



**Project presentation :**

**NANOCOM: Reconfigurable Microsystem Based on Wide Band Gap Materials, Miniaturized and Nanostructured RF-MEMS**

**Consortium: Thales Research-TRT (France) –Coordinator, IMT Bucharest, Glonatech (Greece), SHT (Sweden), Forth(Greece), TOGAN (Poland), Univ. of Athens (Greece), CEA (France), Inst Electronique Fondamentale (France), Thales Aerospace-TSA(France), Uni. Chalmers (Sweden), Univ. Uppsala (Sweden)**

The project is focused on reconfigurable MEMS based on GaN and GaAs- a novelty at international level. The project has to fabricate and measure three demonstrators, which will be launched on the market in about 1 year after the project is finished. These demonstrators are

- a reflect array
- Agile radio in the bandwidths 1-3 GHz si 10 GHz for the managemnt of radars which monitor the air traffic.
- intelligent antennas based on RF MEMS

**Role of the Romanian partner (IMT Bucharest) in this project:**

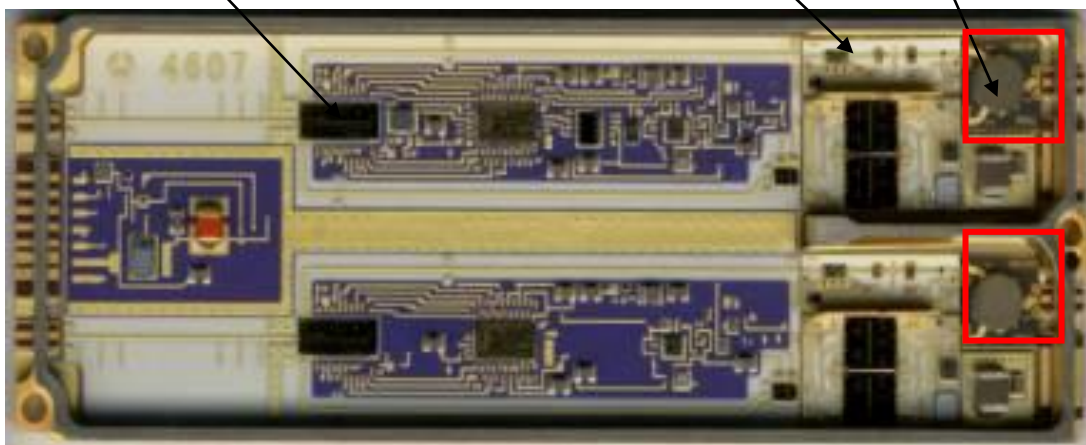
Leader of Work Package 4: Design, fabrication and test of GaN, LCP and Si based RF-MEMS circuits and LCP boards. Without these circuits no demonstrator could be fabricated.

Photo of a transmitter SoC.

**Core chip**

**Limitier-  
LNA**

**RF MEMS circuits to  
replace the circulator**



**Research infrastructure:** IMT uses the vector network analyzer facilities up to 110 GHz, and other microwave instrumentation available in the laboratory. The experimental facility IMT -

MINAFAB (“open centre” of IMT, providing services) is used for mask fabrication and characterization equipments such as SEM , XRD and the white light interferometer.

**Human resources implied in the projects :** IMT laboratory L4 which has 9 Ph.D. and other 3 young researchers.

**Impact of the results on Romanian scientific community and Romanian society.**

This is the first project in Romania where RF MEMS are fabricated on GaN and GaAs, i.e. RF MEMS are further integrated on microwave integrated circuits (MMIC). This is a big novelty since up to now the RF MEMS were only integrated in hybrid way. Now the RF MEMS are fully integrate with the rest of the circuitry forming a *system on chip* (SoC) one of the most advanced integration in nanoelectronics. The SoC has enhanced properties not encountered in simple circuits. All demonstrators are SoC. Romania society will direct benefit from this research. The management of air traffic is a huge problem at European level. These three SoCs demonstrators will make air traffic management safer and faster.

**The integration of Romanian team in international networks**

This project is a good example of integration in such a network. Thales is a worldwide company provider of radars for traffic control (including Romania). IMT common work with such big company means simply that our research is integrated at European level . Moreover, well known research institutes like FORTH are participating in the project with which IMT has a common lab via CNRS. Many important universities are also participating in the project. As a result of good results obtained by the IMT team in the project we were asked by Thales to participate in another project NANORF which is funded by FP7 ICT. Also, we are now developing microwave biosensors with Uppsala University to be integrated in a SoC.