



**2014 INTERNATIONAL SYMPOSIUM ON ELECTRICAL  
INSULATING MATERIALS**

**June 1-5, 2014, Niigata City, Japan**

**Sponsored by**

**IEEJ Technical Committee on Dielectrics and Electrical Insulation**

**Technically Co-sponsored by**

**IEEE Dielectrics and Electrical Insulation Society**

**Co-sponsored by**

**Faculty of Engineering, Niigata University  
Waseda University**

**In cooperation with**

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**Final Program**

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Chair: K. Kato (Niigata Univ.)

Members: K. Shinbo, A. Baba (Niigata Univ.), and N. Fuse (CRIEPI)

## **Workshop "Analysis for Polymeric Insulating Materials Using Advanced Numerical Simulation (APIANS)"**

Chair: T. Tanaka (Waseda Univ.)

Assistant Coordinator: A. Kumada (The Univ. Tokyo) and M. Kozako (Kyushu Inst. Tech.)

## **Demonstration of PEA Measurement Systems**

Event Director: Y. Murakami (Toyohashi Univ. Tech.)

Event Assistant Director: H. Miyake (Tokyo City Univ.)

# Conference Information

ISEIM 2014 will be held in Niigata, Japan on June 1-5, 2014. The previous conferences were held in Tokyo (1995), Toyohashi (1998), Himeji (2001), Kitakyushu (2005), Yokkaichi (2008), and Kyoto (2011), all in Japan. The organizing committee cordially invites you to participate in the conference.

## About Niigata

Niigata City is a beautiful "city of water", and serves as a transportation hub with a seaport, an airport, Shinkansen stations, and highways. Various sightseeing spots are scattered throughout the suburbs, such as Iwamuro Hot Spring. The City is proud of its variety of wonderful foods, such as seafood nurtured by the Sea of Japan, rice and sake. The conference venue Toki Messe is in the new district of Niigata City. From its observatory, the highest spot in the city, you can see the Shinano River, the Sea of Japan, and Sado Island in the distance.

## 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 of "APIANS (Analysis for Polymeric Insulating Materials Using Advanced Numerical Simulation)"

In this workshop, we can have several lecturers focusing on the followings.

- ◇ Numerical calculation for band energy structures of polymers using molecular orbital method or others.

- ◇ Numerical analysis for mechanical structures of polymers using finite element method or others.
- ◇ Numerical simulation of charge storage and transportation processes in polymers using advanced computing techniques.
- ◇ Numerical simulation for growth of tree in polymers based on fractal models or others.
- ◇ Other numerical approaches for analysis of polymeric characteristics as insulating materials.

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

### **Special Sessions for Space Charge Measurement Technologies**

The broad HVDC power network is getting to move forward with full-scale implementation, especially in Europe area. In order to estimate the HVDC stress on insulating materials, space charge distribution with the pulsed electro-acoustic (PEA) method - based measurement has been paid much attention. The organizing committee is planning to hold a special session introduces the advanced technique for measuring the space charge distribution in insulating material using PEA method.

- ◇ *Special Oral Session:* One or two oral sessions will be held during the symposium, including key note lectures by invited speakers.
- ◇ *Tutorial Program:* This is a practice program to learn the basic space charge measurement for beginners using standard measurement system. Participants can touch the conventional PEA system and learn the procedure of measurement and calibration step by step, conform to the IEC Technical Specification (IEC/TS 62758) procedure.
  - *Note: audiences who want to take part in this program are needed to apply through the registration system.*
- ◇ *Demonstration Session:* This is a demonstration session of advanced measurement systems brought by some researchers in Japan. Following eight types of state-of-the-art PEA systems will be gathered and audiences can see how they work.
  - *Note: Most of the measurement systems cannot be operated or controlled by audiences. It would also be dangerous during the voltage application. Please follow instructions provided at the conference. The organizing committee is not responsible for any damages if the audience does not follow them.*

### **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 are now starting 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. The winner's presentation will be held in Oral I, Several Properties Session in ISEIM 2014.

### Language

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

### Registration Fee

Registration fee is changed from the one informed on call for papers due to increase in consumption tax and in the number of social events. Organizing committee ask all the attendees to kindly be understand the situation. Note that lectures invited for Inuishi Memorial, Plenary, Session Invited, Japan-Korea Young Researcher Exchange Program, and workshop APIANS are exempt from mandatory registration charges.

		Members <sup>a)</sup>	Non-Members
Mandatory registration	Normal registration <sup>b)</sup>	40,000 JPY	45,000 JPY
	Students <sup>b, c)</sup>	20,000 JPY	
	Registration only for the paper <sup>d)</sup>	10,000 JPY	
Options	Workshop APIANS participation fee	3,000 JPY	
	PEA measurement tutorial participation fee	2,000 JPY	
	Technical Tour Ticket	1,000 JPY	
More options	Banquet Ticket for Accompanying Person	5,000 JPY	
	Additional Proceedings	10,000 JPY	

<sup>a)</sup> Members of IEEJ, IEEE, CIGRE, CES, or KIEEME.

<sup>b)</sup> Services will be transferred as a set of proceeding booklet, a USB stick, a banquet ticket, some conference kits and other services at the conference. Due date of service transfer: At the conference (Jun. 1, 2014 - Jun. 5, 2014). Receipt is issued at the registration desk.

<sup>c)</sup> This includes booklet and USB stick of the symposium proceedings, one ticket for banquet.

<sup>d)</sup> 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.

### Technical Tour (Bus tour from the conference venue, at 11:45 a.m. of Jun. 4<sup>th</sup>)

Only one technical tour, which rounds the following three sites, will be provided. *Those who are interested in can apply through the registration system.*

1) Tohoku Electric Power Co., Inc., Higashi Niigata Thermal Power Station: An anti-fouling system has been added

to the 1610 MW CCGT plant at Higashi Niigata, Japan. This plant, which increased the station's total capacity to 4600 MW, was Japan's first large CCGT project and is operated by Tohoku Electric Power Co., Inc.. The plant was suffering from fouling which restricted flow through the plant's water outflow structure, affecting productivity levels and efficiency. The problem was solved by applying anti-fouling coatings in 2005. The power station was the first to be equipped with a new generation of Mitsubishi gas turbines. Mitsubishi Heavy Industries installed a combined cycle power plant (Unit 4) that has a turbine inlet that can handle temperatures of up to 1450°C. Before the turbine began commercial operation in 1999, the plant had a capacity of 2990 MW. The existing installation comprised two 350 MW steam turbines (Minato units one and two), two 600 MW steam turbines (Units 1 and 2) and a 1090 MW CCGT (Unit 3). Unit 3 was completed in 1984; it has six MW701D gas turbines and was Japan's first large CCGT plant.

2) NAMICS Corporation, a company that produces conductive and insulating products for electronic components and systems: This company has developed insulating materials for disc ceramic capacitors since late 1960's. The company has also developed conductive materials such as silver pastes for electrodes, and semiconductor sealing. It is rare case to conduct research and development both for insulating and conductive materials. Recent featured products are; 1) 'NCP' that realizes the short-time hardening, 2) 'ANCP' that can perform the solder joining and resin sealing at the same time, and 3) a adhesion film that can fit to high frequency and light model semiconductor passiveness.

3) Imayotsukasa Syuzo, Sake Brewery: Imayotsukasa was founded in 1767. At the Imayotsukasa sake factory, only Niigata's natural "Suganadake" spring water is used to make sake. Using this spring water and high quality sake rice, the sake is made with great care and has a strong, delicious flavor, even when compared to other dry sake. The historic factory building was built around 1900. Tours will take you through each stage of the sake brewing process, and visitors get to learn about the warehouses. After the tour finishes, there will be sake tasting. Come learn about the process of making sake and try some for yourself.

### **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 2014 proceedings includes digest results of these efforts.

### **ISEIM 2014 Web Site**

<http://www2.iee.or.jp/~adei/ISEIM2014/>

# The Way of Presentation

All papers accepted for ISEIM 2014 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 same to the Japan-Korea exchange program. 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. 2.1 m and a width of 1.2 m. 'A-zero' size posters will be suitable. Thumbtacks will be provided by the conference secretariat.

