinobu Murakami[1], Naohiro Hozumi[1], and Toshihiro Takahashi[2] ([1] Toyohashi University of Technology, Japan, [2] Central Research Institute of Electric Power Industry, Japan)

P1-13 [212a] Measurement and Analysis of Surface Potential Decay of Polyimide Films under High Temperature

Jia-wei Zhang[1, 2], Wei Zhang[1], Yan-cheng Cui[1], Guo-an Xue[1], Rui-tong Liu[3] ([1] Northeast Electric Power University, China, [2] Chinese Academy of Sciences, China, [3] State Grid Liaoning Province Power Company Limited Power Research Institute, China)

P1-14 [072] Study on DC Breakdown Strength and Morphology in XLPE/$Al(OH)_3$ Nanocomposites

Shihang Wang, Peixing Chen, Jiao Xiang, Jianying Li (State Key Laboratory of Electrical Insulation and Power Equipment, China)

P1-15 [101] Nano-scale Evaluation of Electrical Tree Initiation in Silica/Epoxy Nano-composite Thin Film

Takuya Onishi[1], Shuichiro Hashimoto[1], Motohiro Tomita[1], Takanobu Watanabe[1], Kotaro Mura[2], Toshihiro Tsuda[2], Tetsuo Yoshimitsu[2] ([1] Waseda University, Japan, [2] Toshiba Mitsubishi-Electric Industrial Systems Corporation, Japan)

P1-16 [135] ZnO-Polyethylene Interface: Band Alignment

Elena Kubyshkina[1], B.L.G. Jonsson[1], Mikael Unge[2, 3] ([1] KTH Royal Institute of Technology, Sweden, [2] ABB Corporate Research, Sweden, [3] KTH Royal Institute of Technology, Sweden)

P1-17 [151] Modification of Resin/Hardener Stoichiometry Using POSS and its Effect on the Dielectric Properties of Epoxy Resin Systems

Istebreq A. Saeedi, Thomas Andritsch, Alun S. Vaughan (University of Southampton, UK)

P1-18 [152] Erosion Resistance of Micro-AlN and Nano-SiO_2 Hybrid Filled Silicone Rubber Composites

M. Tariq Nazir[1], B.T. Phung[1], Shengtao Li[2] ([1] University of New South Wales Sydney, Australia, [2] Xi'an Jiaotong University, China)

P1-19 [136] Characterization of Partial Discharges in Solid Insulators under DC Voltage Using Physical Cavity

Properties

Nathalie Morette, Hela Daassi-Gnaba, Thierry Ditchi, Yacine Oussar (PSL Research University, ESPCI-Paris, Sorbonne Universités, UPMC, Univ Paris 06, CNRS, France)

P1-20 [156] Analyses of Rogowski Coils for Partial Discharge Measurement

W. Chonpathomphikunloed, B. Paophan, A. Kunakorn, P. Yutthagowith, M. Leelachindakrairerk (King Mongkut Institute of Technology Ladkrabang, Thailand)

P1-21 [157] Analysis of Frequency Converters for PD Test

Phattarin Kitcharoen, Anantawat Kunakorn, Peerawut Yutthagowith, Siriwat Potivejkul (King Mongkut's Institute of Technology Ladkrabang, Thailand)

P1-22 [158] Design and Analysis of Coupling Device in Partial Discharge Detection

Nattapon Marukatat, Anantawat Kunakorn, Peerawut Yutthagowith, Suparat Pumyoy (King Mongkut's Institute of Technology Ladkrabang, Thailand)

P1-23 [167] Effect of Superposed Repetitive Pulses onto DC Voltage on Discharge Extension into Fog Water Produced by Electrospray

Takahiro Kondo, Ryotaro Ozaki, Kazunori Kadowaki (Ehime University, Japan)

P1-24 [174] Partial Discharge Deterioration and Through-hole Formation in Polypropylene for Power Capacitors. Effects of PD Magnitude and Accumulated PD Charge

Ryouhei Yano[1], Yasuo Suzuoki[1], Muneaki Kurimoto[2], Takeyoshi Kato[2], Toshihisa Funabashi[2], Fumitaka Komori[3], Yukio Sasatani[4], Tomohiro Kawai[4], Shinkichi Hamada[4], Shintarou Ogura[4], Yuuya Sano[4] ([1] Aichi Institute of Technology, Japan, [2] Nagoya University, Japan, [3] NIT Toba College, Japan, [4] Nissin Electric Co., Ltd., Japan)¥

13:30 – 15:10 ***Session H: Partial Discharge #2 (Oral Room #1, 9th floor)***

Chair: G. C. Montanari (Univ. Bologna), Co-chair: K. Kimura (Nat. Inst. Tech. Nara College)

H1 [673] The Influence of Switching Impulse Voltage Superimposition on Partial Discharge Characteristics of Oil Impregnated Paper Insulation System and Conditions inside its Oil Gap Defect

Yu Iwashita[1, 3] Atsuhito Tokudome[1], Norio Yamaguchi[1], Yuta Makino[2], Takashi Kurihara[2], Toshihiro Takahashi[2], Masahiro Kozako[3], and Masayuki Hikita[3] ([1] Kyushu Electric Power Co. Inc., Japan, [2] CRIEPI, Japan, [3] Kyushu Institute of Technology, Japan)

H2 [275] Voltage and Current-Harmonics Induced Ageing in Electrical Insulation

Aravinth Subramaniam, Animesh Sahoo, Sai Srinivas Manohar, Sanjib Kumar Panda (National University of Singapore, Singapore)

H3 [066] Partial Discharge Characteristics of Electrical Treeing in XLPE Insulation Exposed to Voltages of Different Rise Times

T. J. Å. Hammarström[1], T. Bengtsson[1, 2], S. M. Gubanski[1] ([1] Chalmers University of Technology, Sweden, [2] ABB Corporate Research, Sweden)

H4 [148] A High Voltage Repetitive Square Wave Voltage Generator Used for Endurance Evaluation of Inverter-fed Motors

