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# MISCELLANEOUS

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## Photos on Front and Rear Covers

### Front Cover

#### **Laboratory of Advanced Technology Of Electrical Engineering and Energy, Graduate School at Shenzhen, Tsinghua University**

Advanced Technology of Electrical Engineering & Energy laboratory is part of the Shenzhen Branch of National Key Laboratory for Power System, and it is also supported by high voltage outdoor insulation Laboratory, Electrical Engineering department, Tsinghua University. The Laboratory is located in the Building L, Graduate School at Shenzhen, Tsinghua University. With an area of 320 square meters of laboratory, 150 square meters of offices and a total investment in equipment of 6 million RMB, Laboratory of Advanced Technology of Electrical Engineering & Energy ranks to the top level among universities worldwide, ensuring an academic and educational prestige in China.

Owning all kinds of advanced instruments, facilities, test-bed and power resource, the LAB devotes much research to basic theory and key technology of high voltage. Focusing on the international frontier technology and its application as well as the key problems in national economy, the LAB has taken a few projects from National Natural Science Foundation and projects at provincial or ministerial level. The LAB actively carries out the research on the formation mechanism and industrial application of atmospheric pressure glow discharge, and meanwhile applies for its key projects from National Natural Science Foundation.

The researches of the lab focus mainly on traditional high voltage insulation technology such as the compact transmission line, mechanism of gas discharge and electric power insulation problems at high altitude area, the high voltage discharge along the contaminated surfaces, high voltage experimental test, dielectric property of the high voltage materials and Ultra high voltage and etc. Other re-

searches includes the advanced technology of high voltage engineering for example water and exhaust gas treatment by the pulsed discharge plasma, nonthermal processing of liquid food by Pulsed Electric Field and etc.

There are 5 professors in the lab, including 2 academicians of the China national academy of engineering, 2 post doctor, 19 doctor candidate students and 23 master students.

The lab aims to become the south center and base of high voltage research, academic communion, and novel technology application. With the support of Shenzhen government and Tsinghua University, it will continue its contribution to electrical power development in China.

The photos of the front cover show:

The top photo: The Stable Post- Buckling Behavior of the Composite Insulator

The lower left photo: Composite insulator developed for high altitude areas

The lower right photo: High voltage novel technology which includes 1)water treatment by discharge plasma, 2) Liquid food processing by Pulsed Electric Field, 3)Automobile exhaust treatment by Plasma facilitated Catalysts

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## Rear Cover

### Partial Discharge Images of Magnet Wires under Inverter Surge Voltage

Inverter surge voltage is characterized by the rise time as short as nanosecond order and the repetition rate as high as kHz order. The inverter surge voltage may cause partial discharge (PD) and insulation degradation of magnet wires for inverter-fed motors used in environment-friendly vehicles and so on. Thus, PD characteristics and their measurement techniques have been discussed in IEEJ technical committee in conjunction with IEC and CIGRE activities.

The figure shows PD light emission images of a twisted pair composed of enamel wires for different magnitudes  $V_a$  of inverter surge voltage (rise time: 120 ns, pulse width: 10  $\mu$ s, single shot).

PD is generated in the wedge-shaped air gap of the twisted pair at the lower voltage levels and propagates along the surface of the enamel wire. At the higher voltage levels, PD extends to the lower electric field region on the backside of the enamel wire, where the outline of the twisted pair can be identified. These figures enable us to understand that insulation degradation of enamel wires can progress even in the lower electric field region, leading to fatal breakdown.

**Prof. Naoki Hayakawa and  
Prof. Hitoshi Okubo**  
(Nagoya University, Nagoya, Japan)

## Transactions of IEEJ

Six kinds of transactions are published. Five kinds of transactions are edited by five societies\* in IEEJ. The other one ( IEEJ Transactions on Electrical and Electronic Engineering ) is bimonthly published in English, which are edited by editorial committees in IEEJ and five societies in turn.

(\*) Five societies in IEEJ are as follows: (please visit <http://www.iee.or.jp/index-eng.html> )

- A: **Fundamentals and Materials Society** (This magazine is published from EINA Committee under this society.)
- B: Power and Energy Society
- C: Electronics, Information and Systems Society
- D: Industry Applications Society
- E: Sensors and Micromachines Society

### IEEJ Transactions on Fundamentals and Materials

Six issues of Trans. on F and M are published bimonthly in English in a year. Themes of recent issues in English are listed below (since the publication of EINA No.14 (2007)). The other issues include papers in Japanese or in English. On the whole in a year about a half of the papers are written in English. Any papers in any transaction can be read and downloaded at the website:

[http://www.jstage.jst.go.jp/browse/ieejfms/\\_vols](http://www.jstage.jst.go.jp/browse/ieejfms/_vols) .

