Duration: 08:30 - 17:50
Room: Stockholm

WM-08
Novel Fabrication Technologies for Sub-Millimeter Wave to THz Applications

Organisers:
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Abstract
As space and terrestrial applications at submillimetre-wave and THz frequencies are evolving, there is a need for new technology solutions providing increasing frequencies, larger bandwidths, reconfigurability, low-weight and size, and product uniformity and volume manufacturability. Advanced radiometre and radar imaging systems have already proven the benefits of novel technologies, including silicon micromachining, and other applications are now closely following. The new demands at these very high frequencies are currently tried to be met by recent development in high-precision milling, additive manufacturing strategies or micromachining processes with photolithographic technology. Within the latter approach, the currently most promising fabrication techniques are silicon deep reactive ion etching (DRIE) and thick-film polymer molds (for instance using SU-8) for forming high performance sub-THz waveguides. Improved fabrication and metal coating processes for components/systems including tunable elements using also MEMS technology will be explored in this workshop. The target will be the manufacturing of components / complete systems at submillimetre-wave and THz frequencies for a wide range of possible applications. The fundamentals as well as the latest results will be reviewed, making the workshop adequate both for the specialist and the newcomer.

The contents of this workshop are coordinated with the workshop proposal “Fundamentals and Engineering Considerations of THz Technologies: from Devices to Applications” to provide to the conference attendees a broad and complementing experience of workshops on THz technology without redundant content, with the focus of our workshop being specifically novel fabrication technologies.

Programme

08:30 - 08:40 WS Presentation

08:40 - 09:25 Millimeter-Wave to THz Radiometer Systems for Remote Sensing of the Earth's Atmosphere from Small Satellite Constellations
Steven C. Reising, Colorado State University, USA

09:25 - 10:10 Literature Review and Manufacturing Challenges of Key Components for Millimeter-Wave Radiometers
Miguel A. G. Laso, Public University of Navarre, Spain
Petronilo Martin-Iglesias, European Space Agency, The Netherlands

10:10 - 10:50 Break

10:50 - 11:35 3D-Micromachining with Integrated MEMS Enabling Reconfigurable Submillimeter-Wave and THz Systems
Joachim Oberhammer, KTH, Sweden

11:35 - 12:20 Receiver Technologies for Submillimeter-Wave Remote Sensing
Imran Mehdi, JPL, USA

12:30 - 13:50 Break

13:50 - 14:35 Waveguide Based Millimeter Wave Multipliers Using Novel Matching Structures
Michael Lancaster, The University of Birmingham, UK

14:35 - 15:20 Advances in Fabrication Technologies for Sub-Millimeter Wave and THz Applications at UC Davis
Neville Luhmann, UC Davis, USA

15:30 - 16:10 Break

16:10 - 16:55 Investigation on 3-D Printing Technologies for Millimeter-Wave and THz Applications
Bing Zhang, National University of Singapore, Singapore

16:55 - 17:40 Developing THz Components Using Low-Cost Fabrication Technologies
Zhang-Cheng Hao, Southeast University, China