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
IEEE DEIS Japan Chapter

Supported by
Niigata Prefecture
Niigata Visitors & Convention Bureau

Final Program
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Vice Chair in Charge of Local Arrangement: K. Kato (Niigata Univ.)
Vice Chair in Charge of Publication: N. Fuse (Central Res. Inst. Electric Power Industry)
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Secretariat: N. Fuse (Central Res. Inst. Electric Power Industry), N. Hirai (Waseda Univ.)

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T. Tanaka (Japan), Y. Ohki (Japan), M. Nagao (Japan), M. Hikita, (Japan), T. Okamoto (Japan), N. Hozumi (Japan), F. Kaneko (Japan)

LOCAL ARRANGEMENT COMMITTEE

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 lean 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.

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

a) Members of IEEJ, IEEE, CIGRE, CES, or KIEEME.

b) 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.

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.

**Technical Tour (Bus tour from the conference venue, at 11:45 a.m. of Jun. 4th)**

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. 3rd: preparation
- 15:45 – 17:30, Jun. 3rd: presentation
- 17:30 – 17:50, Jun. 3rd: removing

Schedule for #2 Session:
- 8:30 – 9:30, Jun. 4th: preparation
- 9:30 – 11:15, Jun. 4th: presentation

All the presentation materials remained at 8:30 a.m., Thursday, Jun. 5th 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. 3rd: preparation
15:45 – 17:30, Jun. 3rd: presentation
17:30 – 17:50, Jun. 3rd: removing

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

All the presentation materials remained at 9:00 a.m., Thursday, Jun. 5th 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.
<table>
<thead>
<tr>
<th>Date</th>
<th>Room α</th>
<th>Room β</th>
<th>Room γ</th>
<th>Room δ</th>
<th>WS room (303)</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jun. 1st</td>
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<td><em>Registration</em> at Atrium, 2nd floor of Toki Messe 13:00-17:30</td>
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<td><em>Welcome Party</em>, at 30th Floor of Hotel Nikko Niigata, 18:00-20:00</td>
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<tr>
<td>Jun. 2nd</td>
<td><em>Opening Address</em></td>
<td><em>Inuishi Lecture</em></td>
<td><em>Nano-composite #1</em></td>
<td><em>Inverter and Partial Discharges</em></td>
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<td><em>Registration</em> in front of Room α 8:00-17:00</td>
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<td></td>
<td>9:00-10:20</td>
<td>13:00-15:05</td>
<td>13:00-14:50</td>
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<td>Jun. 3rd</td>
<td><em>Space Charge</em></td>
<td><em>Space Charge</em></td>
<td><em>Outdoor Insulation and Diagnosis #2</em></td>
<td><em>PEA Tutorial</em></td>
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<td><em>Registration</em> in front of Room α 8:00-17:00</td>
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<td>9:00-10:50</td>
<td>11:00-12:30</td>
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<td>Jun. 4th</td>
<td><em>Partial Discharge</em></td>
<td><em>MVP, Poster, &amp; SS #1</em></td>
<td><em>MVP, Poster, &amp; SS #2</em></td>
<td><em>PEA Demo</em></td>
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<td><em>Registration</em> in front of Room α 8:00-12:00</td>
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<td>15:45-17:10</td>
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<tr>
<td>Jun. 5th</td>
<td><em>Several Properties #2</em></td>
<td><em>Organic Mater.</em></td>
<td><em>Closing Remarks</em></td>
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<td><em>Registration</em> in front of Room α 8:00-9:30</td>
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<td>9:00-11:30</td>
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Cells colored in pink: special application is required in addition to normal registration set.
# Scientific Program

