

Commission E (Electromagnetic Noise and Interference) Activity Report

October 2016 - February 2017

Commission E in Japan is holding technical meetings and sub-committee activities in collaboration with the Technical Committee on Electromagnetic Compatibility (EMCJ) of the Institute of Electronics, Information and Communication Engineers (IEICE), the Technical Committee on Electromagnetic Compatibility of the Institute of Electrical Engineers of Japan (IEEJ-EMC), IEEE EMC Society Japan Joint Chapter and Sendai Chapter, and some related technical groups.

Domestic academic activities of EMCJ and IEEJ-EMC:

1. Regular Meetings

The EMCJ of IEICE had five regular technical meetings and IEEJ-EMC had two technical meetings in the period of October 2016 to February 2017. These regular meetings were also technically co-sponsored by IEEE EMC Society Sendai Chapter and IEEE EMC Society Japan Joint Chapter. The October and December meetings were held as co-organized meetings of EMCJ and IEEJ-EMC. In the EMCJ meetings, 65 regular reports, three special talks, and two invited talks were presented, while 3 regular papers were presented as IEEJ-EMC. The total number of presentations is 73.

(<http://www.ieice.org/ken/program/index.php?instsoc=IEICE-B&tgid=IEICE-EMCJ>)

The featuring technical topics of the October meeting were “Microwave Technologies” and “Electromagnetic Simulation Technologies”, co-organized with the Technical Committee on Microwaves (MW of IEICE) and Electronics Simulation Technology (EST of IEICE).

In November, there were two regular meetings. The first one was co-organized with the Technical Committee on Wireless Power Transfer (WPT) and the Technical Committee on Photonics-applied Electromagnetic Measurement (PEM). The second one was held as the annual “EMCJ Young Researchers’ Presentation Meeting” which is co-sponsored by the Japan Institute of Electronics Packaging (JIEP) Electromagnetic Technology Committee.

The featuring technical topic of the December meeting was “Power Electronics EMC”, which has been attracting strong attention in accordance with recent advances of power electronics devices, and its application to distributed power supply and electric vehicles, etc.

Two invited lectures and three special talks listed below were presented in the EMCJ meetings of this period.

[Invited Lectures]

- (1) Prof. Yoshitada Iyama (NIT, Kumamoto College), "Communication Way in the 2016 Kumamoto Earthquake", Oct. 2016.

- (2) Prof. Kazuyuki Saito (Chiba Univ.), “Development of therapeutic devices by microwave energy”, Nov. 2016.

[Special Talks]

- (1) Prof. Shinobu Ishigami (Tohoku-gakuin Univ.), "Evaluation of the influence on communications of the electromagnetic noise caused by energy-saving apparatus", Oct. 2016.
- (2) Dr. Hideyuki Oh-hashii (Mitsubishi Electric Co.), “High Speed/High Frequency Signal Transmission Lines and Related EMC Problems”, Nov. 2016.
- (3) Prof. Nobuo Kuwabara (KIT), “Study of emitting and inducting phenomenon relating to telecommunication cable”, Jan. 2017.

2. Activity of sub-committees of IEEJ-EMC

As of February 2017, the following four sub-committees are continuing activities under the technical committee on EMC in IEEJ.

- (1) Investigation committee on EMC problems of smart grid and city.
- (2) Investigation committee on disturbance of transient electromagnetic fields to electronic equipment and wireless communications.
- (3) Investigation committee on technical trend of evaluation methods on electromagnetic field exposure.
- (4) Investigation committee on EMC problems of automotive (PHEV / EV).

The purpose of the sub-committee (4) is to give a perspective of solutions on EMC problems in automotive applications, particularly in the plug-in hybrid electric vehicles (PHEVs) and EVs, through the investigation into standardization trend related to automotive technology. It also is planning to create a new direction of EMC design in automotive environment with accumulation and utilization of basic technical data.

3. 28th EMC Workshop on Electrical and Electronic Equipment:

This series of workshop was started by EMCJ technical committee in 1989 as annual “EMC Workshops on Electrical and Electronic Equipment (Yuzawa Workshop)”. On Nov.10-11, 2016, the 28th workshop took place at Echigo-yuzawa, Niigata, under the topic of “The Next Generation EMC Roadmap Supporting the Green Society”.

In order to realize a green society that solves social problems such as global warming and energy problems, advanced use of electronic information and communication technology such as AI and big data is indispensable. However, new problems such as software definition hardware and mass customization cannot be dealt with by conventional technologies in individual fields. In this context, the importance of EMC approach is essentially growing.

This year's Yuzawa WS was planned with change in policy. In recent years, the necessity of gathering in Yuzawa WS has declined due to immobilization of participants and the reduction of cost of technical data access. Meanwhile, transfer of the technical knowledges from senior to young engineers has not been effectively carried out in design and manufacturing area. For this reason, Yuzawa WS aimed to build a human network of young and mid-age engineers to improve their technical capabilities and idea exchange through the creation of the “Next-generation EMC Roadmap for 2035”. Five areas for the roadmap were selected as the theme of group discussion;

communication technology, design / analysis technology, mobility technology, power electronics, inspection and measurement technology. The senior group discussed policy action plans at the nation level for the continued development of the EMC technology and preparation of basis of sustainable society. More than 60 engineers participated in the discussion and the results have been shared in the members.