Peng Wang[1], Jinquan Li[1], Jian Wang[1], Andrea Cavallini[2], Jiawei Zhang[3] ([1] Sichuan University,

China, [2] University of Bologna, Italy, [3] Sichuan University, Sichuan, China, [3]Northeast Electric Power University, China)

H5 [311] Effects of Insulation and Oil Gap Thickness on Partial Discharge Characteristics of Oil-Impregnated Paper Insulation System for Oil-filled Cable

Yuta Makino[1], Takashi Kurihara[1], Toshihiro Takahashi[1], Yu Iwashita[2, 3], Norio Yamaguchi[2], Atsuhito Tokudome[2], Tatsuki Okamoto[1, 4] ([1] CRIEPI, Japan, [2] Kyushu Electric Power Co. Inc, Japan, [3] Kyushu Institute of Technology, Japan, [4] Tohoku University, Japan)

15:20 - 17:25 ***Session I: Nanocomposite #2 (Oral Room #2, 4th floor)***

Chair: C. C. Reddy (Indian Inst. Tech. Ropas), Co-chair: Shengtao Li (Xi'an Jiaotong Univ.)

I1 (SI) [269] Investigation on Nanocomposite Materials for Power Cable Insulation

C Iyyappan, D satyamoorthy, Priyesh Pandey, C C Reddy (IIT Ropar, India)

I2 [308] DC Breakdown Voltage Tests may not be a Good Indicator of Long-Term Ageing Behaviour. A Study of Silica – XLPE Nanocomposites

Weiqun Lei[1, 2], L. A. Dissado[2], S.J. Dodd[2], N.M. Chalashkanov[2], J.C. Fothergill[2], Yonghong Cheng[1], Xiaoquan Zheng[1] ([1] Xi'an Jiaotong University, China, [2] University of Leicester, UK)

I3 [350] Electrical and Mechanical Properties of Ethylene Ethylacrylate-Carbon Nanotube (EEA-CNT) Composites

Gyujin Jung[1], Changgeon Lee[1], Yeji Park[1], JongEun Kim[1], Ho-Gyu Yoon[1], Kwang S. Suh[1], June-Ho Lee[2], TaeYoung Kim[3] ([1] Korea University, Korea, [2] Hoseo University, Korea, [3] Gachon University, Korea)

I4 [288a] Nanocomposite Polypropylene for DC Cables and Capacitors: A New European Project

Gian Carlo Montanari[1], Paolo Seri[1], Mikko Karttunen[2], Mika Paajanen[2], Kari Lahti[3], Ilkka Rytöluoto[3] ([1] University of Bologna, Italy, [2] VTT Technical Research Centre of Finland Ltd., Finland, [3] Tampere University of Technology, Finland)

I5 (SI) [309] Study on Short-term DC Breakdown and Corona-resistance Mechanism of Polyimide

Dongri Xie, Chenyu Yan, Yin Huang, Daomin Min, Shengtao Li (Xi'an Jiaotong University, China)

I6 [130a] Cooling Properties of Natural Ester Modified by Nanopowders Fullerene C_{60} and TiO_2 for High Voltage Insulation Applications

Grzegorz Dombek, Zbigniew Nadolny, Piotr Przybylek (Poznan University of Technology)

Thr. Sept. 14th

9:00 – 10:25 ***Session J: Functional Materials (Oral Room #1, 9th floor)***

Chair: S. Kornhuber (Univ. Appl. Sci. Zittau/Görlitz)

J1 (SI) [145] Detection of Environmental Pollutants with Oxidoreductases

Mitsuyoshi Onoda[1], Daluwathu M. G. Preethichandra[2] ([1] University of Hyogo, Japan, [2] Central Queensland University, Australia)

J2 [247] Thermally-Manageable Superhydrophobic Soot/Fluorocarbon Hybrid Thin Films

Qi Zhao, Feipeng Wang, Gang Wen, Zhengyong Huang, Jian Li (Chongqing University, China)

J3 [223] Enhancement of Electron Injection Accompanied with the Increase in Hole Injection for Organic Light-Emitting Diodes

Tatsuo Mori, Yuma Ishibashi, Sunao Kimura (Aichi Institute of Technology, Japan)

J4 [253] Transmission Surface Plasmon Resonance Imaging based on Gold Grating/Silver Nanoparticles for Detection of Creatinine

Chammari Pothipor, Chutiparn Lertvachirapaiboon, Kazunari Shinbo, Keizo Kato, Futao Kaneko, Kontad Ounnunkad, Akira Baba (Niigata University, Japan)

9:00 – 10:25 ***Special Session SP2: APIANS - Analysis for Polymeric Insulating Materials Using Advanced Numerical Simulation (Oral Room #2, 4th floor)***

Chair: T. Tanaka (Waseda Univ.)

SAP1(SI) [334] High Field Ion Mobility in Dielectric Polymers. A Molecular Dynamics Study of Water in Poly(dimethylsiloxane)

Mikael Unge[1, 2], Joakim Jämbeck[1] ([1] ABB Corporate Research, Sweden, [2] KTH Royal Institute of Technology, Sweden)

SAP2 [256] Quantum Chemical Calculations of Surfactant Having Suppression Effect on Water Trees

Hiroaki Uehara[1], Shinya Iwata[2], Yasuo Sekii[3], Tatsuo Takada[4], Yang Cao[5] ([1] Kanto Gakuin University, Japan, [2] Osaka Research Institute of Industrial Science and Technology, Japan, [3] Sekii PE Laboratory, Japan, [4] Tokyo City University, Japan, [5] University of Connecticut, USA)

SAP3 [363] Atomistic Modeling of Charge Transport in Polyethylene

Masahiro Sato, Akiko Kumada, Kunihiko Hidaka (The University of Tokyo, Japan)

SAP4 [303] A Variance Decomposition Method for Efficient Charge Transport Model Calibration