Schedule for #1 Session:      13:00 – 15:30, Jun. 3<sup>rd</sup>: preparation  
   15:45 – 17:30, Jun. 3<sup>rd</sup>: presentation  
   17:30 – 17:50, Jun. 3<sup>rd</sup>: removing

Schedule for #2 Session:      8:30 – 9:30, Jun. 4<sup>th</sup>: preparation  
   9:30 – 11:15, Jun. 4<sup>th</sup>: presentation  
   11:15 – 11:35, Jun. 4<sup>th</sup>: removing

All the presentation materials remained at 8:30 a.m., Thursday, Jun. 5<sup>th</sup> 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. 2.1 m and a width of 1.2 m. 'A-zero' size posters will be suitable. Thumbtacks 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:      13:00 – 15:30, Jun. 3<sup>rd</sup>: preparation  
   15:45 – 17:30, Jun. 3<sup>rd</sup>: presentation  
   17:30 – 17:50, Jun. 3<sup>rd</sup>: removing  
Schedule for #2 Session:      8:30 – 9:30, Jun. 4<sup>th</sup>: preparation  
   9:30 – 11:15, Jun. 4<sup>th</sup>: presentation  
   11:15 – 11:35, Jun. 4<sup>th</sup>: removing

All the presentation materials remained at 9:00 a.m., Thursday, Jun. 5<sup>th</sup> 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 his/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

	Room $\alpha$ (Main Hall A)	Room $\beta$ (Main Hall B)	Room $\gamma$ (201B)	Room $\delta$ (201A)	WS room (303)	Others
Jun. 1 <sup>st</sup> (Sun.)					<b>Workshop APIANS</b> 14:00-17:00	<b>Registration</b> at Atrium, 2 <sup>nd</sup> floor of Toki Messe 13:00-17:30
						<b>Welcome Party</b> , at 30 <sup>th</sup> Floor of Hotel Nikko Niigata, 18:00-20:00
Jun. 2 <sup>nd</sup> (Mon.)	<b>Opening Address</b> <b>Inuishi Lecture</b> 9:00-10:20					<b>Registration</b> in front of Room $\alpha$ 8:00-17:00
	Coffee Break					
	<b>Plenary Lecture</b> 10:40-11:40					
	Lunch Break					
	Oral A <b>Nano-composite #1</b> 13:00-15:05		Oral B <b>Inverter and Partial Discharges</b> 13:00-14:50			
	Coffee Break					
Oral C <b>Nano-composite #2</b> 15:20-17:00				<b>PEA Tutorial</b> 15:30-17:00		
Jun. 3 <sup>rd</sup> (Tue.)	Oral DA <b>Space Charge</b> 9:00-10:50					<b>Registration</b> in front of Room $\alpha$ 8:00-17:00
	Coffee Break					
	Oral DB <b>Space Charge</b> 11:00-12:30		Oral E <b>Outdoor Insulation and Diagnosis #1</b> 10:50-12:30			
	Lunch Break					
	Oral F <b>Outdoor Insulation and Diagnosis #2</b> 13:30-15:15				<b>PEA Demo</b> 13:30-15:30	
	Coffee Break					
Jun. 4 <sup>th</sup> (Wed.)	Oral G <b>Partial Discharge</b> 15:45-17:10	<b>MVP, Poster, &amp; SS #1</b> 15:45-17:30				
	Oral H <b>Several Properties #1</b> 9:00-11:30	<b>MVP, Poster, &amp; SS #2</b> 9:30-11:15				<b>Registration</b> in front of Room $\alpha$ 8:00-12:00
						<b>Technical Tour</b> 11:45-17:00
Jun. 5 <sup>th</sup> (Thu.)						<b>Banquet</b> , at 4 <sup>th</sup> Floor of Hotel Nikko Niigata, 18:00-20:00
	Oral I <b>Several Properties #2</b> 9:00-11:30		Oral J <b>Organic Mater.</b> 9:00-11:10			<b>Registration</b> in front of Room $\alpha$ 8:00-9:30
	<b>Closing Remarks</b> 11:40-11:50					

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

# Scientific Program

## Sun. Jun. 1

14:00 – 17:00 **Workshop APIANS (Workshop room, 3<sup>rd</sup> floor). Application is required.**

*Chair: T. Tanaka (Waseda Univ)*

(15:40 - 16:00 Short Break)

14:00 - 14:10 Chairman's Introduction

Toshikatsu Tanaka (Waseda Univ., Japan)

14:10 - 14:40 The Application of Computational Methods to the Design of Dielectric Materials and Systems

Steven A. Boggs (Univ. Connecticut, USA)

14:40 - 15:10 First Principle Simulations of Electronic Structure of Polymer Dielectrics

Mikael Unge (ABB, Sweden)

15:10 - 15:40 Determination of Charge-Trapping Sites in Saturated and Aromatic Polymers by Quantum Chemical Calculation

Tatsuo Takada (Tokyo City Univ., Japan)

16:00 - 16:30 Modeling Charge Transport and Storage in Polymeric Insulating Materials: Numerical Analysis, Optimization and Validation

Severine Le Roy (Univ. Toulouse, France)

16:30 - 17:00 Numerical Simulation Methods to Model Electron Trapping and Transport in Polyethylene at the Molecular Level

David Cubero (Univ. Sevilla, Spain)

13:00 – 17:30 **Registration (at Atrium, 2<sup>nd</sup> floor of Toki Messe)**

18:00 – 20:00 **Welcome party (at Hou-ou hall, 30<sup>th</sup> floor of Hotel Nikko Niigata)**

## Mon. Jun. 2

**Invited Lecture (Room  $\alpha$ )**

9:00 - 9:20 **Opening Address**

Yasuhiro Tanaka (Tokyo City Univ., Japan)

9:20 - 10:20 **Inuishi Memorial Lecture** *Chair: M. Nagao (Toyohashi Univ. Tech. )*

Z1 [026] Nanodielectrics - the First Decade and Beyond

J. Keith Nelson (Rensselaer Polytechnic Inst., USA)

10:20 - 10:40 **Break**

10:40 - 11:40 **Symposium Plenary Lecture** *Chair: Y. Tanaka (Tokyo City Univ.)*

Z2 [031] The Missing Link – The Role of Space Charge in Polymeric Insulation Lifetime

George Chen (University of Southampton, UK and Xi'an Jiaotong Univ., China)

11:40 - 13:00 **Lunch Break**

13:00 - 15:05 **Session A: Nano-composite #1 (Room  $\alpha$ )**

**Chair: J. K. Nelson (Rensselaer Polytechnic Inst.)**

- A1 (SI) [009] Modelling the Dielectric Permittivity of Nanocomposites – the Overlap Model  
Ioana Preda<sup>1,2</sup>, Jérôme Castellon<sup>1</sup>, Michel Fréchet<sup>2</sup>, and Serge Agnel<sup>1</sup> (<sup>1</sup>Univ. Montpellier, France, <sup>2</sup>Inst. Rec. d'Hydro Québec, Canada)
- A2 [021] Core-double-shell Structured Nanocomposite Dielectrics with High Permittivity and Low Loss for Electric Energy Storage  
Xingyi Huang<sup>1</sup>, Liyuan Xie<sup>1</sup>, Fei Liu<sup>1</sup>, and Pingkai Jiang<sup>1,2</sup> (<sup>1</sup>Shanghai Jiaotong Univ., China <sup>2</sup> Shanghai Eng. Center for Material Safety of Nuclear Power Equipment, China)
- A3 [017] Measuring and Modeling the Thermal Conductivity of Epoxy-boron Nitride Nanocomposites  
I. A. Tsekmes, R. Kochetov, P. H. F. Morshuis, and J. J. Smit (Delft Tech. Univ., the Netherlands)
- A4 [049] Space Charge and Conductivity Characteristics of CB/XLPE Nanocomposites  
Zhiyu Yan, Baozhong Han, Hong Zhao, Jiaming Yang, and Chunyang Li (Harbin Univ.Sci. Tech., China)
- A5 [055] Nano-composite Polymeric Insulating Material of Mixed Addition for Control of Treeing Deterioration  
Yoshiaki Yamano (Chiba Univ., Japan)
- A6 [135] A Numerical Approach for Analysis of Structure of Lower-permittivity Insulating Nanoporous Composite  
Muneaki Kurimoto, Yuu Yamashita, Takeyoshi Kato, and Yasuo Suzuoki (Nagoya Univ., Japan)

13:00 - 14:50 **Session B: Inverter and Partial Discharge (Room  $\gamma$ )**

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

- B1 (SI) [034] Acoustic Emission from Partial Discharges in Cable Termination  
Tadeusz Czaszejko and Jonathan Sookun (Monash Univ., Australia)
- B2 (SI) [084] Phase Resolved Measurement and Simulation of Partial Discharges in Solid and Liquid Insulating Materials  
Suwarno (Inst. Teknologi Bandung, Indonesia)
- B3 [007] Review of Stator Insulation Problems in Medium Voltage Motors Fed from Voltage Source PWM Drives  
G. C. Stone and I. Culbert (Iris Power, Canada)
- B4 [069] Measurement of Stress Grading Conductivity to 1.6 MV/m and 155°C Computation of Grading Power Density and Temperature Rise for PWM Waveforms  
Steven Boggs<sup>1</sup>, Akiko Kumada<sup>2</sup>, and Tetsuo Yoshimitsu<sup>3</sup> (<sup>1</sup>The Univ. Connecticut, USA, <sup>2</sup>The Univ. Tokyo, Japan, <sup>3</sup>Toshiba Mitsubishi-Electric Industrial Systems Co., Japan)
- B5 [122] Partial Discharge Characteristics of Twisted Magnet Wire under High Frequency ac Voltage  
Satoshi Matsumoto, Nguyen Nhat Nam, Daichi Nagaba, and Takahiro Ogiya (Shibaura Inst.

