

Commission D (Electronics and Photonics) Activity Report

April 2014-July 2014

August 6, 2014

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1. Commission Activities

URSI GASS 2014: program of two sessions proposed by Commission D of Japan was fixed;

- 1) Broadband Ubiquitous Network with Wired and Wireless convergence (August 19, 2014).
- 2) Trends in THz Communications (August 22, 2014).

National Report: 11 Members contributed to overviewing recent remarkable advances in their specialized areas such as Metamaterials (E. Sano, Hokkaido Univ.), Mid-infrared Quantum Cascade Lasers and Antennas (K. Kasahara, Ritsumeikan Univ.), THz Parametric Amplifier (K. Kawase, Nagaya Univ.), Broadband Continuous THz Wave Emitters and Detectors (H. Ito, Kitasato Univ.), Plasmonic Device Technology for Emission and Detection of Terahertz Radiation (T. Otsuji, Tohoku Univ.), Photonic Microstructures for Silicon Photonics Applications (M. Fujita, Osaka Univ.), Microwave Multiplexers for Readout of Superconducting Detector Array (S. Kohjiro, National Institute of Advanced Industrial Science and Technology), High Capacity Optical Fiber Transmission Systems (H. Toda, Doshisha Univ.), Small Cell Configurations using RoF Entrance Network Technologies (K. Tsukamoto, Osaka Institute of Tech.), Convergence of Wireless and Wired Technologies towards Next Generation Access Networks (K. Iwatsuki, Tohoku Univ.), Optical Access Technologies for Mobile Fronthaul (J. Kani, NTT). Total number of pages counts 84.

URSI-JRSM 2014: From commission D, an invited talk was finalized; Impact on Society and Industry due to Fusion of Light and Radio Waves in Future Information Communication Technologies, by Naoto Yoshimoto (Chitose Institute of Science and Technology)

ICTRS 2014: T. Nagatsuma attended the ICTRS 2014 (organized by URSI Bulgaria) held on June 26-27 in Luxemburg to give a talk on the topic covered by Commission D; Terahertz Wireless Communications Using Resonant Tunneling Diodes as Transmitters and Receivers.

2. Domestic activities related to areas covered by Commission D***Technical Committee on Microwave Photonics (IEICE):***

Following technical meetings were held on specific subjects including regular contributions:

April 17, 2014 (Sapporo); microwave photonic functional devices based on optical modulators, photonic generation of millimeter-wave signals, optical waveguide and fibers, radio-over-fiber

(RoF) technologies, etc.

July 17-18 (Murooran); photonic beam forming technologies, radio-over-fiber (RoF) technologies, microwave photonic transceivers, etc. (jointly held with related technical committees referring to as light-radio wave workshop)

3. International activities related to areas covered by Commission D

Global Symposium on Millimeter-Waves (GSMM2014):

The conference was held on May 21-23, 2014 at The-K Seoul Hotel, Seoul, Korea. Plenary speeches were on The Mm-wave and THz Band as a Transition Region (K. Mizuno, Tohoku Univ.), and 5G Mobile Communications for 2020 and Beyond – Vision and Key Enabling Technologies (W. Roh, Samsung Electronics Corp). Main topics of sessions were millimeter-wave and THz-wave technologies and their applications to sensing and communications.

International Microwave Symposium (IMS 2014):

The conference was held on 1-6 June in Tampa, USA. Though this conference covers radio-wave technologies, majority of papers were on higher frequency regions such as millimeter waves and terahertz waves. Recent statistics on number of workshops, short courses, sessions, and papers at IMS, which are related to millimeter waves and terahertz waves are summarized as shown in the table.

Year	Number of WS and SC on millimeter & THz/total	Number of technical sessions on millimeter & THz/total	Number of technical papers on millimeter & THz/total	Remarks
2011	1/39 (2%)	4/64 (6%)	36/444 (8%)	Only one WS on imaging
2012	5/47 (11%)	8/83 (10%)	82/612 (13%)	WS increased and new topic on THz Communications
2013	5/41 (12%)	15/73 (20%)	114/425 (27%)	Topics on integration, design and measurements

WS: Workshop SC: Short course

OptoElectronics and Communication Conference (OECC2014):

The conference was held on July 6-10, 2014 at the Melbourne Convention and Exhibition Centre (MCEC), Melbourne, Victoria. Papers on system applications are majority. Although the main topics of the conference is fiber-optic communications technologies, the convergence of microwave and photonics technologies in terms of enabling techniques and applications is one of the important topics to attract audiences.