## Sun. Jun. 1

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>14:00 – 17:00</td>
<td><strong>Workshop APIANS (Workshop room, 3rd floor). Application is required.</strong>&lt;br&gt;Chair: T. Tanaka (Waseda Univ)</td>
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<td>(15:40 - 16:00 Short Break)</td>
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<tr>
<td>14:00 - 14:10</td>
<td>Chairman's Introduction&lt;br&gt;Toshikatsu Tanaka (Waseda Univ., Japan)</td>
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<tr>
<td>14:10 - 14:40</td>
<td>The Application of Computational Methods to the Design of Dielectric Materials and Systems&lt;br&gt;Steven A. Boggs (Univ. Connecticut, USA)</td>
</tr>
<tr>
<td>14:40 - 15:10</td>
<td>First Principle Simulations of Electronic Structure of Polymer Dielectrics&lt;br&gt;Mikael Unge (ABB, Sweden)</td>
</tr>
<tr>
<td>15:10 - 15:40</td>
<td>Determination of Charge-Trapping Sites in Saturated and Aromatic Polymers by Quantum Chemical Calculation&lt;br&gt;Tatsuo Takada (Tokyo City Univ., Japan)</td>
</tr>
<tr>
<td>16:00 - 16:30</td>
<td>Modeling Charge Transport and Storage in Polymeric Insulating Materials: Numerical Analysis, Optimization and Validation&lt;br&gt;Severine Le Roy (Univ. Toulouse, France)</td>
</tr>
<tr>
<td>16:30 - 17:00</td>
<td>Numerical Simulation Methods to Model Electron Trapping and Transport in Polyethylene at the Molecular Level&lt;br&gt;David Cubero (Univ. Sevilla, Spain)</td>
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<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>13:00 – 17:30</td>
<td><strong>Registration (at Atrium, 2nd floor of Toki Messe)</strong></td>
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<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>18:00 – 20:00</td>
<td><strong>Welcome party (at Hou-ou hall, 30th floor of Hotel Nikko Niigata)</strong></td>
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## Mon. Jun. 2

### Invited Lecture (Room α)

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>9:00 - 9:20</td>
<td><strong>Opening Address</strong>&lt;br&gt;Yasuhiro Tanaka (Tokyo City Univ., Japan)</td>
</tr>
</tbody>
</table>
| 9:20 - 10:20  | **Inuishi Memorial Lecture**                                         Chair: M. Nagao (Toyohashi Univ. Tech.)
| Z1            | [026] Nanodielectrics - the First Decade and Beyond<br>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<br>George Chen (University of Southampton, UK and Xi’an Jiaotong Univ., China) |

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<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>11:40 - 13:00</td>
<td><strong>Lunch Break</strong></td>
</tr>
</tbody>
</table>
13:00 - 15:05  **Session A: Nano-composite #1  (Room α)**

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

A1 (SI)  [009] Modelling the Dielectric Permittivity of Nanocomposites – the Overlap Model

Ioana Preda\(^1\), Jérôme Castellon\(^1\), Michel Fréchette\(^2\), and Serge Agnel\(^1\) (\(^1\)Univ. Montpellier, France, \(^2\)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\(^1\), Liyuan Xie\(^1\), Fei Liu\(^1\), and Pingkai Jiang\(^1,2\) (\(^1\)Shanghai Jiaotong Univ., China \(^2\)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 Suzuki (Nagoya Univ., Japan)

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

**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\(^1\), Akiko Kumada\(^2\), and Tetsuo Yoshimitsu\(^3\) (\(^1\)The Univ. Connecticut, USA, \(^2\)The Univ. Tokyo, Japan, \(^3\)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. Inst.
15:20 - 17:00  **Session C: Nano-composite #2  (Room α)**  
Chair: M. Fréchette (Inst. Rec. d’Hydro Québec)

C1  [023] Polyethylene-based Nanodielectric Containing Octaisobutyl Polyhedral Oligomeric Silsesquioxanes Obtained by Hexane Slurry Blending  
Meng Guo¹, Michel Fréchette², Nicole R. Demarquette¹, Éric David¹, Hugues Couderc¹, and Jean-Christophe Daigle² (¹École de Technologie Supérieure, Canada, ²Inst. 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)

Masahiro Kozako¹, Masayuki Hikita¹, Masayoshi Sato², Goro Sato², Zarel Valdez-Nava³,⁴, Sombel Diaham³,⁴, and Thierry Lebey³,⁴ (¹Kyushu Inst. Tech., Japan, ²Sato Res. Co., Japan, ³Univ. Toulouse, France)

15:00 - 17:00  **PEA System Tutorial Program (Room δ) Application is required.**  
Lecturer: Y. Tanaka (Tokyo City Univ.). Assistant: Y. Kohno (Five Lab.)