Tech., Japan)

15:20 - 17:00 **Session C: Nano-composite #2 (Room  $\alpha$ )**

**Chair: M. Fréchet (Inst. Rec. d'Hydro Québec)**

- C1 [023] Polyethylene-based Nanodielectric Containing Octaisobutyl Polyhedral Oligomeric Silsesquioxanes Obtained by Hexane Slurry Blending  
Meng Guo<sup>1</sup>, Michel Fréchet<sup>2</sup>, Nicole R. Demarquette<sup>1</sup>, Éric David<sup>1</sup>, Hugues Couderc<sup>1</sup>, and Jean-Christophe Daigle<sup>2</sup> (<sup>1</sup>École de Technologie Supérieure, Canada, <sup>2</sup>Inst. Rec. d'Hydro-Québec, Canada)
- C2 [058] Simulation of Space Charge Behavior in LDPE with a Modified of Bipolar Charge Transport Model  
Jiandong Wu, Li Lan, Zhe Li, and Yi Yin (Shanghai Jiaotong Univ., China)
- C3 [082] Effect of Relative Humidity on Surface Dielectric Breakdown of Epoxy Based Nanocomposites under Repeated Pulses  
Y. Gao, Y. K. Men, and B. X. Du (Tianjin Univ., China)
- C4 [120] Correlation between Trap Parameters and Breakdown Strength of Polyethylene/Alumina Nanocomposites  
Weiwang Wang and Shengtao Li (Xi'an Jiaotong Univ., China)
- C5 [145] Effects of Nano-alumina Hydrate Coating for Conductive Fillers on Dielectric Properties of Epoxy Composite Materials  
Masahiro Kozako<sup>1</sup>, Masayuki Hikita<sup>1</sup>, Masayoshi Sato<sup>2</sup>, Goro Sato<sup>2</sup>, Zarel Valdez-Nava<sup>3,4</sup>, Sombel Diahm<sup>3,4</sup>, and Thierry Lebey<sup>3,4</sup> (<sup>1</sup>Kyushu Inst. Tech., Japan, <sup>2</sup>Sato Res. Co., Japan, <sup>3</sup>Univ. Toulouse, France)

15:00 - 17:00 **PEA System Tutorial Program (Room  $\delta$ ) Application is required.**

**Lecturer: Y. Tanaka (Tokyo City Univ). Assistant: Y. Kohno (Five Lab.)**

**Tue. Jun. 3**

9:00 – 12:30 **Session D: Space Charge Special Oral (Room  $\alpha$ )**

**Chair: 9:00 – 10:50 Shengtao Li (Xi'an Jiaotong Univ.)**

**11:00 – 12:30 George Chen (Univ. Southampton)**

- DA1 (SI) [019] Evidence of Exciton Formation in Thin Polypropylene Films under ac and dc Fields and Relationship to Electrical Degradation  
Bo Qiao, Christian Laurent, and Gilbert Teyssebre (Univ. Toulouse and CNRS, France)
- DA2 (SI) [077] Investigation of Space Charge Behavior of HVDC XLPE Cables Using PEA Method  
Shuqi Li, Li Lan, Jiandong Wu, and Yi Yin (Shanghai Jiaotong Univ., China)
- DA3 [098] Space Charge Measurement for 27 mm Thick XLPE Sample in PEA Method  
Masumi Fukuma<sup>1</sup>, Hiroki Tomita<sup>1</sup>, and Takashi Maeno<sup>2</sup> (<sup>1</sup>Matsue Nat. College of Tech., Japan, <sup>2</sup>Nat. Inst. Information and Communications Tech., Japan)

- DA4 [099] Space Charge Formation and Conductivity Characteristics of PE and Oil Impregnated Paper under a Temperature Gradient  
Kai Wu<sup>1</sup>, Zepeng Lv<sup>1</sup>, Qingdong Zhu<sup>1</sup>, Xia Wang<sup>1</sup>, Yonghong Cheng<sup>1</sup>, and L.A. Dissado<sup>1,2</sup>  
(<sup>1</sup>Xi'an Jiaotong Univ., China, <sup>2</sup>Univ. Leicester, UK)
- DA5 [167] Quantum Chemical Studies on Interface Charge Transfer between Electrode and Polyethylene under Electrical Stress  
Tatsuo Takada, Hiroaki Miyake, Yasuhiro Tanaka, and Masafumi Yoshida (Tokyo City Univ., Japan)

(10:50 - 11:00 Short Break)

- DB1 (SI) [086] Role of External and Internal Parameters on the Space Charge Formation in Dielectrics  
Reddy C. C., Chahal J. S., Ashish Gupta, and Tiwana A. P. S. (Indian Inst. Tech. Ropar, India)
- DB2 (SI) [088] The Effect of Charge Recombination on Surface Potential Decay Crossover Characteristics of LDPE  
Shengtao Li (Xi'an Jiaotong Univ., China)
- DB3 [072] Breakdown Processes in Low Density Polyethylene and Cross-linked Polyethylene under dc High Stress  
Yasuhiro Tanaka<sup>1</sup>, Tsuyoshi Kato<sup>1</sup>, Hitoshi Suzuki<sup>1</sup>, Hiroaki Miyake<sup>1</sup>, and Takashi Maeno<sup>2</sup>  
(<sup>1</sup>Tokyo City Univ., Japan, <sup>2</sup>Nat. Inst. Information and Communication Tech., Japan)
- DB4 [119] Preliminary Measurements on Dielectric Materials by the Pulsed Electro-acoustic Method Using a Ring Electrode  
Virginie Griseri<sup>1</sup>, Jonathan Riffaud<sup>1</sup>, Takashi Maeno<sup>2</sup>, and Laurent Berquez<sup>1</sup> (<sup>1</sup>Univ. Toulouse, France, <sup>2</sup>Nat. Inst. Information and Communication Tech., Japan)

10:50 – 12:30 **Session E: Outdoor Insulation and Diagnosis #1 (Room  $\gamma$ )**

**Chair: Peter Morshuis (Delft Univ. Tech.)**

- E1 [020] Contrasting Analysis on Properties of Mechanical Fatigue and Solid Insulation during Aging Process  
Hailiang Lu<sup>1</sup>, Yifan Liao<sup>2</sup>, Xiaoqing Yuan<sup>1</sup>, Fuzeng Zhang<sup>2</sup>, Jingzhuo Zhang<sup>1</sup>, Bao Wen<sup>1</sup>, and Xishan Wen<sup>1</sup> (<sup>1</sup>Wuhan Univ., China, <sup>2</sup>Ultra High Voltage Eng. Tech., China)
- E2 [051] Diagnosis of Generator Stator Winding Insulation Based on Dissipation Factor Measurement  
Fei Liu, Xingyi Huang, and Pingkai Jiang, (Shanghai Jiao Tong Univ., China)
- E3 [123] The DGA Interpretation Method Using Relative Content of Characteristic Gases and Gas-ratio Combinations for Fault Diagnosis of Oil-immersed Power Transformers  
An-xin Zhao<sup>1,2</sup>, Xiao-jun Tang<sup>1</sup>, Zhong-hua Zhang<sup>1,3</sup>, and Jun-hua Liu<sup>1</sup> (<sup>1</sup>Xi'an Jiaotong Univ., China, <sup>2</sup>Xi'an Univ. Sci. Tech., China, <sup>3</sup>Nat. Inst. Metrology, China)
- E4 [117] Paper Moisture Variation vs. Mechanical Deformation Impacts on Transformer Frequency Response Spectrum  
Mehdi Bagheri, B. T. Phung, and Trevor Blackburn (Univ. New South Wales, Australia)

- E5 [071] Forces Affecting Metallic Particle Motion in GIS  
 Kenichi Nojima<sup>1</sup>, Xueqin Zhang<sup>1</sup>, Masayuki Sato<sup>1</sup>, Takanori Yasuoka<sup>1</sup>, Motoharu Shiiki<sup>1</sup>,  
 Masafumi Takei<sup>1</sup>, and S.A. Boggs<sup>2</sup> (<sup>1</sup>Toshiba Co., Japan, <sup>2</sup>Univ. Connecticut, USA)

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

13:30 - 15:15 **Session F: Outdoor Insulation and Diagnosis #2 (Room α)**

**Chair: Suwarno (Inst. Teknologi Bandung)**

- F1 (SI) [041] Experimental Investigation on the Role of Corrosive Sulphur on the Development of Partial Discharges in Power Transformers  
 A. P. Bramantyo<sup>1</sup>, F. Ciani<sup>2</sup>, S. Serra<sup>2</sup>, P. H. F. Morshuis<sup>3</sup>, A. Cavallini<sup>4</sup>, and G. C. Montanari<sup>2,4</sup>  
 (<sup>1</sup>Institut Teknologi Bandung, Indonesia, <sup>2</sup>Techimp SpA, Italy, <sup>3</sup>Delft University of Technology, the Netherlands, <sup>4</sup>University of Bologna, Italy)
- F2 [124] Study of Electric Field Distribution on 22 kV Insulator under Three Phase Energisation  
 Mu Liang and K. L. Wong (RMIT Univ., Australia)
- F3 [037] Highly Sensitive Detection of Distorted Points in a Cable by Frequency Domain Reflectometry  
 Naoshi Hirai and Yoshimichi Ohki (Waseda Univ., Japan)
- F4 [130] Study on Water Tree Degradation Diagnosis of XLPE Cable Using Charge Radar  
 MyonHwan Kim<sup>1</sup>, Taketo Unok<sup>1</sup>, Yoshinobu Murakami<sup>1</sup>, Masayuki Nagao<sup>1</sup>, Takashi Kurihara<sup>2</sup>,  
 Tatsuki Okamoto<sup>2</sup>, Kazuhisa Miyajima<sup>3</sup>, Katsumi Uchida<sup>3</sup>, and Naohiro Hozumi<sup>1</sup> (<sup>1</sup>Toyohashi Univ. Tech., Japan, Central Res. Inst. Electr. Power Industry, Japan)
- F5 [008] Condition Assessment of Main Insulation in Transformer by Dielectric Loss Data Interpolation Method and Database Building  
 Jian Hao<sup>1</sup>, Jin Fu<sup>1</sup>, Zhiqin Ma<sup>2</sup>, Shihai Zhang<sup>1</sup>, and Shan Shen<sup>1</sup> (<sup>1</sup>State Grid Chongqing Electric Power Co., China, <sup>2</sup>Guangdong Electric Power Research Institute, China)