F. Baudoin[1], I. Alhossen[2], F. Bugarin[2], S. Segonds[2], G. Teyssedre[1], C. Laurent[1] ([1] LAPLACE, Université de Toulouse, CNRS, INPT, UPS, France, [2] University of Toulouse, UPS, INSA, ISAE, ICA)

10:40 - 15:00 ***MVP and Poster Session #2 (Poster Room, 3rd floor)***

MVP Group 2A ***Coordinator: M. Fukuma (Nat. Inst. Tech. Matsue College)***

V2-01 [237] Influence of Filler Orientation and Molding Temperature on Electrical and Thermal Properties of PMMA/h-BN Composite Material Produced by Electrostatic Adsorption Method

Norikazu Hamasaki, Shuhei Yamaguchi, Shohei Use, Tomohiro Kawashima, Hiroyuki Muto, Masayuki Nagao, Naohiro Hozumi, Yoshinobu Murakami (Toyohashi University of Technology, Japan)

V2-02 [242] Reduction Effect of Cross-linking By-products on Dielectric Strength in Polyethylene under DC Stress

Takehiro Kanai, Toshiyuki Fujitomi, Hiroaki Miyake, Yasuhiro Tanaka (Tokyo City University, Japan)

V2-03 [249] Dissolved Gas Analysis (DGA) of Natural Ester Oils under Arcing Faults

M.H.A Hamid[1], M.M Arifin[1], N.I.A Katim[1], N.A.M Amin[1], M.T Ishak[1], N. Azis[2] ([1] Universiti Pertahanan Nasional Malaysia, Malaysia, [2] Universiti Putra Malaysia, Malaysia)

V2-04 [251] Ageing Effect of Vegetable Oils Impregnated Paper in Transformer Application

M. M. Ariffin, M. T. Ishak, M. H. A. Hamid, N. I. A. Katim, A. S. A. Hasim (National Defence University of Malaysia, Malaysia)

V2-05 [252] Influence of Decrease in Thickness on Permittivity of Stretched Acrylic Elastomer

Kento Naya[1], Muneaki Kurimoto[1], Toshihisa Funabashi[1], Takeyoshi Kato[1], Yasuo Suzuoki[2] ([1] Nagoya University, Japan, [2] Aichi Institute of Technology, Japan)

V2-06 [257] Investigation on AC Breakdown of Vegetable Oils with Insulated Electrodes

N. I. A. Katim[1], M. T. Ishak[1], S. Razali[1], M. H. A. Hamid[1], M. M. Ariffin[1], N. Azis[2] ([1] National Defence University of Malaysia, Malaysia, [2] University Putra Malaysia, Malaysia)

V2-07 [227] Charge Accumulation Characteristics of Fluorine Insulating Materials under Electron Beam Irradiation

Masahito Miyoshi, Kimio Hijikata, Hiroaki Miyake, Yasuhiro Tanaka (Tokyo City University, Japan)

MVP Group 2B Coordinator: H. Uehara (Kanto Gakuin Univ.)

V2-08 [261] Three-dimensional Vibration Analysis of Single-phase Transformer Winding under Inter-disc Fault

Svyatoslav Nezhivenko[1], Mehdi Bagheri[1], Toan Phung[2] ([1] Nazarbayev University, Kazakhstan, [2] University of New South Wales, Australia)

V2-09 [262] Lightning Impulse Investigation on Vegetable Oils and Simulation of Electric Field Distribution

N.A.M Amin[1], N.I.A Katim[1], M.T Ishak[1], M.H.A Hamid[1], M.M Ariffin[1], M.S. Abd Rahman[2], N. Azis[2] ([1] National Defence University of Malaysia, Malaysia, [2] University Putra Malaysia, Malaysia)

V2-10 [264] High Voltage Insulator Surface Evaluation Using Image Processing

Damira Pernebayeva, Mehdi Bagheri, Alex James (Nazarbayev University, Kazakhstan)

V2-11 [265] Permittivity Estimation of Hydrocarbon-based Thermosetting Resin Using Quantum Chemical Calculation

Yuki Fuchi[1], Ryota Nakasako[1], Yusuke Okubo[1], Masahiro Kozako[1], Masayuki Hikita[1], Nobuhito Kamei[2] ([1] Kyushu Institute of Technology, Japan, [2] RIMTEC Corporation, Japan)

V2-12 [266] Influence of Electrode Interface on Insulation Property of Hydrocarbon-based Thermosetting Composite with Silica Filler

Ryota Nakasako[1], Yuki Fuchi[1], Yusuke Okubo[1], Masahiro Kozako[1], Masayuki Hikita[1], Nobuhito Kamei[2] ([1] Kyushu Institute of Technology, Japan, [2] RIMTEC Corporation, Japan)

V2-13 [273] Comparison of Insulation Characteristics in Electrode System with Silica Filled

Hydrocarbon-based Thermosetting Resin

Yusuke Okubo[1], Yuki Fuchi[1], Ryota Nakasako[1], Masahiro Kozako[1], Masayuki Hikita[1], Nobuhito Kamei[2] ([1] Kyushu Institute of Technology, Japan, [2] RIMTEC Corporation, Japan)

V2-14 [250] Space Charge Formation in XLPE at Polarity Reversal under High Temperature

Hiroki Kasuga, Hiroaki Miyake, Yasuhiro Tanaka (Tokyo City University, Japan)

MVP Group 2C Coordinator: M. Sato (Univ. Tokyo)

V2-15 [189] Terahertz Absorption Spectroscopy of Poly(ether ether ketone)

Takuya Kaneko[1], Naoshi Hirai[2], Yoshimichi Ohki[1, 2] ([1] Department of Electrical Engineering and Bioscience, Waseda University, Japan, [2] Research Institute for Materials Science and Technology, Waseda University, Japan)

V2-16 [203] A Review on Condition Monitoring of GIS

Animesh Sahoo, Aravinth Subramaniam, Saurabh Bhandari, Sanjib Kumar Panda (National University of Singapore, Singapore)