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**Tue. Jun. 3**

9:00 – 12:30  **Session D: Space Charge Special Oral  (Room α)**  
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 Teyssedre (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 Fukuma¹, Hiroki Tomita¹, and Takashi Maeno² (¹Matsue Nat. College of Tech., Japan, ²Nat. 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 Wu¹, Zepeng Lv¹, Qingdong Zhu¹, Xia Wang¹, Yonghong Cheng¹, and L.A. Dissado¹,²
(¹Xi’an Jiaotong Univ., China, ²Univ. 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

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 Tanaka¹, Tsuyoshi Kato¹, Hitoshi Suzuki¹, Hiroaki Miyake¹, and Takashi Maeno²
(¹Tokyo City Univ., Japan, ²Nat. Inst. Information and Communication Tech., Japan)

DB4 [119] Preliminary Measurements on Dielectric Materials by the Pulsed Electro-acoustic Method Using a Ring Electrode
Virginie Griseri¹, Jonathan Riffaud¹, Takashi Maeno², and Laurent Berquez¹ (¹Univ. Toulouse, France, ²Nat. Inst. Information and Communication Tech., Japan)

10:50 – 12:30 Session E: Outdoor Insulation and Diagnosis #1 (Room γ)
Chair: Peter Morshuis (Delft Univ. Tech.)

E1 [020] Contrasting Analysis on Properties of Mechanical Fatigue and Solid Insulation during Aging Process
Hailiang Lu¹, Yifan Liao², Xiaqiong Yuan¹, Fuzeng Zhang², Jingzhuo Zhang¹, Bao Wen¹, and
Xishan Wen¹ (¹Wuhan Univ., China, ²Ultra 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 Zhao¹,², Xiao-jun Tang¹, Zhong-hua Zhang¹,³, and Jun-hua Liu¹ (¹Xi’an Jiaotong Univ.,
China, ²Xi’an Univ. Sci. Tech., China, ³Nat. 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)
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. Bramantyo¹, F. Ciani², S. Serra², P. H. F. Morshuis³, A. Cavallini⁴, and G. C. Montanari²,⁴  
¹Institut Teknologi Bandung, Indonesia, ²Techimp SpA, Italy, ³Delft University of Technology, the Netherlands, ⁴University 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 Kim¹, Taketo Unok¹, Yoshinobu Murakami¹, Masayuki Nagao¹, Takashi Kurihara², Tatsuki Okamoto², Kazuhisa Miyajima³, Katsumi Uchida³, and Naohiro Hozumi¹  
¹Toyohashi Univ. Tech., Japan, ²Central 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 Hao¹, Jin Fu¹, Zhiqin Ma², Shihai Zhang¹, and Shan Shen¹  
¹State Grid Chongqing Electric Power Co., China, ²Guangdong 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 Murakami¹, Takuma Sugiyama¹, Tomohiro Kawashima¹, Masumi Fukuma², and Masayuki Nagao¹  
¹Toyohashi Univ. Tech., Japan, ²Matsue 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\(^1\), Takashi Maeno\(^1\), Hiroaki Miyake\(^2\), and Yasuhiro Tanaka\(^2\) (\(^1\)Nat. Inst. Information and Communications Tech., Japan, \(^2\)Tokyo City Univ., Japan)  

DS7 [172] Wire cable PEA  
Kazuki Abe\(^1\), Takashi Maeno\(^1\), Hiroaki Miyake\(^2\), and Yasuhiro Tanaka\(^2\) (\(^1\)Nat. Inst. Information and Communications Tech., Japan, \(^2\)Tokyo City Univ., Japan)  

DS8 [174] Space Charge Measurement for Thick Sample in PEA Method  
Masumi Fukuma\(^1\), Hiroki Tomita\(^1\), and Takashi Maeno\(^2\) (\(^1\)Matsue Nat. College of Tech., Japan, \(^2\)Nat. Inst. Information and Communications Tech., Japan)  

15:45 - 17:10  
Session G: Partial Discharge  (Room α)  
Chair: T. Czaszejko (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\(^1\), S. Miyazaki\(^1\), T. Takahashi\(^1\), T. Takahashi\(^1\), O. Kato\(^2\), and Y. Hayashi\(^2\) (\(^1\)Central Res. Inst. Electric Power Industry, Japan, \(^2\)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\(^1\), Daiki Asai\(^2\), Yasuo Suzuoki\(^2\), and Toru Kawahara\(^3\) (\(^1\)Toba Nat. College of Tech., Japan, \(^2\)Nagoya Univ., Japan, \(^3\)Chubu Electric Power Co., Japan)  

15:45 - 17:30  
MVP and Poster Session #1  (Room β)  

MVP Group IA Coordinator: M. Kozako (Kyusyu Inst. Tech.)  

