



Large Scale Collaborative Project

DOTSEVEN

Towards 0.7 Terahertz Silicon Germanium
Heterojunction Bipolar Technology

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Section 1 - Executive summary

A workshop called “THz-Workshop: Millimeter- and Sub-Millimeter-Wave circuit design and characterization” was held in Venice, Italy, on September 26, 2014. In order to maximize the impact, this event was organised just the day after the joint ESSDERC/ESSCIRC conference.

The purpose of this full-day workshop was to discuss state-of-the-art methods and techniques used to design mmWave and sub-mmWave circuits and how to measure them. The design of (sub-)THz elementary building blocks such as LNA, PA, oscillators and mixers, as well as on-chip antennas, were discussed; a framework for selecting the appropriate measurement technique was given.

Furthermore, SiGe-based integrated mmWave sensors were reviewed and challenges in the integrated design, for testing, as well as concepts for future applications, have been treated, followed by insights how to come from an application driven R&D design to a qualified product.

1.1 Description of the Workshop Program

Programme

Opening and Welcome (8h45), Thomas Zimmer, University of Bordeaux

Session 1: Circuit building blocks (9h00-10h30)

- 9:00 *Coherent sub-THz transmission systems in Silicon technologies: design challenges for frequency synthesis* Alexandre Siligaris, CEA-Leti, Grenoble, France
- 9:30 *Circuit building blocks for millimeter and sub-millimeter-wave systems* Ullrich Pfeiffer, University of Wuppertal, Germany
- 10:00 *Millimeter-wave amplifiers for E- and V-band wireless backhaul* Erik Öjefors, SiversIMA, Sweden

- 10:30 Coffee break

Session 2: : Characterization (11h00-12h30)

- 11:00 *Measurement and characterization of circuits in the mm-wave and sub-THz range* Marco Spirito, Technical University of Delft, Netherlands
- 11:30 *Nonlinear distortion in mm-wave SiGe HBTs: Modeling and measurements* Paulius Sakalas, University of Dresden, Germany
- 12:00 *Accuracy investigations of calibration and de-embedding techniques* Manuel Potereau, University Bordeaux 1, France

-12:30-13:30: Buffet lunch

Session 3: mm-wave systems (13h30-15h00)

- 13:30 *Integrated mm-wave sensors with antenna-in-package: From concepts to applications,* Andreas Stelzer, Johannes Kepler University Linz, Austria
- 14:00 *Toward 100-Gbit/s 240-GHz short-range communication using SiGe-transceivers and an FPGA-based baseband,* Mats Alexanderson, Trebax, Sweden
- 14:30 *From Research to Industry: Highly integrated mm-wave transceiver for automotive radar applications,* Erich Kolmhofer, Infineon - DICE GmbH & Co KG, Austria

15:00 End of Workshop

1.2 Brief description of announcement strategy

The announcement has been carried out through 5 information channels:

1. ESSDERC Webpage :
<http://www.essderc2014.org/en/sistemacongressi/european-solid-state-device-conference-2014/website/home/workshops/>
2. ESSCIRC Webpage :
<http://www.esscirc2014.org/en/sistemacongressi/european-solid-state-circuits-conference-2014/website/home/workshops/>
3. Use of the Mailing lists of the DOTSEVEN consortium
4. Use of the Mailing list of the ESSDERC Technical Program Committee
5. Use of the Mailing list of the ESSCIRC Technical Program Committee

1.3 Attendees

Attendees:

About 20 participants attended the workshop from all over the world, including especially attendants even from Japanese companies and research institutes.

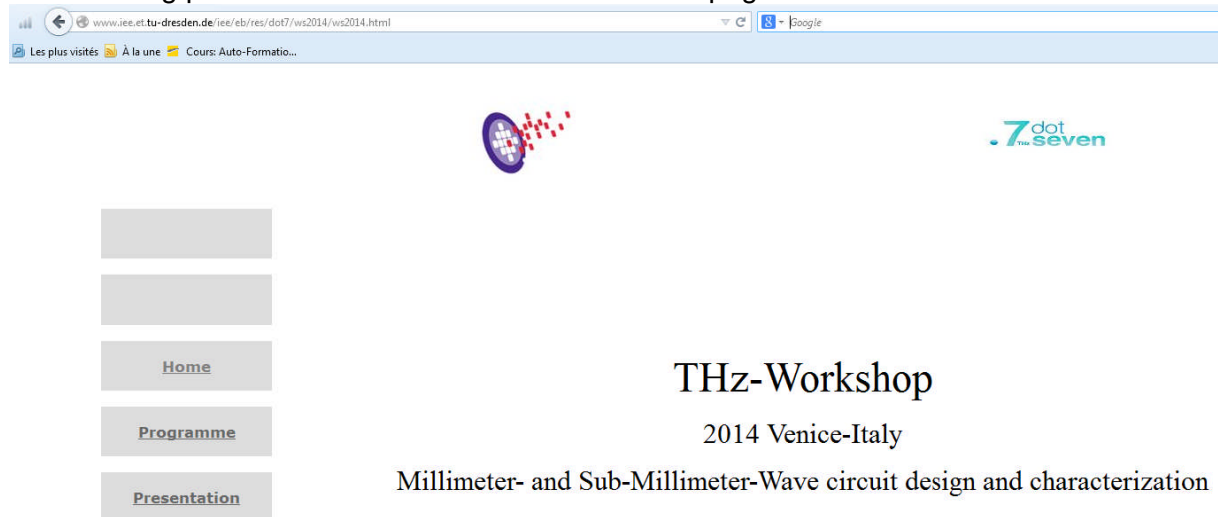
1.4 Webpage for downloading the presentations

The workshop presentations have been made publicly available on a website managed by a dedicated system administrator of TUD.

The URL is:

<http://www.iee.et.tu-dresden.de/iee/eb/res/dot7/ws2014/ws2014.html>

The following picture shows the screenshot of the webpage.



1.5 Feedback from the audience

The feedback from the audience was positive. The attendees appreciated in particular, to get an overview about the mmWave and sub-mmWave design activities that are actually carried out in Europe.

1.6 Impact

Due to the sustainable interest of the research community and industry on circuits and systems working in the sub-THz and THz range, we plan to organize the next year DOTSEVEN Workshop during the European Microwave Week in order to maximize the impact.

1.7 Publishable information

All information is public and the presentations are downloadable from a specific website (see above).

1.8 Conclusion

A workshop was organized where the objectives and the main results of the second year of the DOTSEVEN project have been presented. This workshop took place on September 26, 2014 in Venice, Italy.

About 20 participants attended the Workshop from all over the world. The audience feedback was positive. The research activities carried out within DOTSEVEN found a huge interest, in particular from companies and research institutes from Japan.