

Commission D (Electronics and Photonics) Activity Report

November 2009-February 2010

March 2, 2010

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1) Commission Activities*AP-RASC2010:*

Most members of Commission D are responsible for conveners in AP-RASC2010, and are working hard to organize five (5) sessions by first collecting invited speakers. Currently, 10 speakers have accepted invitation.

URSI-GA2011:

Together with Franz Kaertner of MIT, Rene Beigang of University of Kaiserslautern, Germany and myself have submitted proposal for joint sessions between D and possibly commissions A and F on millimeter-wave and terahertz-wave technologies; “Enabling technologies for millimeter and THz wave applications”, and “Millimeter and THz wave applications, including NDT, security, communication, sensors, spectroscopy, etc.”

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

1st Meeting: November 13, 2009 at Tokyo Institute of Technology (Tokyo)

“Recent millimeter-wave and free-space optics technologies and their future trends”

4 invited and 4 contributed papers

2nd Meeting: January 27, 2010 at Advanced Institute of Science and Technology (Osaka)

“Hot topics in microwave photonics”

5 invited and 5 contributed papers

International Workshop on Terahertz Technology: TeraTech'09:

November 30 to December 3, 2009 at Osaka University Nakanoshima Center (Osaka)

40 invited and 100 contributed papers

Recent Domestic Organizations on Terahertz Technologies and Their Activities

Terahertz (THz) electromagnetic waves, which cover an unexplored portion of spectrum between infrared and microwaves at frequencies from 100 GHz to 10 THz, have been expected to offer innovations in sensing, imaging, spectroscopy, and communications. In Japan, several

organizations, which contribute to accelerate the THz science and technology in both academic societies and industries, have been established; Terahertz Technology Forum, Technical Group on Terahertz Application Systems in the IEICE, Terahertz Technology Professional Group in the Japan Society of Applied Physics (JSAP), Technical Group on Terahertz Electromagnetic-wave Industrial Applications in Japan Science and Technology Agency (JST), Division of Terahertz Spectroscopy in Spectroscopical Society of Japan, etc.

Terahertz Technology Forum held a unique seminar called “Terahertz Business Seminar: Terabiz 2010” on January 22, 2010 in Tokyo, since terahertz technologies are reaching a tipping point from scientific interests to industrial applications as shown in Fig. 1.

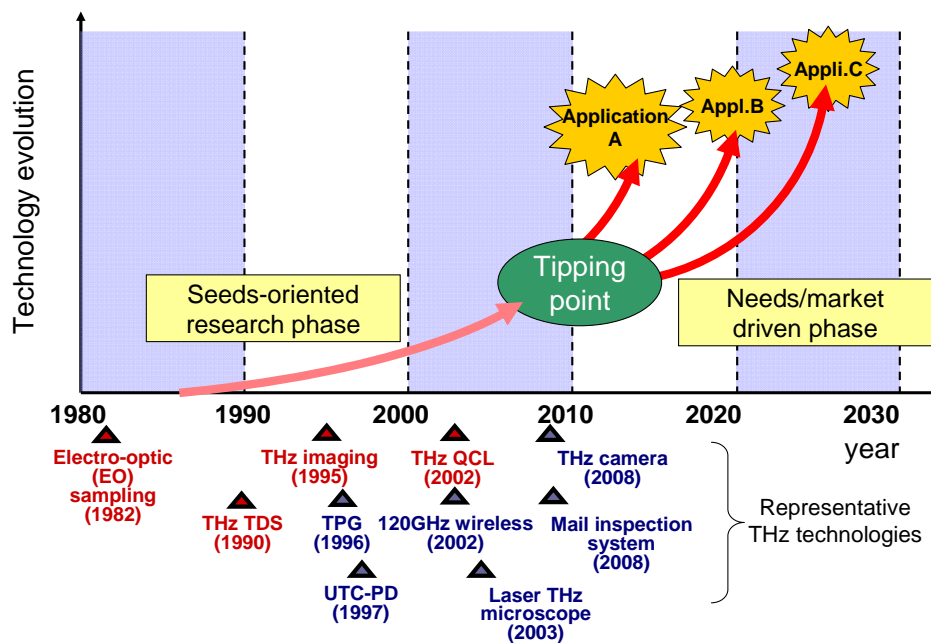


Fig. 1 Evolution of terahertz technologies.

One of the newest organizations is the study group on THz ICT, which was started in September 2009 at Kinki Bureau of Telecommunications in Ministry of Internal Affairs and Communications (MIC). Main points in monthly study meetings are as follows;

- 1) Needs of high-speed wireless communications
- 2) Advantages of terahertz waves
- 3) Feasibility of THz communications including enabling devices
- 4) Strategy for development of THz communications and future frequency allocation issue

Figure 2 shows possible application scenes of terahertz communications, discussed in the study

group. In addition to regular meeting, an open experiment of THz communications was demonstrated at Osaka Nakanoshima Center on January 29, 2010.

For details, <http://www.soumu.go.jp/soutsu/kinki/studygroup/2009/THz/index.html>

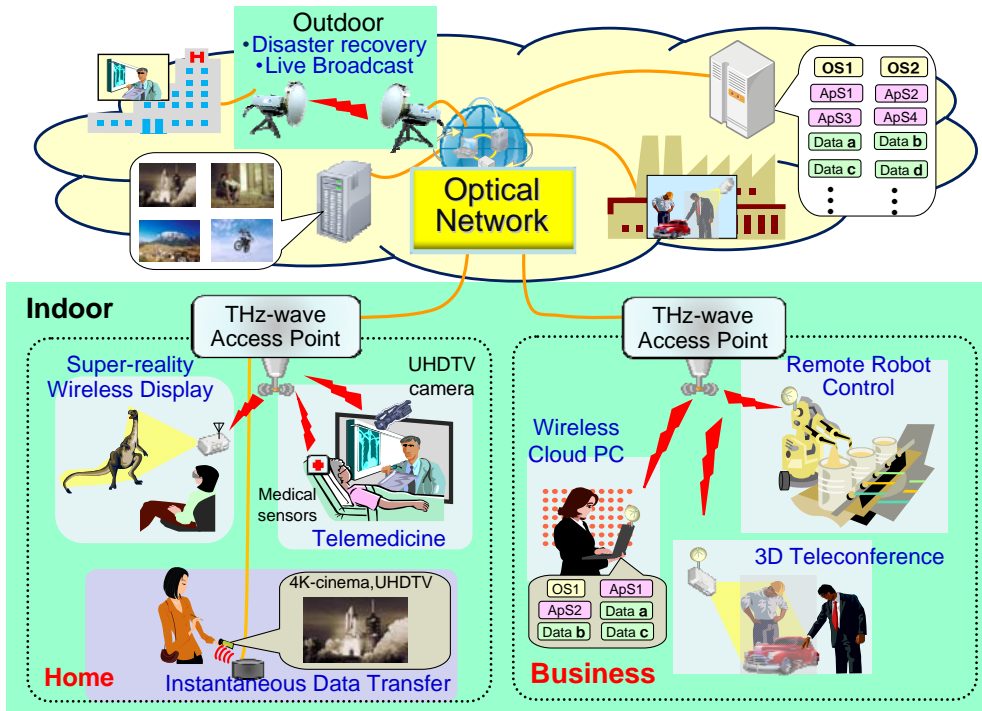


Fig. 2 Possible applications of terahertz communications.