VA1 [056] Structural Change Induced in LaAlO\(_3\) 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\(^1\), T. Bengtsson\(^1,2\), J. Blennow\(^1\), and S. M. Gubanski\(^1\) (\(^1\)Chalmers Univ. Tech., Sweden, \(^2\)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
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 Niasar¹, Respicius Clemence Kiiza¹, Nathaniel Taylor¹, Xiaolei Wang¹,
Hans Edin¹, and Stefan Tenbohlen² (¹KTH Royal Inst. Tech., Sweden, ²Univ. 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 Billard¹², Thierry Lebey¹², Antoine Belinger¹², Nicolas Naude¹², and Nicolas
Gherardi¹² (¹Univ. Toulouse, France, ²CNRS, France)

VA7  [079] Partial Discharge Detection and Analysis of Oil-paper Insulation under dc Voltage Based on UHF
Method
Qian Zhang¹, Hongliang Liu², Zhe li¹, Zhihao Wang¹, and Yi Yin¹ (¹Shanghai Jiaotong Univ.,

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

VA8  [061] Crystalline Structures of YAlO₃ 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 Kiiza, 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
Wales Australia)

VA12  [125] Characteristics of Discharge Generation across Insulation Barrier in the Oil/Pressboard Composite
Insulation System
Shigeyoshi Yoshida¹, Masahiro Kozako¹, Masayuki Hikita¹, Takahiro Umemoto², Soichiro
Kainaga², Hirotaka Muto², and Takao Tsurimoto² (¹Kyushu Inst. Tech. Japan, ²Mitsubishi
Electric Co., Japan)

VA13  [133] UHF Sensor Optimization Used for Detecting Partial Discharge Emited Electromagnetic Wave in
Gas Insulated Switchgear
Inu Suprianto¹², Umar Khayam², Suwamo², Kiichi Nishiguchi³, Mohamad Kamarolf,
Masahiro Kozako$^3$, and Masayuki Hikita$^3$ (1PT. PLN, Indonesia, 2Inst. Tek. Bandung, Indonesia, 3Kyushu Inst. Tech., Japan, 4Univ. 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$^1$, Yong Zhao$^2$, Wei Jia$^1$, Bin Han$^2$, Yiying Liu$^1$, Toshikatsu Tanaka$^3$, Yonghong Cheng$^1$, and Yu Chen$^1$ (1Xi’an Jiaotong Univ., China, 2Xi’an Thermal Power Res. Inst. Co., China, 3Waseda Univ., Japan)

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

VA15 [139] Optical Properties of Self-assembled Anisotropic Gold Nanoparticles
Ryotaro Ozaki$^1$, Nagao Yoshiki$^1$, Kazunori Kadowaki$^1$, Yutaka Kuwahara$^2$, and Seiji Kurihara$^2$ (1Ehime Univ., Japan, 2Kumamoto Univ., Japan)

VA16 [015] Partial Discharge Behavior of a Newly Developed Enamel Insulation at Various Voltage Rise Times
Anh T. Hoang$^1$, Thomas J. A. Hammarström$^1$, Tord Bengtsson$^{1,2}$, Yuriy V. Serdyuk$^1$, and Stanislaw M. Gubanski$^1$ (1Chalmers Univ. Tech., Sweden, 2ABB Co. Res., Sweden)

VA17 [129] Study of Direction Identification of Partial Discharge Using Multi Small Loop Sensors
Atsushi Inatomi$^1$, Shohei Makki$^1$, Masahiro Kozako$^1$, Masayuki Hikita$^1$, Tokihiro Umemura$^2$, Kazuo Iida$^2$, Yusuke Nakamura$^3$, Tatsuya Hirose$^3$, Teruhiko Maeda$^4$, and Masakazu Higashiyama$^4$ (1Kyushu Inst. Tech., Japan, 2Mie Univ., Japan, 3Toshiba Co., Japan, 4Toshiba Industrial Products System Co., Japan)

VA18 [155] Effect of Barrier in the Propagation of Partial Discharge Signals
R. Sarathi$^1$, I. P. Merin Sheema$^1$, and V. Subramanian$^2$ (1,2Indian 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$^1$, Tatsuki Okamoto$^1$, Kazuhsa Miyajima$^2$, Katsumi Uchida$^2$, Myong Hwan Kim$^3$, and Naohiro Hozumi$^3$ (1Central Res. Inst. Electric Power Industry, Japan, 2Chubu Electric Power Co., Japan, 3Toyohashi 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$^1$, Lu Pu$^1$, Guoqiang Huang$^1$, Yang Liu$^1$, Lisheng Zhong$^2$, Qinxue Yu$^2$, and Xiaolong Cao$^2$ (1Shaanxi Electric Power Res. Inst., China, 2Xi’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
VA24 [146] Influence of Prestressing on the Breakdown of Insulating Paper-Liquid Nitrogen Composite System