#### (Themes of the recent issues published in English)

- Vol. 127-A No. 9 (Sept. 2007) Special Issue on Asian Conference on Electrical Discharge (ACED)
- Vol. 127-A No. 11 (Nov. 2007) Special Issue on Industrial Applications of Pulsed Power and Plasma Technologies
- Vol. 128-A No. 1 (Jan. 2008) Special Issue on Technology 2008 : Reviews & Forecasts
- Vol. 128-A No. 3 (Mar. 2008) Special Issue on History of Power Transmission Technology in Japan
- Vol. 128-A No. 5 (May 2008) Special Issue on Electrode Materials and their Technologies for the Fuel Cells
- Vol. 128-A No. 8 (Aug. 2008) Special Issue on Recent Progress in Power Magnetics and Related
- Vol. 128-A No. 10 (Oct. 2008) 2007 Japan-Korea Joint Symposium on Electrical Discharge and High Voltage Engineering

Contents are listed at <http://www2.iee.or.jp/ver2/honbu/90-eng/14-magazine/index.html>.

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### **IEEJ Transactions on Electrical and Electronic Engineering**

The journal "IEEJ Transactions on Electrical and Electronic Engineering" was launched in May 2006. It is an online magazine and published bimonthly from John Wiley & Sons, Inc. on the website:

<http://www3.interscience.wiley.com/cgi-bin/jhome/112638268>

### **IEEJ Technical Reports Related to Insulation**

Technical reports listed here are made by investigation committees in the technical committee on DEI and related investigation committees since the publication of EINA No.14 (2007). They are described in Japanese.

| No.  | Title  |      | Publ.date  | Price  |
|------|--|------|------------|--------|
| 1097 | "Recent Technology Trend on Maintenance of Medium- Voltage Switchgear"   | (B), | 2007/8/1   | ¥3,307 |
| 1101 | "Properties and Novel Functions of Organic and Composite Films by Nano- structure Control for Device Applications"   | (A), | 2007/10/25 | ¥3,780 |
| 1102 | "A report on the risk management and compatibility for lightning in information, communication and power system"     | (A), | 2007/10/25 | ¥4,095 |
| 1104 | "Life Extension Technologies for Large DC Machines"  | (D), | 2007/11/15 | ¥5,040 |
| 1105 | "Recent Technologies and Aging Phenomena of Accessories for HV and EHV XLPE Cables"                                  | (B), | 2007/12/5  | ¥7,087 |
| 1107 | "Current situation of Technology and Problem on Utility Pole Eliminating Program"                                    | (B), | 2008/1/30  | ¥5,197 |
| 1108 | "Economical Assessment of Insulation Diagnosis for Electric Power Apparatus"   | (A), | 2008/2/15  | ¥3,622 |
| 1109 | "Current Situation and Future Activities of Preventive Maintenance and Maintenance Technology for Public Facilities" | (D), | 2008/2/15  | ¥4,410 |
| 1113 | "Organic dielectric and electrical insulating materials for Information and Communications Technology"               | (A), | 2008/4/15  | ¥2,992 |
| 1115 | "Surge Phenomena in Low-Voltage and Control Circuits"  | (B), | 2008/5/1   | ¥4,567 |
| 1116 | "The reliability of high voltage circuit breaker and its improvement technology"                                     | (B), | 2008/5/15  | ¥4,410 |
| 1120 | "Design technology for Superconducting Device"   | (B), | 2008/6/30  | ¥4,252 |
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| 1125 | “Techniques of Limiting Measurement on Discharge Phenomena in Dielectric Liquids and Application of Liquids” | (A), | 2008/8/5  | ¥5,197 |
| 1129 | “Advanced computational techniques for practical electromagnetic field analysis”                             | (B), | 2008/9/10 | ¥5,512 |

N. B. : (A - E) after titles mean a Society in which Technical Committees work :

- A: Fundamentals and Materials
- B: Power and Energy
- C: Electronics, Information and System
- D: Industry Applications
- E: Sensors

¥: Japanese Yen

Abstract of the technical report can be seen on the web site:

<http://www.iee.or.jp/index-eng.html> --> “Publications”

or <http://www2.iee.or.jp/ver2/honbu/90-eng/13-publication/index.html>

## Application for Membership of IEEJ

A member of IEEJ receives a monthly journal (The Journal of The Institute of Electrical Engineers of Japan) and one transaction out of five (A: Fundamentals and Materials in which the activity of DEI is included, B: Power and Energy, C: Electronics, Information and System, D: Industry Applications, E: Sensors). The journal gives interesting readings about the latest science and technology in the field of Power Energy, Power Apparatus, Electronics, Information Engineering, Materials and so on. The transaction gives review papers, research papers, letters and other in-

formation.

Total fee for joining IEEJ as a general member is ¥ 12,400 which consists of initiation fee ¥ 1,200, annual membership fee ¥ 10,000 and overseas postage of journal ¥ 1,200 (¥ : Japanese Yen).

When you need more information or an application form, you can request them from membership section of IEEJ.

Please visit <http://www2.iee.or.jp/ver2/honbu/90-eng/12-bid/index.html>

## Way for Purchasing Proceedings of IEEJ Technical Meetings and IEEJ Technical Reports

- (1) Proceedings of Symposium on Electrical and Electronics Insulating Materials and Applications in Systems

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- (3) Technical reports

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