IEEJ Technical Committee on EMC:

Chairperson: Ken Kawamata (Tohoku Gakuin University)
 Secretaries: Tomoo Ushio (Osaka University), Hidenori Sekiguchi (NMRI)
 Assistant Secretaries: Yu-ichi Hayashi (Tohoku Gakuin University)

EMCJ Technical Committee:

Chairperson: Hideaki Sone (Tohoku University)
 Vice Chairperson: Osami Wada (Kyoto University)
 Secretary: Hideki Osaka (Hitachi), Takehiro Morioka (AIST)
 Assistant Secretaries: Yoshiki Kayano (UEC Tokyo), Yusaku Katsube (Hitachi),
 Chie Sasaki (Panasonic)

Workshops and Symposiums on Natural Electromagnetic Noise:

One international meeting and a domestic meeting are listed below which our committee members were organized/presented the scientific results. Some detailed information on these meeting is provided below

International:

1. “AGU (American Geophysical Union) Fall Meeting”, 12-16 Dec, 2016, San Francisco, USA.
 (<https://fallmeeting.agu.org/2016/>)

This is one of the largest meetings in the field of geoscience in the world. About 24,000 scientists attended in this meeting. Scientific papers were presented in the field of atmospheric electricity, signal processing and seismo-electromagnetics by our members.

Domestic:

2. "95th Annual Meeting of Society of Atmospheric Electricity of Japan", 6-7 Jan, Kobe (<http://www.saej.jp/>)

This is the largest domestic annual meeting regarding the field of atmospheric electricity in Japan and totally 56 papers were presented including the natural electromagnetic noise during two days.

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- 4.

Future International Conferences and Meetings:

EMC:

The third EMCJ WS ⁽⁴⁾ will be held in Singapore in May 2017. This series of EMCJ-WS was started in 2015 as “once a year” annual regular EMCJ technical meeting outside Japan. The purpose is to encourage young engineers and researchers in Japan and East Asian area to present their works in English and to exchange information in international environment. This time the EMCJ WS 2017 will be hosted and co-organized by Nanyang Technological University, Singapore, with support of IEEJ TC-EMC, IEEJ-EC-MAG, IEEE EMC Society Singapore Chapter, Sendai Chapter and Japan Joint Chapters.

5. “EMC Joint Workshop 2017 Singapore (EMCJ WS 2017, Singapore)”, May 18–19, 2017, Nanyang Technological University, Singapore.
(<http://www.ieice.org/cs/emcj/jpn/regular/emcj-ws.html>)
6. "Asia-Pacific International Symposium on EMC (APEMC 2017)", June 20-23, 2017, Yonsei University, Seoul, Korea; (www.apemc2017.org)
7. “The 11th International Workshop on the Electromagnetic Compatibility of Integrated Circuits (EMC Compo 2017)”, July 4-8, 2017, Saint-Petersburg, Russia;
(www.emccompo2017.eltech.ru)
Submission of Final Paper: 23d May, 2017.
8. “2017 IEEE International Symposium on Electromagnetic Compatibility, Signal and Power Intergity (EMC + SIPI 2017)”, August 7-11, 2017, Washington DC, USA;
(<http://www.emc2017.emcss.org/>)
Final Paper Due: May 3, 2017.
9. “International Symposium and Exhibition on Electromagnetic Compatibility (EMC Europe 2017)”, September 4-8, 2017, ESEO Graduate School of Engineering, Angers, France;
(www.emceurope2017.org).
Final Submission Deadline: 15 May 2017

Natural Electromagnetic Noise:

10. “ISWL (International Symposium on Winter Lightning)”, 12-14 April, 2017, Joetsu, Japan.
(<http://www.iswl2017.jp>)
11. “EGU (European Geosciences Union) General Assembly 2017”, 23-28 April, 2017, Vienna, Austria. (<http://www.egu2017.eu>)
12. “JpGU (Japan Geoscience Union) Meeting 2017”, 20-5, May, 2017, Makuhari Messe, Chiba,

- Japan. (http://www.jpgu.org/meeting_e2017/)
13. "IWEP4 (International Workshop on Earthquake Preparation Process 4)", 26-27 May, 2017, Chiba, Japan. (<http://www-es.s.chiba-u.ac.jp/geoph/ulf/iwep4/>)^[1] Abstract submission deadline: April 30, 2017. ^[1]_[SEP]
 14. "IAPSO-IAMAS-IAGA Joint Assembly", 27 Aug.-1 Sept., 2017, Cape Town, South Africa. (<http://www.iapso-iamas-iaga2017.com/index.php>)