Tomohiro Kawashima¹, Yoshinobu Murakami¹, Masayuki Nagao¹, Yoshihiro Inagaki², Yuichi Ashibe³, and Takato Masuda² (¹Toyohashi Univ. Tech., Japan, ²Sumitomo Electric Industries, Japan)

VA25 [039] Dielectric Breakdown Characteristics of HTV Silicone Rubber under Multiple Stress Conditions

G. Haddad¹, K. L. Wong¹, and R. K. Gupta², (¹,²RMIT Univ., Australia)


G. Haddad¹, K. L. Wong¹, and P. Petersen² (¹,²RMIT Univ., Australia)

VA27 [060] Simultaneous Detection of Ammonia and Water Vapors Using Surface Plasmon Resonance Waveguide Sensor

Ryo Komai¹, Hiroki Honda¹, Akira Baba¹,², Kazunari Shinbo¹,², Keizo Kato¹,², Futao Kaneko¹,² (¹,²Niigata 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 Matsuzaki¹, Toshiyuki Nakano¹, Hideyasu Ando², and Masafumi Takei² (¹,²Toshiba 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. Arief⁴, Wan Akmal Izzati¹, Aulia¹, Zuraimy Adzis¹, Nor Asiah Muhamad¹, Mohd Nazren Mohd Ghazali¹, Mohd Ridhuan Mohd Sharp¹, and M. Z. H. Makmu² (Univ. Teknologi Malaysia, ²Univ. Malaysia, Malaysia)

PA5 [001] Evaluation of Insulation of H.V. Bushing - Online Monitoring tgd of a 500 kV Bushing

Yi Li¹, Mingjun Cheng¹, Huaping Xu¹, Shengjie Huang², and Herschel J. West² (¹China Southern Power Grid Co., China, ²Wuhan 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 Kadowaki¹, Teruki Abe¹, Ryotaro Ozaki¹, Izumi Tsujita², and Nobuyuki Kurisaka² (¹Ehime Univ., Japan, ²Ehime 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 Khayam1, Achmad Susilo2, Joko Muslim3, Yanuar Z Arief4, Suwarno1, Motoo Tsuuchie5, Masayuki Hikita6, (1Inst. Teknologi Bandung, Indonesia, 2PT PLN, Indonesia, 3Univ. Tek. Malaysia, Malaysia, 4Kyushu 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.)

H1 [126] Development of 250 kV HVDC XLPE Cable System in Korea
Soo-Bong Lee, Tae-Ho Lee, Eui-Hwan Jung, Yoon-Hyoun 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 Komatsu1, Tomoyuki Izutsu1, Yoshimichi Ohki1, Maya Mizuno2, Kaori Fukunaga2, Yoshiaki Nakamura3, Naofumi Chiwata3 (1Waseda Univ., Japan, 2Nat. Inst. Information and Communications Tech., Japan, 3Hitachi Metals, Japan)

H3 [140] Evaluation of Space Charge in Liquid Dielectric Using Kerr Electrooptic Method
Haruo Ihori1, Mitsuru Oka1, Yuji Nagaoka1, and Masaharu Fujii1 (Ehime Univ., Japan)

H4 [154] The Influence of Thermal Aging on ac Dielectric Strength of Transparent Silicone Rubbers for HV Insulation
Chaiyaporn Lothongkam1, Daniel Siebler1, Gerd Heidmann2, Ronald Plath3, and Ernst Gockenbach1 (1BAM Federal Inst. Materials Res. Testing, Germany, 2IPH GmbH, Italy, 3Tech. Univ. Berlin, Germany, 4Leibniz Univ. Hannover, Germany)

H5 [083] Total Dose Response of Al2O3-based MOS Structure under Gamma-ray Irradiation
Yonghong Cheng, Xin Liu, Man Ding, and Xiaolong Li (Xi’an Jiaotong Univ., China)