13:30 - 15:30 **PEA Demonstration Session (Room δ)**

**Director: Y. Murakami (Toyohashi Univ. Tech.), Assistant Director: H. Miyake (Tokyo City Univ.)**

- DS1 [163] Space Charge Measurement System Equipped with a Function to Measure Acoustic Properties  
 Yoshinobu Murakami<sup>1</sup>, Takuma Sugiyama<sup>1</sup>, Tomohiro Kawashima<sup>1</sup>, Masumi Fukuma<sup>2</sup>, and  
 Masayuki Nagao<sup>1</sup> (<sup>1</sup>Toyohashi Univ. Tech., Japan, <sup>2</sup>Matsue Nat. Collage of Tech., Japan)
- DS2 [170] Ultra High Resolution PEA  
 Kensuke Kumaoka, Tsuyoshi Kato, Hiroaki Miyake, and Yasuhiro Tanaka (Tokyo City Univ., Japan)
- DS3 [173] Simultaneous Measurement PEA System  
 Tsuyoshi Kato, Ryo Onozawa, Hiroaki Miyake, Yasuhiro Tanaka, and Tatsuo Takada (Tokyo City Univ., Japan)
- DS4 [164] Space Charge Measurement for Full Size Cable by Pulse Electroacoustic Method

Naohiro Hozumi (Toyohashi Univ. Tech., Japan)

- DS5 [169] Portable Mini PEA  
Kohei Horiguchi, Hiroaki Miyake, and Yasuhiro Tanaka (Tokyo City Univ., Japan)
- DS6 [171] Normal PEA  
Kazuki Abe<sup>1</sup>, Takashi Maeno<sup>1</sup>, Hiroaki Miyake<sup>2</sup>, and Yasuhiro Tanaka<sup>2</sup> (<sup>1</sup>Nat. Inst. Information and Communications Tech., Japan, <sup>2</sup>Tokyo City Univ., Japan)
- DS7 [172] Wire cable PEA  
Kazuki Abe<sup>1</sup>, Takashi Maeno<sup>1</sup>, Hiroaki Miyake<sup>2</sup>, and Yasuhiro Tanaka<sup>2</sup> (<sup>1</sup>Nat. Inst. Information and Communications Tech., Japan, <sup>2</sup>Tokyo City Univ., Japan)
- DS8 [174] Space Charge Measurement for Thick Sample in PEA Method  
Masumi Fukuma<sup>1</sup>, Hiroki Tomita<sup>1</sup>, and Takashi Maeno<sup>2</sup> (<sup>1</sup>Matsue Nat. College of Tech., Japan, <sup>2</sup>Nat. Inst. Information and Communications Tech., Japan)

15:45 - 17:10 **Session G: Partial Discharge (Room  $\alpha$ )**

*Chair: T. Czarzejko (Monash Univ.)*

- G1 (SI) [157] Understanding the Partial Discharge Activity in Liquid Nitrogen under Harmonic ac Voltages  
R. Sarathi and Lakshya Mittal (Indian Inst. Tech. Madras, India)
- G2 [003] PD Patterns of Stator Windings by In-factory Experiment on a 10 kV Motor  
Chuanyang Li, Jiancheng Song, Ailiang Kang, Lingyan Lin, and Zhipeng Lei (Taiyuan Univ. Technol., China)
- G3 [090] Applicability of Oscillating Wave Test System for On-site PD Diagnosis of High Voltage Power Capacitors  
T. Kuraishi<sup>1</sup>, S. Miyazaki<sup>1</sup>, T. Takahashi<sup>1</sup>, T. Takahashi<sup>1</sup>, O. Kato<sup>2</sup>, and Y. Hayashi<sup>2</sup> (<sup>1</sup>Central Res. Inst. Electric Power Industry, Japan, <sup>2</sup>Electric Power Development Co., Japan)
- G4 [137] Electrical Tree in the Crosslinked Polyethylene with Bowtie Trees and the Partial Discharge Occurrence Phase Angle Distribution  
Fumitaka Komori<sup>1</sup>, Daiki Asai<sup>2</sup>, Yasuo Suzuoki<sup>2</sup>, and Toru Kawahara<sup>3</sup> (<sup>1</sup>Toba Nat. College of Tech., Japan, <sup>2</sup>Nagoya Univ., Japan, <sup>3</sup>Chubu Electric Power Co., Japan)

15:45 - 17:30 **MVP and Poster Session #1 (Room  $\beta$ )**

**MVP Group 1A Coordinator: M. Kozako (Kyusyu Inst. Tech.)**

- VA1 [056] Structural Change Induced in LaAlO<sub>3</sub> by Ion Implantation  
Masayuki Harima, Yosuke Horii, Takaaki Morimoto, and Yoshimichi Ohki (Waseda Univ., Japan)
- VA2 [004] Partial Discharges in Motor Wires at PWM Voltages of Different Smoothness  
T. J. Å. Hammarström<sup>1</sup>, T. Bengtsson<sup>1,2</sup>, J. Blennow<sup>1</sup>, and S. M. Gubanski<sup>1</sup> (<sup>1</sup>Chalmers Univ. Tech., Sweden, <sup>2</sup>ABB Corporate Res., Sweden)
- VA3 [012] Use of UHF Method to Measure Partial Discharge Signal under Square-wave Pulse  
Xukun Chen, Baojiang Cao, Guangning Wu, Guoqiang Gao, Jianxiang Sun, and Zhen Gu

(Southwest Jiaotong Univ., China)

- VA4 [043] Partial Discharge Characteristics of Direct- Fluorinated Polyimide Films  
Heng Du, B. X. Du, Jie Li, Yong Liu, and Huanhuan Du (Tianjin Univ., China)
- VA5 [062] Effect of Partial Discharges on Thermal Breakdown of Oil Impregnated Paper  
Mohamad Ghaffarian Niasar<sup>1</sup>, Respicius Clemence Kiiza<sup>1</sup>, Nathaniel Taylor<sup>1</sup>, Xiaolei Wang<sup>1</sup>, Hans Edin<sup>1</sup>, and Stefan Tenbohlen<sup>2</sup> (<sup>1</sup>KTH Royal Inst. Tech., Sweden, <sup>2</sup>Univ. Stuttgart, Germany)
- VA6 [073] On the Nature of the Discharges in Samples Fed by Bipolar Pulse like Voltage and Its Possible Impact on the Detection of Partial Discharge in Machines Fed by Inverter  
Thibaut Billard<sup>1,2</sup>, Thierry Lebey<sup>1,2</sup>, Antoine Belinger<sup>1,2</sup>, Nicolas Naudé<sup>1,2</sup>, and Nicolas Gherardi<sup>1,2</sup> (<sup>1</sup>Univ. Toulouse, France, <sup>2</sup>CNRS, France)
- VA7 [079] Partial Discharge Detection and Analysis of Oil-paper Insulation under dc Voltage Based on UHF Method  
Qian Zhang<sup>1</sup>, Hongliang Liu<sup>2</sup>, Zhe li<sup>1</sup>, Zhihao Wang<sup>1</sup>, and Yi Yin<sup>1</sup> (<sup>1</sup>Shanghai Jiaotong Univ., China, <sup>2</sup>Hebei Electric Power Co. Res. Co. Inst., China)

**MVP Group 1B** *Coordinator: M. Fukuma (Matsue Nat. College Tech.)*

- VA8 [061] Crystalline Structures of YAIO<sub>3</sub> Single Crystal at High Temperatures  
Takahiro Inoue, Takaaki Morimoto, Shoji Kaneko, Yosuke Horii, and Yoshimichi Ohki (Waseda Univ., Japan)
- VA9 [085] Partial Discharge Characteristics of Oil Impregnated Insulation System with an Oil Gap under Continuous AC Voltage Application  
Yuu Iwashita, Takashi Kurihara, Toshihiro Takahashi, and Tatsuki Okamoto (Central Res. Inst. Electric Power Industry, Japan)
- VA10 [110] Partial Discharge Analysis in a Metal-dielectric Air Gap on Machine Insulation at Arbitrary Testing Voltage  
Xiaolei Wang, Respicius Clemence Kizza, Nathaniel Taylor, Mohamad Ghaffarian Niasar, and Hans Edin (KTH-Royal Ins. Tech., Sweden)
- VA11 [114] Arcing current Features Extraction Using Wavelet Transform  
J. C. Chen, B. T. Phung, D. Zhang, T. R. Blackburn, and E. Ambikairajah (Univ. New South Walesm Australia)
- VA12 [125] Characteristics of Discharge Generation across Insulation Barrier in the Oil/Pressboard Composite Insulation System  
Shigeyoshi Yoshida<sup>1</sup>, Masahiro Kozako<sup>1</sup>, Masayuki Hikita<sup>1</sup>, Takahiro Umemoto<sup>2</sup>, Soichiro Kainaga<sup>2</sup>, Hiroataka Muto<sup>2</sup>, and Takao Tsurimoto<sup>2</sup> (<sup>1</sup>Kyushu Inst. Tech. Japan, <sup>2</sup>Mitsubishi Electric Co., Japan)
- VA13 [133] UHF Sensor Optimization Used for Detecting Partial Discharge Emitted Electromagnetic Wave in Gas Insulated Switchgear  
Inu Suprianto<sup>1,2</sup>, Umar Khayam<sup>2</sup>, Suwarno<sup>2</sup>, Kiichi Nishigouchi<sup>3</sup>, Mohamad Kamarol<sup>4</sup>,