V2-17 [221] Basic Study on Measurement of Electromagnetic Waves Emitted by Partial Discharge in Cable Joint for High Voltage Overhead Transmission

Seiya Masuda[1], Takaaki Koga[1], Masahiro Kozako[1], Masayuki Hikita[1], Hiroshi Haruyama[2], Isamu Kato[2], Hideaki Sato[2], Fumiyasu Aono[2] ([1] Kyushu Institute of Technology, Japan, [2] TEPCO Power Grid, Inc., Japan)

V2-18 [240] Real-time Dry-type Transformer Aging Evaluation

Ilyas Soltanbayev, Mehdi Bagheri, Toan Phung (Nazarbayev University, Kazakhstan)

V2-19 [259] Grounding Effect on Transient Earth Voltage Signal Induced by Partial Discharge in Metal Box Model

Hiromasa Yoshizumi[1], Takaaki Koga[1], Masahiro Kozako[1], Masayuki Hikita[1], Yuuki Fujii[2], Yusuke Nakamura[2], Hiroaki Cho[2] ([1] Kyushu Institute of Technology, Japan, [2] Toshiba Corporation, Japan)

V2-20 [322] Study on Short Time Charge Behavior in Pulsed Residual Charge Method for Water Tree Diagnostics of XLPE Cables

Hiroyuki Futami[1], Nhet Ra[1], Tomohiro Kawashima[1], Yoshinobu Murakami[1], Naohiro Hozumi[1], Takashi Kurihara[2], Tatsuki Okamoto[2], Kazuhisa Miyajima[3], Katsumi Uchida[3] ([1] Toyohashi University of Technology, Japan, [2] Central Research Institute of Electric Power Industry, Japan, [3] Chubu Electric Power Co., Inc., Japan)

V2-21 [644] Analysis of Incipient Discharge Activity in Nano Particles Dispersed Ester Oil Insulation

Soumya Thakur[1], R. Sarathi[1], and Rumpee Bora[2] ([1] Department of Electrical Engineering, Indian Institute of Technology Madras, India, [2] Department of Electrical Engineering, National Institute of Technology, India)

MVP Group 2D Coordinator: T. Mori (Aichi Inst. Tech.)

V2-22 [260] Analysis of Series Arc Signal by Statistical Distribution Method in Railway Station Cable

Donguk Jang[1], Seonghee Park[2], and Kangwon Lee[1] ([1] Korea Railroad Research Institute, Korea, [2] Wonkwang University, Korea)

V2-23 [267] Experimental Investigations on Breakdown in Cable Insulation

D. Sathyamoorthy, C. C. Reddy (Indian Institute of Technology Ropar, India)

V2-24 [274] Effect of Elastomer Type on Electrical and Mechanical Properties of Polypropylene/Elastomer Blends

Y. Gao[1], J. Li[1], Y. Li[2], Y.Q. Yuan[1], S.H. Huang[1], B.X. Du[1] ([1] Tianjin University, China, [2] Design and Research Co. Ltd, China)

V2-25 [376b] Optimal Insulation Design for New-type Transmission Tower with Composite Cross-arm

Yong Zhu[1, 2], Liang Wang[2], Jie Yu[2], Jiang Fang[2] ([1] Taizhou University, China, [2] Jiangsu Shenma Electric Co. Ltd., China)

V2-26 [177c] A Health Index Model for Prioritization of Oil-Filled Cables

S.H. Kim[1], S.W. Lee[1], J.H. Heo[1], H.G. Park[1], E.C. Lee[1], C.S. Oh[1], J.S. Lim[1], J.W. Kang[2], C.K. Jung[2], H.S Park[2] ([1] Mok-Po National Maritime University, Korea, [2] KEPCO Research Institute, Korea)

V2-27 [235] Flashover Inception Voltage Characteristic on Polyimide Surface under Surge Voltage Application

Hiroaki Fujimoto, Tomohiro Kawashima, Masayuki Nagao, Naohiro Hozumi, Yoshinobu Murakami (Toyohashi University of Technology, Japan)

V2-28 [731] Analysis of water droplet initiated discharges on silicone rubber insulating material adopting Hilbert Huang Transform

Arun Keshav Sridhar[1], Palash Mishra[2], R. Jayaganthan[3], R. Sarathi[2] ([1] Department of Aerospace Engineering, Indian Institute of Technology Madras, India, [2] Department of Electrical Engineering, Indian Institute of Technology Madras, India, [3] Department of Engineering Design, Indian Institute of Technology Madras, India)

Poster Presentations

P2-01 [295c] Standardized Survey of Transformer Reliability

S. Tenbohlen[1], J. Jagers[2], F. Vahidi[1] ([1] University of Stuttgart, Germany, [2] Eskom Research, Testing & Development, South Africa)

P2-02 [218] Influence of Sample Thickness of Low-Density Polyethylene Film on Packet-like Charges Behavior and Dielectric Breakdown

Koichi Ota, Minori Kato, Hiroaki Miyake, Yasuhiro Tanaka (Tokyo City University, Japan)

P2-03 [226] Development of Semiconductor Sensor as a Use for Pulsed Electro-Acoustic Method

Keita Sonoda[1], Kosuke Saito[1], Hiroaki Miyake[1], Yasuhiro Tanaka[1], Kentarou Sawano[1], Takuya Maruizumi[1], Hideki Koshiishi[2] ([1] Tokyo City University, Japan, [2] Japan Aerospace Exploration Agency, Japan)

P2-04 [239] Study on Conduction Current Characteristics of Corona-resistant Polyimide Film Before and After Thermal Aging

Yading Chen, Yalin Wang, Jiandong Wu, Yi Yin (Shanghai Jiao Tong University, China)

P2-05 [243] Electrical Charges and Currents Distribution Analysis in Plaque Samples by the DCIC-Q(t) Method

Yoitsu Sekiguchi[1], Masumi Fukuma[2] ([1] Sumitomo Electric Industries, Ltd., Japan, [2] National Institute of Technology, Matsue College, Japan)