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<th>Session Time</th>
<th>Session Name</th>
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<td>9:30 - 11:15</td>
<td>MVP and Poster Session #2 (Room β)</td>
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<td><strong>MVP Group 2A</strong></td>
<td><strong>Coordinator: Y. Murakami (Toyohashi Univ. Tech.)</strong></td>
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<td>VB2</td>
<td>[057] Simulation Study on the Effect of Interface Charge between Oil and Paper</td>
<td>Kai Wu, Qingdong Zhu, Yang Tu, and Jie Dai (Xi’an Jiaotong Univ., China)</td>
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<td>VB3</td>
<td>[065] Characteristics of Space Charge Behavior and Conduction Current in XLPE and Annealed Polyethylene under High DC Stress</td>
<td>Tsuyoshi Kato, Ryo Onozawa, Hiroaki Miyake, Yasuhiro Tanaka, and Tatsuo Takada (Tokyo City Univ., Japan)</td>
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<tr>
<td>VB4</td>
<td>[029] Comparison of Dielectric Properties among Polydicyclopentadiene Resin, Epoxy Resin and Their Composites with Microsized SiO₂ Fillers</td>
<td>Yuki Masuzaki¹, Yoshimichi Ohki¹, and Masahiro Kozako² (1Waseda Univ., Japan, 2Kyushu Inst. Tech., Japan)</td>
</tr>
<tr>
<td>VB5</td>
<td>[132] Dielectric Properties of Olefin-based Thermosetting Resin for Application to Electrical Insulating Material</td>
<td>Keisuke Yoshida¹, Masahiro Kozako¹, Shinji Ishibe¹, Masayuki Hikita¹, and Nobuhito Kamei², (¹Kyushu Inst. Tech., Japan, ²RIMTEC Co., Japan)</td>
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<td>VB6</td>
<td>[159] The Relationship between Charge Decay Process and Current Density Differential on Polyimide and Fluoride Films Irradiated by Electron</td>
<td>Kohei Horiguchi¹, Yutaka Kikuchi¹, Virginie Griseri², Hiroaki Miyake¹, Yasuhiro Tanaka¹, Laurent Berquez², and Christian Laurent² (1Tokyo City Univ., Japan, ²Univ. Toulouse, France)</td>
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<tr>
<td><strong>MVP Group 2B</strong></td>
<td><strong>Coordinator: N. Hozumi (Toyohashi Univ. Tech.)</strong></td>
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<tr>
<td>VB7</td>
<td>[016] Influence of Paper Ageing on Space Charge Dynamics in Oil Impregnated Insulation Paper under dc Electric Field</td>
<td>Jin Fu¹, Jian Hao¹, Haibin Liu², Ke Li¹, Huailiang Cui¹, Wei Zhang¹ (¹State Grid Chongqing Electric Power Co., China, ²Univ. Chongqing, China)</td>
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<td>VB8</td>
<td>[066] Development of Space Charge Measurement System with High Positional Resolution Using Pulsed Electro Acoustic Method</td>
<td>Kensuke Kumaoka¹, Tsuyoshi Kato¹, Hiroaki Miyake¹, and Yasuhiro Tanaka¹ (Tokyo City Univ., Japan)</td>
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VB9  [087] Excess Electron States and Mobility in Polyethylene
    Yang Wang, Kai Wu, and David Cubero (Xi’an Jiaotong Univ., China, Univ. Sevilla, Spain)

VB10  [097] Development of a Space Charge Measurement Method without a Semiconducting Electrode
    (Toyohashi Univ. Tech., Japan, Univ. Seville, Spain)

VB11  [033] Analysis on Thermally Stimulated Currents in Polyethylene-terephthalate and Polyethylene-
    naphthalate
    Peng Yang, Yoshimichi Ohki, and Fuqiang Tian (Waseda Univ., Japan, 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, Arata Naoumi, Hiroaki Miyake, Yasuhiro Tanaka, and Takashi Maeno (Tokyo City Univ., Japan, 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, V. Santangelo, D. Fabiani, A. Saccani, M. Toselli, and M. F. Fréchette
    (Univ. Bologna, Italy, 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, Akinari Yamane, Akihiro Imakiire, Masahiro Kozako, Masayuki Hikita, Sorin Dinculescu, Zarel Valdez-Nava, and Thierry Lebey
    (Kyushu Inst. Tech., Japan, 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
    Qiongxia Zhong, Li Lan, Jiadong 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 Guo1, Yu Chen1, Zirui Jia1, Toshikatsu Tanaka2, Jielong Wu3, and Yonghong Cheng1
(1Xi’an Jiaotong Univ., China, 2Waseda Univ., Japan, 3Shanxi Electric Power Co., China)