Masahiro Kozako<sup>3</sup>, and Masayuki Hikita<sup>3</sup> (<sup>1</sup>PT. PLN, Indonesia, <sup>2</sup>Inst. Tek. Bandung, Indonesia, <sup>4</sup>Kyushu Inst. Tech., Japan, <sup>3</sup>Univ. Sains Malaysia, Malaysia)

VA14 [128] Fault Diagnosis Based on Current Signature Analysis for Stator Winding of Doubly Fed Induction Generator in Wind Turbine

Lulu Wang<sup>1</sup>, Yong Zhao<sup>2</sup>, Wei Jia<sup>1</sup>, Bin Han<sup>2</sup>, Yiyang Liu<sup>1</sup>, Toshikatsu Tanaka<sup>3</sup>, Yonghong Cheng<sup>1</sup>, and Yu Chen<sup>1</sup> (<sup>1</sup>Xi'an Jiaotong Univ., China, <sup>2</sup>Xi'an Thermal Power Res. Inst. Co., China, <sup>3</sup>Waseda Univ., Japan)

**MVP Group 1C** *Coordinator: N. Hirai (Waseda Univ.)*

VA15 [139] Optical Properties of Self-assembled Anisotropic Gold Nanoparticles

Ryotaro Ozaki<sup>1</sup>, Nagao Yoshiki<sup>1</sup>, Kazunori Kadowaki<sup>1</sup>, Yutaka Kuwahara<sup>2</sup>, and Seiji Kurihara<sup>2</sup> (<sup>1</sup>Ehime Univ., Japan, <sup>2</sup>Kumamoto Univ., Japan)

VA16 [015] Partial Discharge Behavior of a Newly Developed Enamel Insulation at Various Voltage Rise Times

Anh T. Hoang<sup>1</sup>, Thomas J. Å. Hammarström<sup>1</sup>, Tord Bengtsson<sup>1,2</sup>, Yuriy V. Serdyuk<sup>1</sup>, and Stanislaw M. Gubanski<sup>1</sup> (<sup>1</sup>Chalmers Univ. Tech., Sweden, <sup>2</sup>ABB Co. Res., Sweden)

VA17 [129] Study of Direction Identification of Partial Discharge Using Multi Small Loop Sensors

Atsushi Inatomi<sup>1</sup>, Shohei Makki<sup>1</sup>, Masahiro Kozako<sup>1</sup>, Masayuki Hikita<sup>1</sup>, Tokihiro Umemura<sup>2</sup>, Kazuo Iida<sup>2</sup>, Yusuke Nakamura<sup>3</sup>, Tatsuya Hirose<sup>3</sup>, Teruhiko Maeda<sup>4</sup>, and Masakazu Higashiyama<sup>4</sup> (<sup>1</sup>Kyushu Inst. Tech., Japan, <sup>2</sup>Mie Univ., Japan, <sup>3</sup>Toshiba Co., Japan, <sup>4</sup>Toshiba Industrial Products System Co., Japan)

VA18 [155] Effect of Barrier in the Propagation of Partial Discharge Signals

R. Sarathi<sup>1</sup>, I. P. Merin Sheema<sup>1</sup>, and V. Subramanian<sup>2</sup> (<sup>1,2</sup>Indian Inst. Tech. Madras, India)

VA19 [160] Research on Directional Coupler Measurement in Partial Discharge Monitoring of XLPE Cable

Dai Gong, Jing Sun, and Ziyu Zhao (Shanghai Jiaotong Univ., China)

VA20 [028] Relationship between Residual Charge Signals and ac Breakdown Voltages of Removed 6.6 kV XLPE Cables Using Residual Charge Detection Method with Pulse Voltages

Takashi Kurihara<sup>1</sup>, Tatsuki Okamoto<sup>1</sup>, Kazuhisa Miyajima<sup>2</sup>, Katsumi Uchida<sup>2</sup>, Myong Hwan Kim<sup>3</sup>, and Naohiro Hozumi<sup>3</sup> (<sup>1</sup>Central Res. Inst. Electric Power Industry, Japan, <sup>2</sup>Chubu Electric Power Co., Japan, <sup>3</sup>Toyohashi Univ. Tech., Japan)

**MVP Group 1D** *Coordinator: K. Kato (Niigata Univ.)*

VA21 [059] Effect of Component of Liquid Sample on Sterilization of *E. coli* by High Electric Field Pulse

Yuichi Murakami, Yuji Muramoto, and Noriyuki Shimizu (Meijo Univ., Japan)

VA22 [035] Experimental Study of the Influence of BTA and Irgamet39 on the Mineral Insulation Oil under Thermal Aging

Shuangzan Ren<sup>1</sup>, Lu Pu<sup>1</sup>, Guoqiang Huang<sup>1</sup>, Yang Liu<sup>1</sup>, Lisheng Zhong<sup>2</sup>, Qinxue Yu<sup>2</sup>, and Xiaolong Cao<sup>2</sup> (<sup>1</sup>Shaanxi Electric Power Res. Inst., China, <sup>2</sup>Xi'an Jiaotong Univ., China)

VA23 [136] Effects of Motorette Structure and Vanish Treatment on Repetitive Partial Discharge Inception Voltage Measurement Test in Inverter Surge Insulation

Hirotaoka Nakaya<sup>1</sup>, Naoto Yanaze<sup>1</sup>, Masahiro Kozako<sup>1</sup>, Masayuki Hikita<sup>1</sup>, Takahisa Ueno<sup>2</sup>, Tetsuo Yoshimitsu<sup>3</sup>, Kazuhisa Nakayama<sup>3</sup>, Takayuki Sakurai<sup>3</sup>, Tatsuya Hirose<sup>4</sup>, and Satoshi Hiroshima<sup>4</sup> (<sup>1</sup>Kyushu Inst. Tech., Japan, <sup>2</sup>Oita Nat. College Tech., Japan, <sup>3</sup>Toshiba Mitsubishi Electric Industrial Systems, Japan, <sup>4</sup>Toshiba Co., Japan)

- VA24 [146] Influence of Prestressing on the Breakdown of Insulating Paper-Liquid Nitrogen Composite System  
Tomohiro Kawashima<sup>1</sup>, Yoshinobu Murakami<sup>1</sup>, Masayuki Nagao<sup>1</sup>, Yoshihiro Inagaki<sup>2</sup>, Yuichi Ashibe<sup>2</sup>, and Takato Masuda<sup>2</sup> (<sup>1</sup>Toyohashi Univ. Tech., Japan, <sup>2</sup>Sumitomo Electric Industries, Japan)
- VA25 [039] Dielectric Breakdown Characteristics of HTV Silicone Rubber under Multiple Stress Conditions  
G. Haddad<sup>1</sup>, K. L. Wong<sup>1</sup>, and R. K. Gupta<sup>2</sup>, (<sup>1,2</sup>RMIT Univ., Australia)
- VA26 [040] Evaluation of the Hydrophobic Property of Composite Insulators Using Dynamic Drop Test  
G. Haddad<sup>1</sup>, K. L. Wong<sup>1</sup>, and P. Petersen<sup>2</sup> (<sup>1,2</sup>RMIT Univ., Australia)
- VA27 [060] Simultaneous Detection of Ammonia and Water Vapors Using Surface Plasmon Resonance Waveguide Sensor  
Ryo Komai<sup>1</sup>, Hiroki Honda<sup>1</sup>, Akira Baba<sup>1,2</sup>, Kazunari Shinbo<sup>1,2</sup>, Keizo Kato<sup>1,2</sup>, Futao Kaneko<sup>1,2</sup> (<sup>1,2</sup>Niigata Univ., Japan)

