

LAAS Laboratoire d'Analyse et d'Architecture des Systèmes

INSTITUT CARNOU LAAS

MEMS Based Millimeterwave Imaging System

Dr. Alexandru Takacs

November, 30, 2011

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Project Short Title/Acronym: MEMIS	
Project Full Title: MEMS Based Millimeterwave Imaging System	
Topics: Photonics and electronics (optical devices, MEMS and NEMS, sensors)	
Total Project Costs: 935800 EUR	Requested Funding: 732000 EUR
Duration of the Project: 36 months	Start (MM/YY): 01/10
	Expected End (MM/YY): 12/12

Project history:

- May 2009: first step proposal
- July 2009: second step (final) proposal

Team involved into submission:

- Robert Plana, Fabio Coccetti, Alexandru Takacs (LAAS)
- Mircea Dragoman, Dan Neculoiu, Alexandru Muller (IMT)
- Tauno Vähä-Heikkilä, Arttu Luukanen (VTT)
- Laurent Rabbia, Vincent Perrut (31 Degrees)

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Consortium:

Organisation	Activity type	Contact Person (Name & email)	Country/Region	Applying for funding from: (insert Funding Agency)
[Coordinator]* LAAS-CNRS	RES	Robert Plana plana@laas.fr	France	Région Midi Pyrénées
[Partner 2]* IMT	RES	Alexandru Muller, alexandru.muller@imt.ro	Romania	CNMP
[Partner 3]* VTT	RES	Tauno Vähä-Heikkilä	Finland	TEKES
[Partner 4]* 31Degrees	SME	Laurent RABBIA laurent.rabbia@31deg.com	France / Midi Pyrénées	Région Midi Pyrénées

Consortium history:

- bilateral collaboration between LAAS & IMT started in 2000 and continued from 2004 in the frame of AMICOM network of excellence
- collaboration LAAS – VTT started in 2004 in the frame of AMICOM network of excellence
- collaboration LAAS-31Degrees (from the starting of 31Degrees)

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MEMIS technical Issues

MM-wave imaging sensor



↓ Circuit integration ↓

MM-wave imaging system

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**MEMIS technical Issues :
main achievements 2010-2011**


- Mm-wave imaging system design specifications: VTT+IMT+LAAS
- Design of Mm-wave passive sensor (without LNA): IMT+LAAS
- Design of Mm-wave active sensor (with LNA): IMT+LAAS (60 GHz & 94 GHz)
- Design and fabrication of 60 GHz band LNA : LAAS
- Design of innovative SIW antenna, fully compatible with silicon technology, for 94-GHz MM-wave imaging application: LAAS
- Roadmap for technological transfer : LAAS+31 Degrees



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**MEMIS technical Issues :
Ongoing activities : 2011-2012**

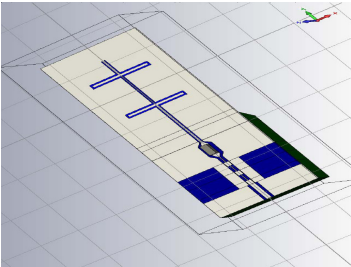
- Mm-wave sensors manufacturing : LAAS
- Mm-wave sensors characterization (without LNA): LAAS+ IMT + VTT
- Design, Integration and fabrication of Mm-wave sensor using VTT technology : VTT +LAAS+ IMT
- SIW-like antenna optimization & integration with Mm-wave sensors
- Manufacturing of mm-wave sensor with SIW-like antenna
- Technological transfer : 31 Degrees + LAAS


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MM-wave passive sensor (2011)

- IMT design
- It will be manufactured at LAAS

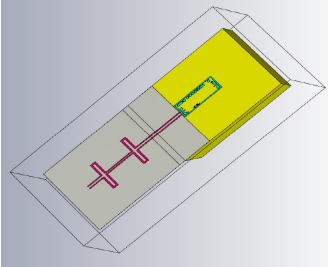



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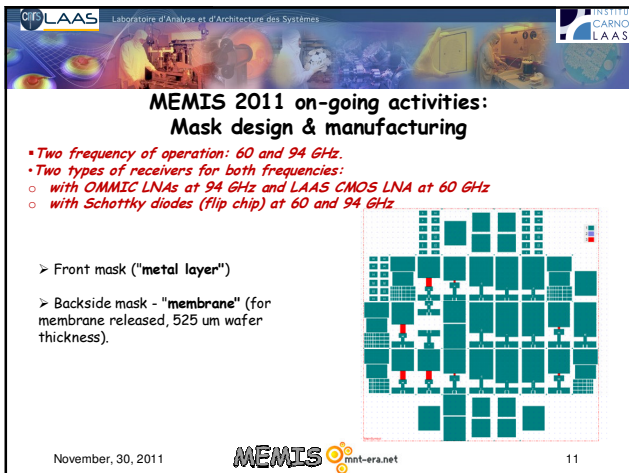
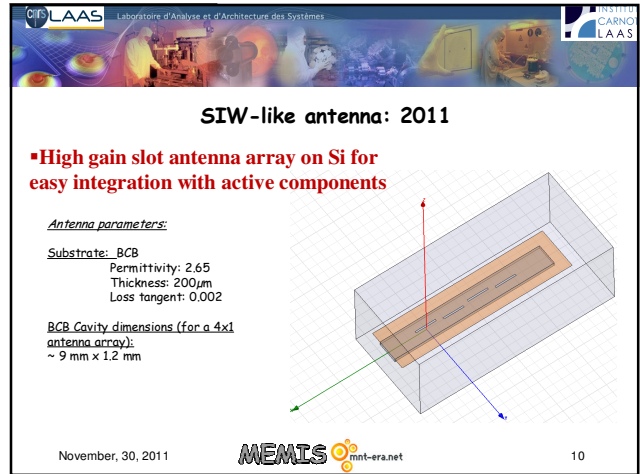
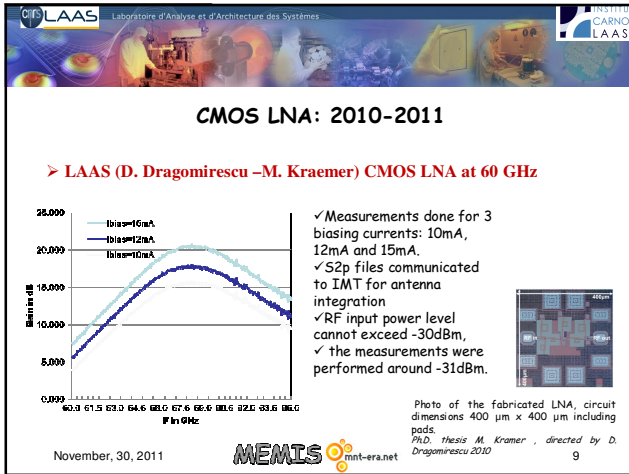



MM-wave active sensor (2011)

- IMT design
- It will be manufactured at LAAS



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Conclusion & Perspective

Items	Details	Status	Responsible
Sensor design	Passive & active for 60 GHz & 94 GHz band	Done	IMT
Diodes	M/A Com & Metelics	Available at LAAS	LAAS
LNA	60 GHz CMOS (LAAS) 94 GHz (Ohmmic)	Available at LAAS	LAAS
Manufacturing	LAAS (membrane) VTT	On going	LAAS VTT
Characterization	Setup to be defined	To be performed	LAAS+IMT+VTT
Technological transfer	Based on 31 Degrees experience	Roadmap established	31 Degrees

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