P2-06 [290] Investigation on Space Charge Behavior in Water Tree Aged Crosslinked Polyethylene (XLPE) Cable by Experiment and Simulation

Yu Zhang, Deyuan Liu, Jiandong Wu, Yi Yin (Shanghai Jiao Tong University, China)

P2-07 [296a] Effects of Nonlinear Condcutivity on Interface Charge in HVDC Cable Accessories

Cheng Zhang[1], Boxue Du[1], Jin Li[1], Hucheng Liang[1], Zhonglei Li[1], Yunqi Xing[2], Yu Gao[1] ([1] Tianjin University, China, [2] Hebei University of Technology, China)

P2-08 [296b] Trap Dependent Interface Charge Behaviors of Fluorinated HVDC Cable Accessories

Chenlei Han[1], Boxue Du[1], Jin Li[1], Tao Han[1], Xiaolong Li[2], Yong Liu[1], Shiyu Liu[1] ([1] Tianjin University, China, [2] Shenyang University of Technology, China)

P2-09 [313] Space Charge Formation Related to the Structural Relaxation of SiO_2/LDPE Nanocomposite

Jiaming Yang[1], Shuhong Xie[2], Hong Zhao[1], Ming Hu[3], Changji Zheng[1], Weichao Zhang[1], Xuan Wang[1] ([1] Harbin University of Science and Technology, China, [2] Jiangsu Zhongtian Technology Co., Ltd., China, [3] Zhongtian Technology Submarine Cable Co., Ltd., China)

P2-10 [333] Space Charge Behavior of Different Insulating Materials Employed in AC and DC Cable Systems

Antonino Imburgia[1], Pietro Romano[1], Eleonora Riva Sanseverino[1], Fabio Viola[1], Naohiro Hozumi[2], Shosuke Morita[2] ([1] University of Palermo, Italy, [2] Toyohashi University of Technology, Japan)

P2-11 [338b] Automatic Measurement System for Space Charge Distribution in HVDC Model Cable

Jongmin Kang[1], Seung Hwangbo[2], Woomin Min[2], Hyuncheol Jung[2], Jundo Park[2] ([1] Honam Uni., Korea, [2] Gwangju Korea, Korea)

P2-12 [389b] The Transition of Partial Discharge to Homogeneous Discharge in Nitrogen at Low Pressure

Yan Du, Kai Wu, Yongpeng Meng, Wenjin Song, Xin Yang (Xi'an Jiaotong University, China)

P2-13 [120] Effect of Thickness on Space Charge Behavior in XLPE under Different Temperature

Kaiyu Qian[1], Jiandong Wu[1], Weikang Li[2], Yi Yin[1] ([1] Shanghai Jiao Tong University, China, [2] Global Energy Interconnection Research Institute, China)

P2-14 [177a] Evaluation of Long-Term Reliability of Power Cable Including Nano-Conductive Layer

J.H. Heo[1], H.G. Park[1], E.C. Lee[1], C.S. Oh[1], S.W. Kim[1], S.W. Lee[1], J.S. Lim[1], K.H. Lee[2], S.H. Choi[2] ([1] Mok-Po National Maritime University, Korea, [2] Taihan Electric Wire Corporation, Korea)

P2-15 [178] Comparative Study of Mechanical and Electrical Strength of Kraft Paper in Nanofluid Based Transformer Oil and Mineral Oil

Mrutyunjay Maharana[1], Niharika Baruah[2], Sisir Kumar Nayak[2], Niranjan Sahoo[3] ([1] Centre for Energy, Indian Institute of Technology, India, [2] Department of Electronics & Electrical Engineering, Indian Institute of Technology, India, [3] Department of Mechanical Engineering, Indian Institute of Technology, India)

P2-16 [231] Effects of Addition of MgO Fillers with Various Sizes and Co-addition of Nano-sized SiO_2 Fillers on the Dielectric Properties of Epoxy Resin

Ryosuke Yanashima[1], Naoshi Hirai[2], Yoshimichi Ohki[1, 2] ([1] Department of Electrical Engineering and Bioscience, Waseda University, Japan, [2] Research Institute for Materials Science and Technology, Waseda University, Japan)

P2-17 [271] Preparation of Fullerene/Epoxy Resin Composite with Fine Dispersion and Its Breakdown Strength

Shota Harada[1], Masahiro Kozako[1], Masayuki Hikita[1], Takeshi Igarashi[2], Hiroaki Kaji[2] ([1] Kyushu Institute of Technology, Japan, [2] Showa Denko K.K., Japan)

P2-18 [277] Investigation on Electrical Treeing Characteristics of XLPE Containing ZnO Nano-Filler

Noor Syazwani Mansor[1], D. Ishak [1], M. Mariatti[2], H. S. A. Halim[3], A. B. A. Basri[3], M. Kamarol[1] ([1] School of Electrical and Electronic Engineering, Universiti Sains Malaysia, Malaysia, [2] School of Material and Mineral Resources Engineering, Universiti Sains Malaysia, Malaysia, [3] TNB Research, Malaysia)

P2-19 [179] Study on Insulation Deterioration Diagnosis by Partial Discharge in IEC (b) Electrode

Satoru Ansai, Tatsuki Okamoto, Masafumi Yashima (Tohoku University, Japan)

P2-20 [208] Evolution of PD Properties till Breakdown in Silicon Nitride Substrate Molded with Resin

Yuya Akinaga[1], Junya Maki[1], Masahiro Kozako[1], Masayuki Hikita[1], Yoko Nakamura[2], Katsumi Taniguchi[2], Tadanari Ikeda[2], Kenji Okamoto[2] ([1] Kyushu Institute of Technology, Japan, [2] Fuji Electric Co., Ltd., Japan)

P2-21 [263] Propagation Characteristics of Acoustic Wave Induced by Partial Discharge in IGBT Module

