SEVENTH FRAMEWORK PROGRAMME
THEME FP7-ICT-2007-2
Information and Communication Technologies

Project # 224197 – TUMESA

MEMS Tuneable Metamaterials for Smart Wireless Applications

Deliverable 5.3

Special meeting with potential end users

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Author: Juha Ala-Laurinaho, Dmitry Chicherin, Antti Räisänen

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Abstract:

Present deliverable consists of a description of the organised TUMESA end-user meeting/workshop for the potential end users.

Keyword list: TUMESA dissemination, end-user meeting

Executive Summary

Present deliverable consists of a description of TUMESA End-user Workshop organised during ESSCIRC/ESSDERC 2011 conference, which was held in Helsinki, Finland, in September 12-16, 2011. The end-user workshop was held on Wednesday, September 14, 2011, at 2-4 p.m. The results of the TUMESA project were presented and after the presentation there was discussion on the results. The discussions are briefly summarised.

Full description of deliverable content

Meetings with potential end users, manufacturers, experts and dissemination of the project results are one of the primary goals of Work Package 5. In this context a special end-user meeting was organised in the form a workshop in order to disseminate the results of the TUMESA project for potential end-users. The workshop was organised within the ESSCIRC/ESSDERC 2011 conference. The conference was held in Helsinki, Finland, on September 12-16, 2011, and it collects major industrial and academic parties of the European solid-state devices and circuits technology sector. TUMESA End-user Workshop took place during the conference on September 14. In addition to the conference attendees, representatives from Finnish industry and research organisations were invited to participate in the workshop.

The workshop was started with the presentation of the TUMESA project results and after the presentation there were discussion on the results. TUMESA project presentation was held by the former Project Manager Dmitri Chicherin.

1. Participants of the workshop

Jyri Putkonen, Nokia-Siemens Networks
Juha Nurmiharju, Vesatel
Antti Räisänen, Aalto University
Dmitri Chicherin, Aalto University
Juha Ala-Laurinaho, Aalto University

2. TUMESA project presentation

The presentation was held by the former TUMESA Project Manager Dmitri Chicherin. The outline of the presentation is below:

- Motivation
- Project objective
- Project concept
- MEMS tuneable metamaterials
  - High-impedance surface: Design, Applications, Fabrication, Measurements
  - Loaded microstrip line for LWA
  - Other devices under development
- Submitted deliverables
- Future plans
- Conclusion

3. Discussion during the workshop

After the project presentation, there was a discussion about the results and topics of the discussion are briefly described below.

There was discussion on the required phase shift resolution of the phase shifters in order to produce beam steering. It was also discussed how well the high-impedance surface can be transferred to the mass production. There is need for technology transfer from the prototype fabrication to the mass production and, and further development of the fabrication process in companies is still required.

There was also discussion whether MEMS switches were studied during the TUMESA project. The design of the high-impedance surface is close to the MEMS switch structure, where e.g. effective length of the transmission line can be changed.

It was discussion on the potential application of the developed technologies within TUMESA as the TUMESA project is mainly devoted to the automotive radar antenna development. It was noted that the beam steering is also applicable in many communication application. It was also noted that automotive industry gives a good reference for the device operating environment also for the wireless communication devices which are intended to use in outdoor conditions.

There was discussion how fast are the MEMS varactors of the high-impedance surface. It was noted that the switching time could be about 10 microseconds.

In the current HIS-surface design, there is a column wise control of the impedances. It was noted that buried lines could be used for element wise control or control of small areas (of the order of the half of the wavelength.

4. Discussion and conclusions

The aim of the organised end-user meeting / workshop was to gather as wide audience as possible. That is why the meeting was organised during the ESSCIRC/ESSDERC 2011 conference. Although, the end-user meeting had the official conference workshop status and the meeting was also announced in the twitter channel of the conference website, there were no conference attendees participating the meeting. An invitation to the meeting was also e-mailed to over thirty representatives of Finnish industry, defence forces, or research organisations, and the attendees got the information about the meeting from the invitation. In future more focused end-user meetings are preferable and more personal invitations are required.

In addition to the end-user meeting, the TUMESA project results are presented in several conferences and workshops. These dissemination activities are presented and discussed in the final report and the report on dissemination activities.

Appendix 1, ESSDERC 2011 conference home page

http://www.essderc2011.org/

ESSDERC menu

- Call for papers
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41st European Solid-State Device Research Conference (ESSDERC)

The 41st European Solid-State Device Research Conference (ESSDERC) and the 37th European Solid-State Circuits Conference (ESSCIRC) will be held in Helsinki, Finland, on 12 - 16 September 2011. The aim of the ESSDERC and the ESSCIRC conferences is to provide an annual European forum for the presentation and discussion of recent advances in solid-state devices and circuits.

ESSDERC and its sister conference ESSCIRC are governed by a single Steering Committee. The increasing level of integration for system-on-chip design made available by advances in silicon technology is stimulating more than ever before the need for deeper interaction among technologists, device experts, and circuit and system designers. While keeping separate Technical Program Committees, ESSDERC and ESSCIRC will share Plenary Keynote Presentations and Joint Sessions bridging both communities. Attendees registered for either conference are encouraged to attend any of the scheduled parallel sessions.

