

Laboratory of Micromachined Microwave Circuits

Financed by the National Programme "MATNANTECH" (2002-2005) as a Centre of Excellence in RF MEMS
 Head of the laboratory/centre: Dr. Alexandru Muller. Member of the NEXUS User Supplier Club for Communications

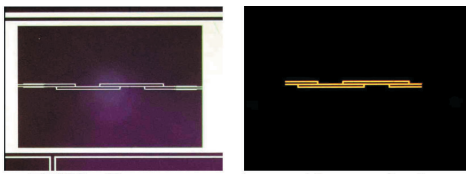
Mission:

- research and development of new structures, technologies and materials for Micromachined Microwave and Millimetre Wave Devices and Circuits;
- international recognized expertise in RF MEMS (coordinating the European project MEMSWAVE - nominated for the Descartes Prize 2002, Joint lab with Samsung Advanced Institute of Technology)



Dr. Yves Michot, President of the Descartes Prize Grand Jury and Dr. Alexandru Muller, MEMSWAVE Project co-ordinator - IMT Bucharest

Expertise in:



77GHz filter structure (top and bottom view)

- Design, modelling and manufacturing of dielectric membrane supported inductors, capacitors, filters and antennae based on

silicon micromachined technology

- Design, modelling and manufacturing of GaAs membrane supported filters and antennae
- Design, modelling and manufacturing of micromachined millimetre and sub millimetre wave receiver modules based on silicon as well as on GaAs technology
- RF switches design and modelling
- Studies on non-linear microwave propagation in YIG thin film
- Modelling of quantum devices

Facilities:

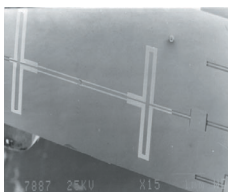
- Computers and software (IE3D and Fidelity from ZELAND software packages) for simulation and design
- Access to the technology laboratory and mask manufacturing facilities
- Access (by international cooperation) to millimetre wave on wafer measurements

Team members:

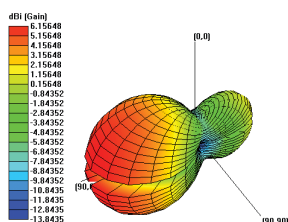
- Dr. A. Müller
- Dr. M. Dragoman
- Dr. G. Sajin
- Phys. I. Petrini
- Dr. C. Anton
- Eng. C. Buiculescu
- Phys. D. Vasilache
- Phys. A. Cismaru
- Eng. R. Enachescu
- Eng. F. Vladoianu
- Eng. I. Dragoin



35 GHz micromachined Yagi antenna structure



38 GHz micromachined GaAs based receiver structure



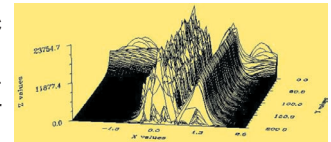
45 GHz Yagi antenna - 3D radiation pattern

Laboratory of Micro- Photonics

Financed by the National Programme "Relansin" (2001-2004) as a Centre of Excellence in Micro- and Nano-Photonics (in co-operation with Optoelectronics Research Centre from "Politehnica" Univ. Bucharest)
 Head of the laboratory/centre: Dr. Dana Mihaela Cristea

Mission:

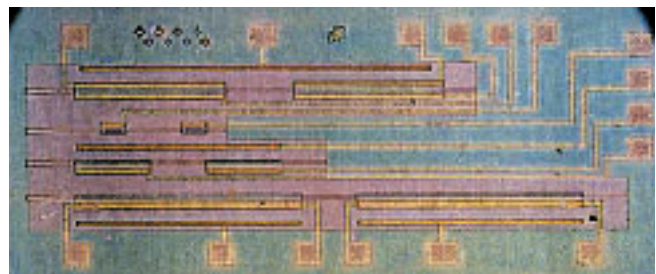
- Development of new materials, processes, micro- and nano-scale photonic structures
- Development of optoelectronic integrated circuits (OEIC)
- Development of materials, technologies and components for Optical MEMS



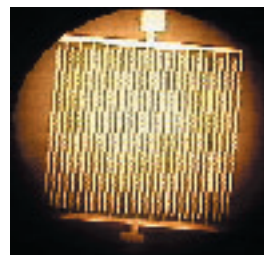
3D electric field distribution of the TE models

Expertise in:

- Advanced materials for micro and nano photonic structures (nano-crystalline Si, Si alloys, composite polymers)
- Modelling and simulation of micro and nano optoelectronic and photonic devices



Photonic integrated circuit composed of photodetectors coupled to wave guides



MSM photodetector based on poly-Si thin layers integrable with optical waveguides

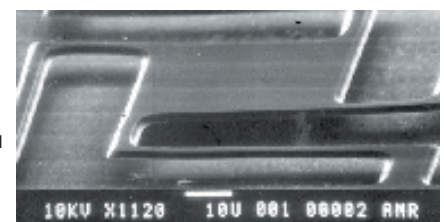
- Design, fabrication and characterisation of OEICs and optical MEMS for communications and chemo and bio sensors
- Sol-gel technology for photonic structures and sensors
- Si micromachining for optical MEMS

Facilities:

- Software: time-domain simulation software for advanced passive and active photonics components- OptiFDTD-cad, semiconductor heterostructure modelling software - HS_Design
- Access to the technological facilities: mask fabrication laboratory; clean room; wet/dry oxidation; diffusion; ion implantation; positive lithographic processes (thin and thick resists); APCVD and LPCVD for undoped and doped silica, SiON, SiC; plasma, chemical and electrochemical etching; thermal and sputtering deposition for metallic and dielectric films; sol-gel deposition; electro deposition
- Atomic Force Microscopy, SEM; Spectrophotometry; experimental set-up for optoelectric characterisation in UV-VIS-IR spectral range of optoelectronic circuits

Team members:

- Dr. Eng. Dana Cristea
- Dr. Eng. Raluca Muller
- Phys. Elena Budianu
- Dr. Munizer Purica
- Phys. Mihai Kusko
- Phys. Stefania Degeratu



SiO₂ diaphragms for Fabry-Perot interferometers