Jyunya Maki[1], Yuya Akinaga[1], Masahiro kozako[1], Masayuki Hikita[1], Yoko Nakamura[2], Katsumi Taniguchi[2], Yoshinari Ikeda[2], Kenji Okamoto[2] ([1] Kyushu Institute of Technology, Japan, [2] Fuji Electric Co., Ltd., Japan)

P2-22 [268a] Design of an Integrated Conformal Partial Discharge Senor for Inspection Robot Used in Substations

Jianwen Wang[1], Yue Hu[1], Feng Xue[2], Dongliang Wei[2] ([1] Shanghai Jiao Tong University, China, [2] Guangdong Power Grid Corporation Limited, China)

P2-23 [268b] Simulation on Air-gap Discharge Based on PIC-MCC Method

Hongyi Huang[1], Yue Hu[1], Feng XUE[2], Dongliang WEI[2] ([1] Shanghai Jiao Tong University, China, [2] Guangdong Power Grid Corporation Limited, China)

P2-24 [395] Sensitivity Characteristics of Partial Discharge Electromagnetic Sensor Located in Stator Core

Tomohiro Kubo[1], Tomoki Uchimura[1], Masahiro Kozako[1], Masayuki Hikita[1], Takahisa Ueno[2], Jintong Sun[3], Aoto Izumi[3], Kazunari Karasawa[3], Tatsuya Hirose[4], Satoshi Hiroshima[4] ([1] Kyushu Institute of Technology, Japan, [2] National Institute of Technology Oita College, Japan, [3] Toshiba Mitsubishi-Electric Industrial Systems Corporation, Japan, [4] Toshiba Corporation, Japan)

10:40 - 12:05 ***Session K: Space Charge #2 (Oral Room #2, 4th floor)***

Chair: Y. Yin (Shanghai Jiaotong Univ.)

K1 (SI) [389a] A Numerical Simulation Model for Oil Flow Electrification under DC Voltage

Jie Dai, Kai Wu, Yingye Jiang, Chuanhui Cheng, Jun Zhou (Xi'an Jiaotong University, China)

K2 [161] A Study on Electric Charge Behaviors in Polymeric Materials Using "Direct Current Integrated Charge Method"

Yoitsu Sekiguchi[1], Tatsuo Takada[2], Hiroaki Miyake[2], Yasuhiro Tanaka[2] ([1] Sumitomo Electric Industries, Ltd., Japan, [2] Tokyo City University, Japan)

K3 [118] AC Breakdown Properties of Vegetable-Oil-Based Insulating Fluid over 100°C

Kosuke Kamidani, Yushi Hiramatsu, Yuji Muramoto (Meijo University, Japan)

K4 [091] Equivalence Analysis of Space Charge Measurements Based on Pulsed Electroacoustic Measurement for Flat Samples and Coaxial Cables

Xia Wang, Jia-qi Hao, Jin-zhou Xiong, Kai Wu (Xi'an Jiaotong University, China)

12:00 – 13:00 ***Lunch Break***

13:00 - 14:25 ***Session L: Degradation #2 (Oral Room #2, 4th floor)***

Chair: S. Holé (Univ. Pierre et Marie Curie-ESPCI)

L1 (SI) [155] Effects of Thermal Aging on Paper Characteristics in Paper-Mineral Oil Composite Insulation

Suwarno, Rizky Pasaribu (Institut Teknologi Bandung, Indonesia)

L2 [258] Properties Analysis of Insulation Breakdown by Thermal Degradation Test for Insulation Papers

Seong-Hee Park[1], Dae-Hee Park[1], Dong-Uk Jang[2] ([1] Wonkwang University, Korea, [2] Korea Railroad Research Institute, Korea)

L3 [295a] Electrical Conductivity of Oil and Oil-impregnated Pressboard dependent on Aging Byproducts

Farzaneh Vahidi[1], Stefan Tenbohlen[1], Kevin Rapp[2], Alan Sbravati[2] ([1] University of Stuttgart, Germany, [2] Cargill Inc. Plymouth, USA)

L4 [172] Insulation Performance of Safety-related Cables for Nuclear Power Plants under Simulated Severe Accident Conditions

Takefumi Minakawa[1, 4], Masaaki Ikeda[1], Naoshi Hirai[3], Yoshimichi Ohki[2, 3, 4] ([1] Secretariat of Nuclear Regulation Authority, Japan, [2] Department of Electrical Engineering and Bioscience, Waseda University, Japan, [3] Research Institute for Materials Science and Technology, Waseda University, Japan, [4] Joint Major in Nuclear Energy, Waseda University, Japan)

15:20 - 17:25 ***Session M:Material Properties #2 (Oral Room #1, 9th floor)***

Chair: June-Ho Lee (Hoseo Univ.), Co-chair: N. Hozumi (Toyohashi Univ. Tech.)

M1 [150] Investigation of the Molecular Dynamics in Epoxy Resin Systems Using the Effect of Different Functional Groups on the Dynamics of Micromolecular Networks

Istebreq A. Saeedi, Alun S. Vaughan, Thomas Andritsch, Orestis Vryonis (University of Southampton, UK)

M2 [166] Dependence of Pearl-chain Type Tree in Silicone Gel on The Waveform and the Frequency of Applied Voltage

Masaharu Fujii, Haruo Ihori, Jeon Hyeon-Gu (Ehime University, Japan)

M3 [121] Electrical Properties of Composites with Microvaristors and Several Secondary Fillers

Hidehito Matsuzaki, Toshiyuki Nakano, Tetsushi Okamoto, Hideyasu Ando, Motoharu Shiiki, Masafumi Takei (Toshiba Corporation, Japan)

M4 [245] Influence of Test Method and Gas Pressure on Negative Lightning Impulse Breakdown Voltage in Ultra-Pure Water

Norimitsu Takamura, Nobutaka Araoka, Seiya Kamohara, Yuta Hino, Takuya Beppu, Masahiro Hanai (Fukuoka University, Japan)