Here are tweets mentioning our hashtags #esscirc or #essderc. Feel free to contribute in twitter!

#ESSCIRC/#ESSDERC 2011

ESSCIRC2011 RT @ChipworksGary: Energy Harvesting come of age. Notes from the tutorial at #ESSDIRC / #ESSCIRC 2011 last week. http://t.co/VvA6Lshg
yesterday · reply · retweet · favorite

ESSDERC2011 RT @adtechfeed: www.imec.be/esscirc

twitter Join the conversation

Conference image gallery

Conference Opening on Tuesday, at 8:30 in Congress Hall A.

The areas of interest for contributions to be submitted to ESSCIRC / ESSDERC 2011 include, but are not limited to:

ESSDERC
- Advanced CMOS Devices
- Process & Integration
- Power, High Frequency, and Optoelectronics
- Semiconductor Devices
- Modeling and Simulation
- Characterization, Reliability and Yield
- Memories
- MEMS, Displays and SoCs
- Emerging non-CMOS Devices and Technologies

ESSCIRC
- Analogue Circuits
- Data Converters
- RF and mm Wave
- Wireless and Wireline Communication Circuits and Systems
- Sensors, Imagers and MEMs
- Digital Circuits
- Processors, Memories, High Speed Interfaces
- Bio-Medical and Bio-Electronic Circuits
- Circuit & Systems in Emerging Technologies
- Power Management and Energy Scavenging

In addition to contributed papers and plenary lectures, the event will include tutorials, exhibits and satellite workshops to be organized before and after the main conference. An attractive social program will accompany the event, featuring a welcome reception, a gala dinner with awards ceremony, and excursions. Authors are encouraged to submit their contributions by following the guidelines which will be made available on this website later.

Early registration deadline 15 June 2011

Hannu Tenhunen, TUCS
Markku Åberg, VTT
Conference Chairs

Kari Halonen, Aalto University
Atila Alvandpour, LIU
TPC Chairs ESSCIRC

Mikael Östling, KTH
B. Gunnar Malm, KTH
TPC Chairs ESSDERC

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Appendix 2, ESSDERC 2011 workshops webpage

http://www.essderc2011.org/workshops.php

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Workshops

Monday 12 Sept

- Wireless Body Area Networks (WBAN) and EU project WiserBAN, Monday 12 Sept, half-day, (PM)
- European Workshop on MEMS Frequency References, half-day, (AM)

Wednesday 14 Sept

- End-user Workshop: TUMESA - MEMS Tuneable Metamaterials for Smart Wireless Applications, half-day (PM)

Thursday 15 Sept

- Guardian Angels, Thursday 15 Sept, half-day (PM)

Friday 16 Sept

- Guardian Angels Workshop, Friday 16 Sept, full day
  (with a common session with the Nanofunction Workshop on Friday morning)
- MOS-AK, Friday 16 Sept, full-day
- SINANO/NANOFUNCTION, Friday 16 Sept, full-day
  (with a common session with the GA Workshop on Friday morning)
- ELITE,Friday 16 Sept, full-day
- Euro-DOTS, Friday, 16 Sept, half-day (AM)

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Appendix 3, TUMESA End-user Workshop webpage

http://www.essderc2011.org/workshop_tumesa.php

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End-user Workshop: TUMESA - MEMS Tuneable Metamaterials for Smart Wireless Applications

Wednesday, September 14, 2011, 14-16

Organizers

Antti Räisänen, Aalto University
Juha Ala-Laurinaho, Aalto University
Dmitry Chicherin, Aalto University

Abstract

This Workshop is supported by TUMESA - MEMS Tuneable Metamaterials for Smart Wireless Applications funded by the 7th Framework Programme (FP7) by the European Commission (http://radio.tkk.fi/tumesa). The objective of TUMESA is to develop components and sub-systems based on microelectromechanical systems (MEMS) in order to provide a cost-efficient and high-performance technology platform for millimetre-wave automotive and industrial radar, and future high-capacity communication systems. In more details, the main objectives are: to develop novel on-chip phase shifting and beam-steering devices based on MEMS tuneable high-impedance surfaces; to integrate developed phase shifting components in novel space-efficient antenna arrays on a single chip; to elaborate novel concepts of implementation of the beam-steering devices and antenna arrays in cost-efficient radar sensor and future high-capacity wireless communication systems and evaluate fabricated prototypes at a system level. Partners of TUMESA are: Aalto University, Finland, Coordinator of the Project; KTH - Royal Institute of Technology, Sweden; UR1 - University of Rennes I, France; Autocruise S.A, France; and MicroComp Nordic, Sweden.
In this workshop, the results of the three-year project are presented for potential end-users. After the presentation there is time for discussions.

Program

Wednesday, September 14, 2011
13:00-14:00 Lunch
14:00-15:00 Presentation of the TUMESA results, Dmitri Chicherin Aalto University
15:00-16:00 Discussion on the project results
16:00-16:30 Coffee

Register to the workshop (with or without congress registration) here.

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