VB22 [107] Space Charge Formations and Electrical Conductivities Characteristics of Nano Composite XLPE
J. H. Nam1, H. J. Jung1, Y. S Yang1, T. H. Lee1, W. K. Park1, J. T. Kim2, and J. H. Lee3 (LS Cable & System, Korea, 2Daejin Univ., Korea, 3Hoseo Univ., Korea)

VB23 [143] Toluene Decomposition in Humid Gas by Using Surface Discharges on Dielectric Subjected to Repetitive Voltage Pulses with Polarity Reversal
Kazunori Kadokawa, Yuji Mori, and Ryotaro Ozaki (Ehime Univ., Japan)

Poster Presentations
PB1 [091] Diagnosis of Degradation Condition of Materials Using Hydrophobic and Dielectric Analysis
Tetsuro Tokoro1, Hiroyuki Iwase1, and Masayuki Nagao2 (1Gifu Nat. College of Tech., Japan, 2Toyohashi 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 SiO2/CeO2 on the Dielectric, Ferroelectric and Piezoelectric Properties of (Ba0.7Ca0.3)(Zr0.2Ti0.8)O3 Ceramics
Wenfeng Liu, Daqi Zhao, and Shengtao Li (Xi’an Jiaotong Univ., China)

PB5 [045] Electrical Performance of Silicone Rubber/SiO2 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/SiO2 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
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.

Symposium Banquet (at Toki Ball Room, 4th 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)

11 [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)

12 [053] Residual Voltage Endurance of Generator Insulation Systems
Christof Sumereder and Mario Dolcic (Graz Univ. Tech., Austria)

13 [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)

M. R. Abdelmohaymen¹, Bahaa A. Araf¹, El-Sayed M. El-Refaie², and S. E. Kamal³ (¹Extra High Voltage Res. Center, Egypt, ²Helwan Univ., Egypt, ³Al-Azhar Univ., Egypt)

15 [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)

16 [153] Dielectric Strength Behavior and Mechanical Properties of Transparent Silicone Rubbers for HV Cable Accessories
Chaiyaporn Lothongkam¹, Philipp Rohwetter¹, Wolfgang Habel¹, and Ernst Gockenbach² (¹BAM Federal Inst. Materials Res. Testing, Germany, ²Leibniz Univ. Hanover, Germany)

17 [176] A Study on the Measurement of Electrical Conductivity of PPLP in LN\(_2\) for a Stop Joint Box of dc HTS Power Cable [Japan-Korea Young Researcher Exchange Program]
Jae-Sang Hwang¹, Hee-Suk Ryoo¹, Jung-Ho Kim¹, Jeon-Wook Cho², and Bang-Wook Lee¹ (¹Hanyang University, Korea, ²Korea Electrotechnology Res. Inst., Korea)
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<tr>
<th>Session J: Organic Materials (Room γ)</th>
<th>Chair: K. Shinbo (Niigata Univ.)</th>
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<td><strong>9:00 - 11:00</strong></td>
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| **J1** [094] Roles of Pore Structure and Type of Electrolyte on the Capacitive Performance of Activated Carbons Used in Electrical Double-layer Capacitors** | Seiji Kumagai¹, Koji Mukaiyachi¹, Masashi Sato¹, Nobuhito Kamikuri², and Daisuke Tashima²  
(¹Akita Univ., Japan, ²Univ. 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 (Toyoashi Univ. Tech., Japan) |

**11:10 - 11:20** Closing Remarks
SS (Sun Shine) Session

Coordinator: T. Imai (Toshiba Co.)

S1 [030] Introduction of Characteristics of Olefin-based Thermosetting Resin for Application to Electrical Insulating Material
   Nobuhiro 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 Nakamura¹, Ken-ichi Yamazaki¹, Takahiro Imai¹, Tamon Ozaki¹, Miwa Takeuchi¹, and
   Teruhiko Maeda² (¹Toshiba Co., Japan, ²Toshiba 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 Hiroshima¹, Tatsuya Hirose¹, Tetsushi Okamoto¹, TetsuoYoshimitsu², Sho Fukumoto²,
   Takayuki Sakurai², and Tomomi Ikegami² (¹Toshiba Co., Japan, ²Toshiba 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 Yukihiro 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)
| 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) |