M5 [442] Some Basic Electrical Properties of Thermoplastic Insulators for Eco-friendly Power Cable

**Presentation of Korea/Japan Student Exchange Program*

Chul-Ho Kim[1], June-Ho Lee[1], Woo-Min Min[2], Seung Hwangbo[2], Jeong-Tae Kim[3], Seung-Ik Jeon[4] ([1] Hoseo Univ., Korea, [2] Honam Univ., Korea, [3] Daejin Univ., Korea, [4] LS Cable and System, Korea)

15:20 - 17:20 ***Session N: Measurement Techniques (Oral Room #2, 4th floor)***

Chair: M. Ikeda (Nucl. Reg. Auth., Japan)

N1 [089] Experimental Evaluation and Simulations of X-wax in Transformer Bushings

Orlando Girlanda[1], Lars Jonsson[2], Kenneth Johansson[1], Karin Gustafsson[1], Bertil Samuelsson[1] ([1] ABB AB, Corporate Research, Sweden, [2] ABB AB, Components, Sweden)

N2 [087] Experimental Study on Electrical Evaluation of Rotor Insulation System of DFIG for Wind Power Generations

Meng Wang[1], Xuezhong Liu[1], Rui Zhang[1], Jianbo Han[1], Pingzhen Lei[2], Guanfang Liu[2], Yong Zhao[3], Bin Han[3] ([1] Xi'an Jiaotong University, China, [2] CRRC Yongji Electric Co., Ltd., China, [3] Xi'an Thermal Power Research Institute Co., Ltd., China)

N3 [190] Correlation between Indenter Modulus and Elongation-at-break Observed for Four Electrical Insulating Polymers

Naoshi Hirai[1], Yoshimichi Ohki[1, 2] ([1] Research Institute for Materials Science and Technology, Waseda University, Japan, [2] Department of Electrical Engineering and Bioscience, Waseda University, Japan)

N4 [125] A Pre-warning Method of Contamination Flashover Based on the Leakage Current of Insulators in Dry Condition

Lijun Jin[1], Zhiyuan Xu[1], Shengmeng Zhang[2] ([1] Tongji University Shanghai, China, [2] Zhejiang Guanhua Electric Co. Ltd., China)

N5 [063a] A Method to Improve Lightning Performance of Transmission Lines in High Footing Resistance Areas

Nam V Ninh[1, 3], Thinh Pham[2], Top V. Tran[1] ([1] Hanoi University of Science and Technology, Vietnam, [2] Underground Systems Inc., USA, [3] Hanoi University of Industry, Vietnam)

N6 [100] Temperature Measurement Method for Dielectric Layer Characterization in a High Voltage Vacuum Prober

Vincent Bley, Sorin Dinculescu, Marie-Laure Locatelli, Benoît Schlegel (Université de Toulouse, CNRS, France)

18:30 - 20:30 ***Symposium Banquet and Closing Remarks (at Hotel Arc Riche Toyohashi, 5th Floor, Room 'Grace')***

The Room will open at around 18:00

Fri. Sept. 15th

9:00 - ***IEEE DEIS Summer School*** ***Application is required.***

Guide: T. Kawashima (Toyohashi Univ. Tech.)

Meeting place: Toyohashi Railway Station.

12:30 - ***Technical Tour (Lunch is not included)*** ***Application is required.***

Guide: Y. Murakami, N. Hozumi (Toyohashi Univ. Tech.)

Meeting place: Toyohashi Railway Station.

Sept. 13th 13:30-17:30 and Sept. 14th 10:40-15:00

SS (Sun-Shine) Session

Coordinator: Y. Hayase (Fuji Electric)

SS-1 [108] Nano Silica Epoxy Dispersion which Represents High Voltage Endurance Performance
Naohiko Suemura, Masatoshi Sugisawa, Kenji Tanimoto, Ichitaro Kikunaga, Takashi Sonoda (Nissan Chemical Industries, Ltd., Japan)

SS-2 [224] Improvement of V-t Characteristics by Nano-filler Dispersion in Stator Winding Insulation
Hiromitsu Hirai[1], Takahiro Imai[1], Shinsuke Kikuta[2], Tetsuo Yoshimitsu[2] ([1] Toshiba Corporation, Japan, [2] Toshiba Mitsubishi-Electric Industrial Systems Corporation, Japan)

SS-3 [233] Consideration of Dicyclopentadiene Resin Application to Insulation Materials of Molded Coil
Yusuke Nakamura, Takahiro Imai, Miwa Takeuchi (Toshiba Corporation, Japan)

SS-4 [211] Development of 154kV and 275kV Polymer Bushings for Transformers
Naoki Tanaka, Kenji Sato, Kazuhiro Tsuji (NGK Insulators, Ltd., Japan)

SS-5 [362] Advanced Diagnostic Technologies for Underground Power Cable System Developed by CRIEPI
Toshihiro Takahashi, Yuta Makino, Takashi Kurihara (Central Research Institute of Electric Power Industry, Japan)

SS-6 [246] Study on the Transformer Abnormality Diagnosis and Deterioration Diagnosis by Vibration Measurement
Yoshinori Konishi[1], Masamichi Kato[1], Masayuki Hasegawa[1], Hiroshi Kitagawa[2], Satoshi Matsumoto[2] ([1] Yuka Industries Co., Ltd., Japan, [2] Shibaura Institute of Technology, Japan)

SS-7 [244] Development of Electrical Insulation Diagnostic Techniques for Medium-voltage Switchgear
Hiroaki Cho, Yusuke Nakamura, Yuuki Fujii, Yukio Takanohashi (Toshiba Corporation, Japan)

SS-8 [217] Corona Protection In High Voltage Electric Machines
Shusaku Suzuki, Hiroki Hanai (Shinseishoji Co., Ltd., Japan)

SS-9 [286] Introduction of All-in-one Partial Discharge Detector. Type B010
Ryuya Asagi, Takuya Tomizawa, Takeshi Ato, Terutsugu Tsunekage (Fujikura Dia Cable Ltd., Japan)

SS-10 [302] Partial Discharge Analyzer. Usefulness of Partial Discharge Wave Analysis of Insulation System
Yashuhiro Nakayama (Soken Electric Co. Ltd., Japan)

SS-11 [228] Mechanical-Electrical Composite Design of the Insulating Substrate in Power Semiconductors for High-Voltage Applications
Yuji Hayase, Keisuke Yamashiro, Tetsumi Takano (Fuji Electric Co., Ltd., Japan)

Demonstration Session for Measurement and Diagnosis

Coordinator: Y. Murakami (Toyohashi Univ. Tech.)