#### **Poster Presentations**

- PA1 [044] Effect of Surface Fluorination on Space Charge Behavior in Multilayered Polyimide Films  
Ang Li, B. X. Du, Heng Du, Yong Liu, Yu Gao, and Huanhuan Du (Tianjin Univ., China)
- PA2 [046] Effects of Thermally Conducting Particles on Resistance to Tracking Failure of Polyimide/BN Composites  
Meng Xiao, B. X. Du, Xiaolong Li, Yong Liu, Yu Gao, and Huanhuan Du (Tianjin Univ., China)
- PA3 [063] Electrical Properties of Composite Material Containing Microvaristor and Semi-conductive Whisker  
Hidehito Matsuzaki<sup>1</sup>, Toshiyuki Nakano<sup>1</sup>, Hideyasu Ando<sup>2</sup>, and Masafumi Takei<sup>2</sup> (<sup>1,2</sup>Toshiba Co., Japan)
- PA4 [162] Effects of Nanosilica and Nanotitania on Partial Discharge Characteristics of Natural Rubber-LLDPE Blends as High Voltage Insulation Material  
Yanuar Z. Arief<sup>1</sup>, Wan Akmal Izzati<sup>1</sup>, Aulia<sup>1</sup>, Zuraimy Adzis<sup>1</sup>, Nor Asiah Muhamad<sup>1</sup>, Mohd Nazren Mohd Ghazali<sup>1</sup>, Mohd Ridhuan Mohd Sharip<sup>1</sup>, and M. Z. H. Makmud<sup>2</sup> (Univ. Teknologi Malaysia, Malaysia, <sup>2</sup>Univ. Malaysia, Malaysia)
- PA5 [001] Evaluation of Insulation of H.V. Bushing - Online Monitoring  $\text{tg}\delta$  of a 500 kV Bushing  
Yi Li<sup>1</sup>, Mingjun Cheng<sup>1</sup>, Huaping Xu<sup>1</sup>, Shengjie Huang<sup>2</sup>, and Herschel J. West<sup>2</sup> (<sup>1</sup>China Southern Power Grid Co., China, <sup>2</sup>Wuhan Rigid Electronic Technology Co., China)
- PA6 [142] Effect of Electrical Stress Produced by Repetitive Pulsed Power on Germination of Naked Barley Seed between Point-Plane Electrodes  
Kazunori Kadowaki<sup>1</sup>, Teruki Abe<sup>1</sup>, Ryotaro Ozaki<sup>1</sup>, Izumi Tsujita<sup>2</sup>, and Nobuyuki Kurisaka<sup>2</sup> (<sup>1</sup>Ehime Univ., Japan, <sup>2</sup>Ehime Res. Inst. Agriculture Forestry and Fishes, Japan)
- PA7 [075] OLED Ageing Signature Characterization under Combined Thermal and Electrical Stresses

- Pascal Dupuis, Alaa Alchaddoud, Laurent Canale, and Georges Zissis (Univ. Toulouse, France)
- PA8 [068] Partial Discharge Measurement for Medium Voltage Cables Using Different Voltage Wave Forms  
El-Sayed M. El-Refaie, Mohi El-Din Beshir, Mohamed Kamal Abd El-Rahman, and Ramy Saad Abd El-Atey (Helwan Univ. Egypt)
- PA9 [141] Vibration and Development of Pearl-chain-type Tree in Silicone Gel under ac Voltage  
Masaharu FUJII, Ryosuke UEDA, Hyeon-Gu Jeon, and Haruo IHORI (Ehime Univ., Japan)
- PA10 [144] Orientation Effect of Nano-Alumina Coated Conductive Fillers on Dielectric Properties of Epoxy Composites  
Kosuke Ushijima, Masahiro Kozako, and Masayuki Hikita (Kyushu Inst. Tech., Japan)
- PA11 [121] Molecular Dynamics Simulation for Epoxy-based Nanocomposites  
Fumio Sawa and Takahiro Imai (Toshiba Co., Japan)
- PA12 [112] Partial Discharge Characteristics and Dissolved Gas Analysis of Vegetable Oil Influence of Cavities on the Dielectric Properties of Ethylene Propylene Rubber Insulation  
Umar Khayam<sup>1</sup>, Achmad Susilo<sup>2</sup>, Joko Muslim<sup>2</sup>, Yanuar Z Arief<sup>3</sup>, Suwarno<sup>1</sup>, Motoo Tsuuchie<sup>4</sup>, Masayuki Hikita<sup>4</sup>, (<sup>1</sup>Inst. Teknologi Bandung, Indonesia, <sup>2</sup>PT PLN, Indonesia, <sup>3</sup>Univ. Tek. Malaysia, Malaysia, <sup>4</sup>Kyushu Inst. Tech., Japan)

### ***Wed. Jun. 4***

9:00 – 11:30

***Session H: Several Properties of Dielectric Materials #1 (Room α)***

***Chair: Yi Yin (Shanghai Jiaotong Univ.)***

(10:20 - 10:30: short break)

- H1 [126] Development of 250 kV HVDC XLPE Cable System in Korea  
Soo-Bong Lee, Tae-Ho Lee, Eui-Hwan Jung, Yoon-Hyoung Kim, Hee-Chan Park, Sung-Yun Kim, Su-Kil Lee, Jin-Ho Nam, Seung-Ik Jeon, and Wan-Ki Park (LS Cable & System, Korea)
- H2 [093] Terahertz Spectroscopic Analysis of Ethylene-Propylene-Diene Copolymer  
Marina Komatsu<sup>1</sup>, Tomoyuki Izutsu<sup>1</sup>, Yoshimichi Ohki<sup>1</sup>, Maya Mizuno<sup>2</sup>, Kaori Fukunaga<sup>2</sup>, Yoshiaki Nakamura<sup>3</sup>, Naofumi Chiwata<sup>3</sup> (<sup>1</sup>Waseda Univ., Japan, <sup>2</sup>Nat. Inst. Information and Communications Tech., Japan, <sup>3</sup>Hitachi Metals, Japan)
- H3 [140] Evaluation of Space Charge in Liquid Dielectric Using Kerr Electrooptic Method  
Haruo Ihori<sup>1</sup>, Mitsuru Oka<sup>1</sup>, Yuji Nagaoka<sup>1</sup>, and Masaharu Fujii<sup>1</sup> (Ehime Univ., Japan)
- H4 [154] The Influence of Thermal Aging on ac Dielectric Strength of Transparent Silicone Rubbers for HV Insulation  
Chaiyaporn Lothongkam<sup>1</sup>, Daniel Siebler<sup>1</sup>, Gerd Heidmann<sup>2</sup>, Ronald Plath<sup>3</sup>, and Ernst Gockenbach<sup>4</sup> (<sup>1</sup>BAM Federal Inst. Materials Res. Testing, Germany, <sup>2</sup>IPH GmbH, Italy, <sup>3</sup>Tech. Univ. Berlin, Germany, <sup>4</sup>Leibniz Univ. Hannover, Germany)
- H5 [083] Total Dose Response of Al<sub>2</sub>O<sub>3</sub>-based MOS Structure under Gamma-ray Irradiation  
Yonghong Cheng, Xin Liu, Man Ding, and Xiaolong Li (Xi'an Jiaotong Univ., China)
- H6 [104] Remaining Antioxidant and Thermal-radiation Degradation in Ethylene-propylene-diene Rubber

H. Misaka, N. Fuse, T. Kurihara, M. Kanegami, H. Homma, and T. Okamoto (Central Res. Inst. Electric Power Industry, Japan)

H7 [005] Reversed Sequential Test Conditions to Produce Damage Equivalent to the Simultaneous Exposure of Polymeric Materials to Heat and Radiation –Construction of a Computational Program and Numerical Approach–

Norikazu Fuse, Hiroya Homma, and Tatsuki Okamoto (Central Res. Inst. Electric Power Industry, Japan)

9:30 - 11:15 ***MVP and Poster Session #2 (Room β)***

***MVP Group 2A Coordinator: Y. Murakami (Toyohashi Univ. Tech.)***

VB1 [027] Modelling the Effect of Amplifier Response in Pulsed Electroacoustic System

J. S. Chahal, C. C. Reddy, A. P. S. Tiwana, and A. Gupta (Indian Inst. Tech. Ropar, India)

VB2 [057] Simulation Study on the Effect of Interface Charge between Oil and Paper

Kai Wu, Qingdong Zhu, Yang Tu, and Jie Dai (Xi'an Jiaotong Univ., China)

VB3 [065] Characteristics of Space Charge Behavior and Conduction Current in XLPE and Annealed Polyethylene under High DC Stress

Tsuyoshi Kato, Ryo Onozawa, Hiroaki Miyake, Yasuhiro Tanaka, and Tatsuo Takada (Tokyo City Univ., Japan)

VB4 [029] Comparison of Dielectric Properties among Polydicyclopentadiene Resin, Epoxy Resin and Their Composites with Microsized SiO<sub>2</sub> Fillers

Yuki Masuzaki<sup>1</sup>, Yoshimichi Ohki<sup>1</sup>, and Masahiro Kozako<sup>2</sup> (<sup>1</sup>Waseda Univ., Japan, <sup>2</sup>Kyushu Inst. Tech., Japan)

VB5 [132] Dielectric Properties of Olefin-based Thermosetting Resin for Application to Electrical Insulating Material

Keisuke Yoshida<sup>1</sup>, Masahiro Kozako<sup>1</sup>, Shinji Ishibe<sup>1</sup>, Masayuki Hikita<sup>1</sup>, and Nobuhito Kamei<sup>2</sup>, (<sup>1</sup>Kyushu Inst. Tech., Japan, <sup>2</sup>RIMTEC Co., Japan)

VB6 [159] The Relationship between Charge Decay Process and Current Density Differential on Polyimide and Fluoride Films Irradiated by Electron

Kohei Horiguchi<sup>1</sup>, Yutaka Kikuchi<sup>1</sup>, Virginie Griseri<sup>2</sup>, Hiroaki Miyake<sup>1</sup>, Yasuhiro Tanaka<sup>1</sup>, Laurent Berquez<sup>2</sup>, and Christian Laurent<sup>2</sup> (<sup>1</sup>Tokyo City Univ., Japan, <sup>2</sup>Univ. Toulouse, France)

***MVP Group 2B Coordinator: N. Hozumi (Toyohashi Univ. Tech.)***

VB7 [016] Influence of Paper Ageing on Space Charge Dynamics in Oil Impregnated Insulation Paper under dc Electric Field

Jin Fu<sup>1</sup>, Jian Hao<sup>1</sup>, Haibin Liu<sup>2</sup>, Ke Li<sup>1</sup>, Huailiang Cui<sup>1</sup>, Wei Zhang<sup>1</sup> (<sup>1</sup>State Grid Chongqing Electric Power Co., China, <sup>2</sup>Univ. Chongqing, China)

VB8 [066] Development of Space Charge Measurement System with High Positional Resolution Using Pulsed Electro Acoustic Method

Kensuke Kumaoka<sup>1</sup>, Tsuyoshi Kato<sup>1</sup>, Hiroaki Miyake<sup>1</sup>, and Yasuhiro Tanaka<sup>1</sup> (Tokyo City Univ.

