

Commission E (Electromagnetic Noise and Interference) Activity Report

September 2017 - June 2018

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. The 40th Anniversary of the EMCJ Technical Committee

The year 2017 was the 40th anniversary of the establishment of the Technical Committee on Electromagnetic Compatibility (EMCJ), which was founded in 1977 in the Institute of Electrical and Electronics Engineers (IECE) by the late Prof. Risaburo Sato of Tohoku University as the first committee chairman. To celebrate the anniversary year, we held a series of special lectures by IEICE fellows of EMCJ as the following (1)-(8). The lectures were presented in the monthly EMCJ meetings and the lecture slides were published in the 40th anniversary book of EMCJ, together with the manuscripts of the invited papers [1][2][3] which are the publications from IEICE for its 100th anniversary.

The series of special lectures (in Japanese)

- (1) “Engaged in research on electromagnetic noise across EMCJ and EMD”, July 2017, Hiroshi Inoue (Professor Emeritus, Akita University / Visiting Professor, The University of Electro-Communications).
- (2) “In the space between electric circuit theory and electromagnetism”, July 2017, Yoshio Kami (Professor Emeritus, University of Electro-Communications).
- (3) “EMC / radio technology learned through practice”, October 2017, Yoji Kotsuka (Emeritus Professor, Tokai University).
- (4) “Some trials on VHF/UHF EM-field imaging; recollections”, November 2017, Hiroshi Echigo (Emeritus Professor, Tohoku Gakuin University).
- (5) “EMC to talk to grandchildred”, January 2018, Liuji R. Koga (Emeritus Professor, Okayama University / EM Consulting)
- (6) “Engaged in basic research of communication EMC and international standardization of CISPR”, January 2018, Fujio Amemiya (NTT Advance Technology).

- (7) “Research trend of EMC and background of EMC engineers”, March 2018,
Shuichi Nitta (Professor Emeritus, Tokyo University of Agriculture and Technology).
- (8) “Looking back on my research and development - from development of optical cable to EMC research and standardization activities -“, March 2018,
Masamitsu Tokuda (Emeritus Professor, Tokyo City University).

- [1] Akira Sugiura and Katsumi Fujii, "Research and Development of EMC Measurement Technology —Radio Disturbance Measurement—", IEICE Trans. Commun. (Japanese Edition), Vol.J100-B, No.9, pp.593-601, Sep. 2017.
- [2] Tetsuo Ikeda, "EMC education and skill-tradition for young engineers"; 100 Year History of the IEICE "Chapter 7 Environmental Electromagnetic Engineering; Electromagnetic Compatibility", IEICE 2017.
- [3] Osamu Fujiwara, "Establishment of EMC Research in Japan and its Future Prospects", IEICE Trans. Commun. Vol.E100-B, No.9, pp.1623-1632, Sep. 2017.

2. Regular EMCJ Meetings

The EMCJ of IEICE had nine regular technical meetings in the period of September 2017 to June 2018. These regular meetings were also technically co-sponsored by IEEE EMC Society Sendai Chapter and IEEE EMC Society Japan Joint Chapter. In the EMCJ meetings. Three of them were co-organized with Technical Committee on Electromagnetic Compatibility of the Institute of Electrical Engineers of Japan (IEEJ-EMC). In total 132 regular reports including 10 invited talks were presented.

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

The featuring technical topic of the October meeting was “EM Simulation , EMC and Microwaves” and co-organized with the Technical Committee on Microwaves (MW of IEICE) and Electronics Simulation Technology (EST of IEICE). The November 2017 and June 2018 meetings were co-organized with the Technical Committee on Wireless Power Transfer (WPT). The second meeting in November 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 March meeting was co-organized by the Technical Committee on Healthcare and Medical Information Communication Technology (MICT) of IEICE.

International Meetings and Symposiums on EMC:

1. “International Symposium and Exhibition on Electromagnetic Compatibility (EMC Europe 2017)”, September 4-8, 2017, ESEO Graduate School of Engineering, Angers, France; (www.emceurope2017.org).

Domestic academic activities in the field of natural electromagnetic noise:

Commission E members in Japan working actively in the field of natural electromagnetic noise are presented their research results in the following meetings and symposium.

1. International conference/workshop

(1) 16th International Conference on Atmospheric Electricity (ICAE2018), Nara, Japan

This is the largest international conference in the field of atmospheric electricity held every 4 years. In 2018, this conference was held in Nara Japan from 17 to 22 June (<http://icae2018.saej.jp>), 20 years after the last ICAE in Japan (Osaka). The meeting was organized by International Commission on Atmospheric Electricity (ICAE) (<http://www.icae.jp/>) and Society of Atmospheric Electricity of Japan (SAEJ). Some of our E committee members in Japan worked as a LOC members of this conference (Professor Ushio: Co-chair, Professor Hobara: Program Chair and Prof. Morimoto: General Affair Chair). The meeting has 10 oral sessions and associated poster sessions in addition to the four keynote lecture in the morning. Every session has a different topic related to the atmospheric electricity such as lightning activity and related electrical and meteorological phenomena, atmospheric ions, global electric circuit etc. The meeting was quite successful and totally over 200 scientists were participated and 252 papers (oral 71, poster 181) were presented.

Following keynote lectures were presented by experts

- (1) 'Meteorological Aspects of Lightning and Thunderstorm Electrification',
Dr. Donald McGorman
- (2) 'Continued Mysteries of Lightning Studies'
Professor Paul Krehbiel
- (3) 'The Geostationary Lightning Mapper: Its Design, Performance and Capabilities'
Dr. Hugh Christian
- (4) 'Energetic Radiation in Thunderstorms and Lightning'
Professor David Smith

(2) 50th Anniversary International Workshop of Center for Space Science and Radio Engineering (SSRE) in UEC Tokyo, Japan

Center for Space Science and Radio Engineering (former Sugadaira cosmic radio wave observatory) in the University of Electro-Communications (UEC) celebrates 50-year anniversary and invited scientists to present all aspects of experimental and theoretical results in relation with measurement of natural and man-made electromagnetic signals such as space weather and solar terrestrial environment, atmospheric electricity, climate change, severe weather, lightning damage and protection, Ionosphere, radio astronomy, electromagnetic compatibility. The meeting was held in UEC on 25~26 June. Eight guest speakers from overseas and 9 guest speakers from Japan in addition to the SSRE and UEC speakers including two E

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committee members delivered the scientific talks. Totally over 60 people were attended the two-day workshop and enjoyed presentations by experts from different research fields and exchanged ideas and obtained new insights to understand the interdisciplinary topics.

(3) American Geophysical Union (AGU) Fall Meeting 2017

This international conference is held every year in December in USA and the largest one in the field of Earth and space science. This year, the meeting was held in New Orleans, Louisiana from 10 to 14 December. More than 20,000 scientists were attended. Several URSI-E committee members were presented the papers in the field of atmospheric electricity and seismo-electromagnetics.

2. Domestic conference/workshop

(1) Japan Geoscience Union (JpGU) Meeting 2018

This is the largest domestic meeting in the field of geoscience. The meeting was held in Makuhari Messe Exhibition Hall, Chiba from 20 to 24 May. Over 8,000 people were attended. Several URSI-E committee members were presented the papers in the several scientific sessions regarding atmospheric electricity and seismo-electromagnetics.

(2) Society of Atmospheric Electricity of Japan (JAE) annual meeting 2018

This is an annual meeting held in January. In 2018, the meeting was held in the Tokyo University of Science, Kagurazaka campus on 6 and 7 January and more than 70 scientific papers were presented. Several URSI-E committee members were presented the papers.