DM-1 [347b] Current Integrated Charge Technique for Evaluation of Water-Tree Degraded Cable
Takashi Kurihara[1], Shugo Yoshida[2], Tatsuo Takada[2], Yasuhiro Tanaka[2], Weiwang Wang[2, 3], Takashi Inoue[4] ([1] Central Research Institute of Electric Power Industry, Japan, [2] Tokyo City

University, Japan, [3] Xi'an Jiaotong University, China, [4] A&D Company, Limited, Japan)

DM-2 [347a] Basis System of Current Integrated Charge Technique for Charge Accumulation Properties of Insulation Dielectrics under DC Electric Stress

Tatsuo Takada[1], Keita Sonoda[1], Yasuhiro Tanaka[1], Weiwang Wang[1, 2], Yoitsu Sekiguchi[3], Takashi Inoue[4] ([1] Tokyo City University, Japan, [2] Xi'an Jiaotong University, China, [3] Sumitomo Electric Industries, Ltd., Japan, [4] A&D Company, Limited, Japan)

DM-3 [342] Current Distribution Measurement under Non-uniform Electric Field by Current Integration Meter

Masumi Fukuma[1], Yoitsu Sekiguchi[2] ([1] National Institute of Technology, Matsue College, Japan, [2] Sumitomo Electric Industries, Ltd., Japan)

DM-4 [557] Fault Location Attempts by Frequency Domain Reflectometry

Naoshi Hirai[1], Yoshimichi Ohki[1, 2] ([1] Research Institute for Materials Science and Technology, Waseda University, Japan, [2] Department of Electrical Engineering and Bioscience, Waseda University, Japan)

DM-5 [361] Influence of Surface Charge on Insulating Sheet on Partial Discharge Inception Voltage

Tomohiro Kawashima, Hideyuki Takahagi, Ryoto Kubota, Yoshinobu Murakami, Naohiro Hozumi, Masayuki Nagao (Toyohashi University of Technology, Japan)

DM-6 [314] Digital Impulse Winding Tester with Micro Wave PD Sensor DWX-xxPD

Kiyoshi Umezu, Akira Takeshita (ECG Kokusai Co., Ltd., Japan)

DM-7 [1319] Repetitive Impulse Voltage Supply and Automatic RPDIV Measuring System

Kiyoshi Umezu[1], Akira Takeshita[1], Masayuki Hikita[2], Masahiro Kozako[2], Takahisa Ueno[3] ([1] ECG Kokusai Co., Ltd., Japan, [2] Kyushu Institute of Technology, Japan, [3] National Institute of Technology, Oita College, Japan)

DM-8 [1000] Space Charge Measurement System for Full-scale HVDC Cables

Naohiro Hozumi (Toyohashi University of Technology, Japan)

Digest Report from Cooperative Research Committee and Investigating R&D Committees (No presentations except for DR-1)

DR-1 [1172] Digest Report of Cooperative Research Committee on EINA Magazine

Masayuki Nagao[1], Yoshiyuki Inoue[2], Masahiro Kozako[3] ([1] Toyohashi Univ. of Technology, Japan, [2] Toshiba Mitsubishi-Electric Industrial Systems Corporation, Japan, [3] Kyusyu Institute of Technology, Japan)

DR-2 [1208] Digest Report of Investigation Committee for Standardization of Calibration and Advanced Measurements for Space Charge Distribution at High Temperature using Pulsed Electro-acoustic Method

Yasuhiro Tanaka[1], Hiroaki Uehara[2], Yoshinobu Murakami[3], Hiroki Mori[4] ([1] Tokyo City Univ., Japan, [2] Kanto Gakuin Univ., Japan, [3] Toyohashi Univ. of Tech., Japan, 4 Furukawa Electric Co., Ltd., Japan)

DR-3 [530] Digest Report of the Investigation Committee on Insulation Diagnosis Technologies for Electric Power Apparatus and Equipment Using New and Practicable Insulation Materials

Yoshiyasu Ehara[1], Takashi Kurihara[2] ([1] Tokyo City Univ., Japan, [2] CRIEPI, Japan)

DR-4 [507] Digest Report of Investigating R&D Committee on Electrical Insulation Technologies at Cryogenic Temperatures

Naoki Hayakawa[1], Takato Masuda[2], Yasushi Yamano[3], Tomohiro Kawashima[4], ([1] Nagoya University, Japan, [2] Sumitomo Electric Industries, Ltd., Japan, [3] Saitama University, Japan, [4] Toyohashi University of Tech., Japan)

DR-5 [359] Digest Report of Investigating R&D Committee on Advancing Tailor-made Composite Insulation Materials

Toshikatsu Tanaka[1], Masahiro Kozako[2], Takahiro Imai[3], Muneaki Kurimoto[4] ([1]Waseda University, Japan, [2] Kyusyu Institute of Technology, Japan, [3] Toshiba Corporation, Japan, [4] Nagoya University, Japan)

DR-6 [480] Digest Report of Investigating R&D Committee on Advanced Nanostructure Control for High-Performance Organic Devices and Life Science

Keizo Kato[1], Shin-ichro Nakajima[2], Yusuke Aoki[3], Akira Baba[4] ([1] Niigata University, Japan, [2] Japan Aviation Electronics Industry Ltd., Japan [3] Mie University, Japan, [4] Niigata University, Japan)