Japan)

- VB9 [087] Excess Electron States and Mobility in Polyethylene  
Yang Wang<sup>1</sup>, Kai Wu<sup>1</sup>, and David Cubero<sup>1,2</sup> (<sup>1</sup>Xi'an Jiaotong Univ., China, <sup>2</sup>Univ. Sevilla, Spain)
- VB10 [097] Development of a Space Charge Measurement Method without a Semiconducting Electrode  
T. Sugiyama<sup>1</sup>, M. UQBAH<sup>1</sup>, A. Ishikawa<sup>1</sup>, T. Kawashima<sup>1</sup>, Y. Murakami<sup>1</sup>, M. Fukuma<sup>2</sup>, and M. Nagao<sup>1</sup> (<sup>1</sup>Toyohashi Univ. Tech., Japan, <sup>2</sup>Matsue Nat. College Tech., Japan)
- VB11 [033] Analysis on Thermally Stimulated Currents in Polyethylene-terephthalate and Polyethylenenaphthalate  
Peng Yang<sup>1</sup>, Yoshimichi Ohki<sup>1</sup>, and Fuqiang Tian<sup>2</sup>, (<sup>1</sup>Waseda Univ., Japan, <sup>2</sup>Beijing Jiaotong Univ., China)
- VB12 [102] The Influence of Degassing on Morphology and Properties of High Voltage Cross-Linked Polyethylene Cable Insulation  
Huan Li, and Jianying Li (Xi'an Jiaotong Univ., China)

**MVP Group 2C Coordinator: M. Kozako (Kyusyu Institute of Technology)**

- VB13 [078] Space Charge Behavior in Covering Insulating Material for Motor Windings under Applied Voltage of Square Wave  
Kaoru Takizawa, Tomoki Suetsugu, Hiroaki Miyake, and Yasuhiro Tanaka (Tokyo City Univ., Japan)
- VB14 [111] Space Charge Distribution Measurement in Insulating Material of Enameled Wire  
Kazuki Abe<sup>1</sup>, Arata Naoumi<sup>1</sup>, Hiroaki Miyake<sup>1</sup>, Yasuhiro Tanaka<sup>1</sup>, and Takashi Maeno<sup>2</sup> (<sup>1</sup>Tokyo City Univ., Japan, <sup>2</sup>Nat. Inst. Information and Communications Tech., Japan)
- VB15 [149] Prebreakdown Investigations of Vacuum Discharge between Nano Gaps  
Guodong Meng, Yonghong Cheng, Chengye Dong, and Kai Wu (Xi'an Jiaotong Univ., China)
- VB16 [074] LDPE Composite Materials Obtained from Building Blocks Containing Standardized Graphene Interfaces  
P. Mancinelli<sup>1</sup>, V. Santangelo<sup>1</sup>, D. Fabiani<sup>1</sup>, A. Saccani<sup>2</sup>, M. Toselli<sup>2</sup>, and M. F. Fréchette<sup>3</sup> (<sup>1,2</sup>Univ. Bologna, Italy, <sup>3</sup>Inst. Rec. d'Hydro Québec, Canada)
- VB17 [134] Evaluation of Partial Discharge Inception Voltage of Bonding-less Gas Insulation Packaging for High Temperature and High Voltage Power Module  
Keisuke Koyanagi<sup>1</sup>, Akinari Yamane<sup>1</sup>, Akihiro Imakiire<sup>1</sup>, Masahiro Kozako<sup>1</sup>, Masayuki Hikita<sup>1</sup>, Sorin Dinculescu<sup>2</sup>, Zarel Valdez-Nava<sup>2</sup>, and Thierry Lebey<sup>2</sup> (<sup>1</sup>Kyushu Inst. Tech., Japan, <sup>2</sup>Univ. Paul Sabatier, France)

**MVP Group 2D Coordinator: H. Miyake (Tokyo City Univ.)**

- VB18 [070] Effect of Nano-filler Grain Size on Space Charge Behavior in LDPE/MgO Nanocomposite  
Qionxia Zhong, Li Lan, Jiandong Wu, Qiaohua Wang, and Yi Yin (Shanghai Jiaotong Univ., China)

- VB19 [080] Space Charge Behavior in Multilayered Polyimide Films under dc High Stress near Breakdown Strength  
Keigo Matsubara, Shohei Kawano, Hiroaki Miyake, and Yasuhiro Tanaka (Tokyo City Univ., Japan)
- VB20 [025] Influence of Cavities on the Dielectric Properties of Ethylene Propylene Rubber Insulation  
Zhipeng Lei, Jiancheng Song, Muqin Tian, Pulong Geng, Chuanyang Li, Xiaohui Cui, and Chunyu Xu (Taiyuan Univ. Tech., China)
- VB21 [105] Study on Electrical Properties of Micro-nano Structured Epoxy Composites  
Jielin Guo<sup>1</sup>, Yu Chen<sup>1</sup>, Zirui Jia<sup>1</sup>, Toshikatsu Tanaka<sup>2</sup>, Jielong Wu<sup>3</sup>, and Yonghong Cheng<sup>1</sup>  
(<sup>1</sup>Xi'an Jiaotong Univ., China, <sup>2</sup>Waseda Univ., Japan, <sup>3</sup>Shanxi Electric Power Co., China)
- VB22 [107] Space Charge Formations and Electrical Conductivities Characteristics of Nano Composite XLPE  
J. H. Nam<sup>1</sup>, H. J. Jung<sup>1</sup>, Y. S. Yang<sup>1</sup>, T. H. Lee<sup>1</sup>, W. K. Park<sup>1</sup>, J. T. Kim<sup>2</sup>, and J. H. Lee<sup>3</sup> (LS Cable & System, Korea, <sup>2</sup>Daejin Univ., Korea, <sup>3</sup>Hoseo Univ., Korea)
- VB23 [143] Toluene Decomposition in Humid Gas by Using Surface Discharges on Dielectric Subjected to Repetitive Voltage Pulses with Polarity Reversal  
Kazunori Kadowaki, Yuji Mori, and Ryotaro Ozaki (Ehime Univ., Japan)

#### ***Poster Presentations***

- PB1 [091] Diagnosis of Degradation Condition of Materials Using Hydrophobic and Dielectric Analysis  
Tetsuro Tokoro<sup>1</sup>, Hiroyuki Iwase<sup>1</sup>, and Masayuki Nagao<sup>2</sup> (<sup>1</sup>Gifu Nat. College of Tech., Japan, <sup>2</sup>Toyohashi Univ. Tech., Japan)
- PB2 [014] Molecular Dynamics Simulation on the Impact of Electric Field on the Yield Behavior of Insulation Paper  
Peng Fan, Youyuan Wang, Miao Tian, and Junfeng Wu (Chongqing Univ., China)
- PB3 [138] Polarity-Reversed Voltage Pulse Propagation Analysis for Power Cable Insulation Diagnosis  
Ryotaro Ozaki, Shohei Masaki, Yuma Saiki, Fumiya Nakato, and Kazunori Kadowaki (Ehime Univ., Japan)
- PB4 [052] Doping Effect of SiO<sub>2</sub>/CeO<sub>2</sub> on the Dielectric, Ferroelectric and Piezoelectric Properties of (Ba<sub>0.7</sub>Ca<sub>0.3</sub>)(Zr<sub>0.2</sub>Ti<sub>0.8</sub>)O<sub>3</sub> Ceramics  
Wenfeng Liu, Daqi Zhao, and Shengtao Li (Xi'an Jiaotong Univ., China)
- PB5 [045] Electrical Performance of Silicone Rubber/SiO<sub>2</sub> Nanocomposites under Low Temperature  
Jingang Su, B. X. Du, Tao Han, and Huanhuan Du (Tianjin Univ., China)
- PB6 [047] Effects of Adding Rate on dc Tracking Failure of Epoxy/MgO Nano-composites under Contaminated Conditions  
Yaguang Guo, Boxue Du, Meng Xiao, Yong Liu, Gao Yu, and Huanhuan Du (Tianjin Univ., China)
- PB7 [048] Surface Charge Decay of Direct-fluorinated RTV Silicone Rubber/SiO<sub>2</sub> Nanocomposites  
Zhonglei Li, B. X. Du, Hang Xu, Huan Huan Du, and Yu Gao (Tianjin University, China)
- PB8 [109] Colossal Dielectric Permittivity Materials: Myths and Reality

