
Triennial Report of Commission D
Frédérique de Fornel
Commission Chair
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During this triennial covering the period of October 2005 to August 2008 has supported the following conferences:

- APMC 2006 Asia-Pacific Microwave conference , Yokohama, Japan, 12-15 - december 2006
- Telecom & JFMMA, Fes, Morocco, 14-16 March 2007
- EMC Zurich 2007, Muenchen, Germany, 24-28 September 2007
- Metamarerial's 2007 The first International Congres on Advanced Electromagnetic Materials for Microwaves and Optics, Rome, Italia, 22-2- October 2007
- ISSSE 2007, Montreal, Canada , 30July- 2 August 2007
- EMC 2009 VIII International Symposium and Exhibition on Electromagnetic Compatibility and Electromagnetic Ecology, St Petersburg, Russia, June 2009

D – Scientific

D commission have supported new domain of Nanosciences and thus, a few issues have emerged.

– New scientific research areas.

New research areas, like nanooptics and nanoelectronics have emerged as a result of innovative thinking. The URSI communaity is still to dispersed. D commission needs effort to have a common action with other scientifics organism.

– New applied research areas

The emergence of NanoTechnology in the domain of RFID has changed the sensor technology. Inceasing collaboration with other Commissions, , becoms a necessity.

– Microwave and millimeter wave imaging

Microwave and millimeter wave imaging is a domain in full development. The interest of such a domain concerns directly the D commission..

Commission D Scientific Program at General Assembly, GA 2008

1- Oral Sessions

RFID Technology and Applications,

Covener : Prof. S. Tedjini, INPGrenoble

Summary: The birth of the Radio Frequency IDentification (RFID) was in October 1948 after the paper of H. Stockman "Communications by Means of Reflected Power". One of the first application was "Identification of Friend of Foe" (IFF) for aircraft. Nowadays, the technological advances in microelectronics, microwaves, and embedded software are drastically expanding the application field of the RFID. This session will address the current development of RFID system including tags and readers.

Optical Devices includind guided waves

proposer : prof Thyagarajan K. Thyagarajan

Summary: This session could include both linear and nonlinear optical effects in guided waves. It concerns plasmonic optical waveguides, waveguides based on photonic crystals and Bragg effects, parametric down conversion and four waves mixing in guided waves to generate entangled photon pairs etc.

Surface Plasmon (DB)

coveners : F. de Fornel (com. D)

Nader Engheta (com B)

H. Nedwill Ramsey (com B)

Summary: Surface plasmons are interfacial electromagnetic modes that can be exploited to control the propagation and local oscillation of electromagnetic energy. This topical conference will explore fundamental and applied plasmonic concepts, the control and manipulation of local and propagating surface plasmons, plasmon dynamics, and novel plasmonic nanostructures.

Transistor session

Convener : Mikael Östling

Summary:

The session called "Ultimate limits in transistor performances" should be composed of a series of different invited talks where each talk should focus on a particular transistor technology. The session should cover;

- 1) Ultimate high frequency performance bipolar transistors in SiGe HBT technology as well as in III-V technology
- 2) Ultimate high frequency CMOS transistor performances
- 3) Ultimate high frequency performances for emerging techniques. i.e carbon nanotube transistors
- 4) Ultimate high speed performances in spintronic transistor technology.

Modeling of high frequency devices and circuits.

covener : Samir M. El-Ghazaly Samir

Summary: The demand for high-frequency devices and circuits is steadily growing. Increased commercial and personal use of wireless technology is a major driver for the increased demand. Moreover, there is a staggering need for high-speed digital circuits to satisfy the requirements for faster computers, which proliferate in the form of computational tools or as embedded systems. The main characteristics of new technologies include high-density circuits, relentless miniaturization, low-cost materials, low power, and fast design cycles. To meet strict standards and satisfy often-conflicting requirements, device and circuit designers rely heavily on accurate modelling tools to achieve first-path success. Hence, new device and circuit modelling and simulation tools are needed. This session reviews the latest developments in this area.

3 - TUTORIAL D

Manipulating light on a silicon chip

Speaker : Mickal Lipson, Cornell University

Poster Sessions I and II:

Conveners: F. de Fornel, <ffornel@u-bourgogne.fr>

F. Kaertner, <kaertner@mit.edu>

Summary: Contributed papers related to :

- (a) Electronic devices, circuits, systems and applications;
- (b) Photonic devices, systems and applications;
- (c) Physics, materials, CAD, technology and reliability of electronic and photonic devices *down to nanoscale including quantum devices*, with particular reference to radio science and telecommunications.