Chaf CHEBALLAH<sup>1</sup>, Lionel LAUDEBAT<sup>1</sup>, Thierry LEBEY<sup>1</sup>, (<sup>1</sup>LAPLACE, France,  
<sup>2</sup>CNRS-UPS-INP, France)

11:45 - 17:00 **Technical Tour (Lunch included) Application is required.**

**Guide: K. Kato, K. Shinbo, A. Baba (Niigata University)**

*Note: Meeting place will be announced during the symposium. Japanese style lunchbox is included.*

18:00 - 20:00 **Symposium Banquet (at Toki Ball Room, 4<sup>th</sup> Floor of Hotel Nikko Niigata)**

### **Thu. Jun. 5**

9:00 - 11:30 **Session I: Several Properties of Dielectric Materials #2 (Room  $\alpha$ )**

**Chair: June-Ho Lee (Hoseo Univ.)**

(10:00 - 10:10: short break)

- I1 [013] Impact of Electric Field on the Moisture Diffusion Properties of Insulation Paper: A Molecular Dynamics Simulation Study  
Miao Tian, Youyuan Wang, and Peng Fan (Chongqing Univ., China)
- I2 [053] Residual Voltage Endurance of Generator Insulation Systems  
Christof Sumereder and Mario Dolcic (Graz Univ. Tech., Austria)
- I3 [096] Influence of Electron Beam Irradiation on Electrical Insulating Properties of Polylactic Acid Added with Soft Resin  
Katsuyoshi Shinyama and Shigetaka Fujita (Hachinohe Inst. Tech., Japan)
- I4 [022] A Comparative Study on the Effect of Acids on the Hydrophobicity of HTV and LSR Polymeric Insulators  
M. R. Abdelmohaymen<sup>1</sup>, Bahaa A. Arafa<sup>1</sup>, El-Sayed M. El-Refaie<sup>2</sup>, and S. E. Kamal<sup>3</sup> (<sup>1</sup>Extra High Voltage Res. Center, Egypt, <sup>2</sup>Helwan Univ., Egypt, <sup>3</sup>Al-Azhar Univ., Egypt)
- I5 [018] Assessment of 300 MW Turbine Generator Stator insulation  
Lijun Wang, Yizhong Zhang, Wenjing Jin, Jingzhe Shi, Song Zhou, Qiang Li, and Song Liu (Shanghai Electric Power Equipment, China)
- I6 [153] Dielectric Strength Behavior and Mechanical Properties of Transparent Silicone Rubbers for HV Cable Accessories  
Chaiyaporn Lothongkam<sup>1</sup>, Philipp Rohwetter<sup>1</sup>, Wolfgang Habel<sup>1</sup>, and Ernst Gockenbach<sup>2</sup> (<sup>1</sup>BAM Federal Inst. Materials Res. Testing, Germany, <sup>2</sup>Leibniz Univ. Hanover, Germany)
- I7 [176] A Study on the Measurement of Electrical Conductivity of PPLP in LN<sub>2</sub> for a Stop Joint Box of dc HTS Power Cable [*Japan-Korea Young Researcher Exchange Program*]  
Jae-Sang Hwang<sup>1</sup>, Hee-Suk Ryoo<sup>1</sup>, Jung-Ho Kim<sup>1</sup>, Jeon-Wook Cho<sup>2</sup>, and Bang-Wook Lee<sup>1</sup> (<sup>1</sup>Hanyang University, Korea, <sup>2</sup>Korea Electrotechnology Res. Inst., Korea)

9:00 - 11:00

*Session J: Organic Materials (Room  $\gamma$ )*

*Chair: K. Shinbo (Niigata Univ.)*

(10:00 - 10:10: short break)

- J1 [094] Roles of Pore Structure and Type of Electrolyte on the Capacitive Performance of Activated Carbons Used in Electrical Double-layer Capacitors  
Seiji Kumagai<sup>1</sup>, Koji Mukaiyachi<sup>1</sup>, Masashi Sato<sup>1</sup>, Nobuhito Kamikuri<sup>2</sup>, and Daisuke Tashima<sup>2</sup>  
(<sup>1</sup>Akita Univ., Japan, <sup>2</sup>Univ. Miyazaki, Japan)
- J2 [006] Ionic Carriers in Organic Electronics –Lean of the Ion–  
Mitsuyoshi Onoda (Univ. Hyogo, Japan)
- J3 [089] Electrical Conduction of Parylene Composite Thin Films  
Tatsuo Mori (Aichi Inst. Tech., Japan)
- J4 [131] Visualization of Spatially Distributed Bioactive Molecules Using Enzyme-Linked Photo Assay  
Naohiro Hozumi (Toyohashi Univ. Tech., Japan)
- J5 [108] Enhanced Photocurrent Properties of Solid-State Dye-Sensitized Solar Cells by Grating Coupled-surface Plasmon Resonance  
Kazuma Hara, Ninsonti Hathaithip, Akira Baba, Kazunari Shinbo, Keizo Kato, and Futao Kaneko (Niigata Univ., Japan)

11:10 - 11:20

*Closing Remarks*



- S1 [030] Introduction of Characteristics of Olefin-based Thermosetting Resin for Application to Electrical Insulating Material  
Nobuhito Kamei and Naoki Nishioka (Rimtec Co., Japan)
- S2 [158] Advanced Nano-silica Dispersion for Epoxy Insulation  
Masashi Abe, Takashi Sonoda, Naohiko Suemura, Yoshinari Koyama, and Kenji Tanimoto (Nissan Chemical Industries, Japan)
- S3 [038] Study on Improvement of Reliability of Transformer Using Nanocomposite Insulation Materials  
Yusuke Nakamura<sup>1</sup>, Ken-ichi Yamazaki<sup>1</sup>, Takahiro Imai<sup>1</sup>, Tamon Ozaki<sup>1</sup>, Miwa Takeuchi<sup>1</sup>, and Teruhiko Maeda<sup>2</sup> (<sup>1</sup>Toshiba Co., Japan, <sup>2</sup>Toshiba Industrial Products And Systems Co., Japan)
- S4 [175] Partial Discharge Mechanism under Impulse Voltage Application in Oil-Immersed Power Transformer  
Takahiro Umemoto (Mitsubishi Electric Co., Japan)
- S5 [168] Research on Diagnosis of Abnormality of Power-Transformer Winding by Frequency Response Analysis in CRIEPI  
Satoru Miyazaki (Central Res. Inst. Electric Power Industry, Japan)
- S6 [165] Failure Analysis and Maintenance for Stator Winding of Rotating Machine  
Hideharu Noda (Kuwahara Electric Co., Japan)
- S7 [113] Consideration of Apparatus for New IEC Technical Specifications of Inverter-fed Motor Insulation  
Satoshi Hiroshima<sup>1</sup>, Tatsuya Hirose<sup>1</sup>, Tetsushi Okamoto<sup>1</sup>, Tetsuo Yoshimitsu<sup>2</sup>, Sho Fukumoto<sup>2</sup>, Takayuki Sakurai<sup>2</sup>, and Tomomi Ikegami<sup>2</sup> (<sup>1</sup>Toshiba Co., Japan, <sup>2</sup>Toshiba Mitsubishi-Electric Industrial Systems Co., Japan)
- S8 [101] Development of Thermal Conductivity Enamel Wire  
Katsuhiko Fukuda, Toshimi Koga, and Takatoshi Watanabe (Totoku Toryo Co. Ltd., Japan)
- S9 [127] Development of Partial-discharge Detection Method for Switchgear  
Hitoshi Shibano (Nissin Electric, Japan)
- S10 [152] Evaluating Strength of Adhesive Interfaces between Ceramics and Resin in Resin-Molded Structures  
Miki Yamazaki and Tomio Iwasaki (Hitachi Ltd., Japan)
- S11 [161] Development of IPM for Inverter Air Conditioning Using AL Insulation Board  
Tatsuya Ganbe, Kenji Okamoto, Tadanori Yamada, and Hiroyuki Oota (Fuji Electric Co., Japan)
- S12 [036] Space Charge Measurements of Full Size HVDC XLPE Cable  
Hiroki Mori and Yukihiko Yagi (Viscas Co., Japan)
- S13 [092] Introduction of Insulators, Hollow Insulators and External Gapped Line Arresters  
Takanori Kondo and Ryo Inoue (NGK Insulators Ltd., Japan)

***Digest Reports from Investing R&D Committees (No Presentations)***

- DR1 Digest Report of Investigating R&D Committee on Current State and Future View of Innovative Diagnostic Techniques of Power Apparatus  
Chair: M. Ikeda (Nuclear Regulation Authority, Japan)
- DR2 Digest Report of the Investigation Committee on Degradation Diagnosis Technology of Electric Power Apparatus for Its Transfer  
Chair: Y. Ehara (Tokyo City Univ., Japan)
- DR3 Digest Report of Investigating R&D Committee on Testing Methods of Winding Insulation Systems for Inverter-fed Motors  
Chair: M. Nagata (Univ. Hyogo, Japan)
- DR4 Digest Report of Investigating R&D Committee on Nanomaterials and Structure Control for Organic Devices with New Function and High Performance  
Chair: K. Kato (Niigata Univ., Japan)
- DR5 Digest Report of Investigating Committee on Application to the Next-Generation Electronics of Organic Dielectrics, Conductive Electrical and Electronic Materials in Asian Countries  
Chair: M. Iwamoto (Tokyo Inst. Tech., Japan)