



AMICOM toward FP7
Workshop on EU RF Microsystems Technology (RF-MST / RF-MEMS)
 9 October 2006 -NOVOTEL Centrum - Leuven, Belgium

The aim of the event was to gather R&D stakeholders on RF-MST/MEMS and related fields in order to discuss and promote joint activities in view of the forthcoming 7th Framework Program (FP7). The event has been quite successful with the participation of several experts including AMICOM members, external partners coming from academic research, industry and European Technology Platform alike (ENIAC and EpoSS).

Hereby follow the synthesis of the discussion, highlighting the stakeholder's demands and recommendations for the future research program. The presentation material is available on the AMICOM web (Detailed Information - AMICOM Event - AMICOM Toward FP7).

European Nanoelectronics Initiative Advisory Council (ENIAC) - Massimo. COMPARINI (Alcatel Alenia Space - Rome and member of ENIAC's Forum of Stakeholders). RF-MST/MEMS have an important role in ENIAC's strategic research agenda (SRA). In the organizational structure of ENIAC is foreseen the collaboration with research communities (such as AMICOM) which are encouraged to foster fundamental research.

European Technology Platform on Smart Systems Integration (EPoSS) - Georg. FISCHER (member of the working group for the definition of the EPoSS's SRA). Enormous effort are still necessary to bridge the gap between component and products. AMICOM could play an important role in this sense by dealing with multidisciplinary issues such as multiphysics modeling, material and multiple-technology processes.

ST-Microelectronics - Fabrice CASSET. ST-Microelectronic. AMICOM is an important resource of fundamental research (especially in the field of nanoscience).

Alcatel Alenia Space (AAS) - Olivier VENDIER. AAS main interest is in reliability (failure modes, accelerated life test, new standards and qualification methodology), industrialization of existing processes (IP transfer and need of European foundries), analysis and design tools (multiphysics, multiscale, and compatibility with existing ones), technology (new materials, cross compatibility between technology, NEMS for microwave). AAS suggests the following role for the funding instruments:

- ♦STREP as the only tool that respect the value chain. Because of the limited size and focused aim it enables the transfer from lab to industry. The STREP weight over the other instrument should be increased.
- ♦IP: should play a role on transversal issues, with respect to applications, by dealing with topics as reliability, innovative technologies.
- ♦NOE: should be transnational academic and industrial network and an EC tool for academic assessment, and focused services.

EADS - Christian SIEGEL. EADS wishes to see soon in the future a transfer of any RF-MEMS technology in an European semiconductor or MEMS foundry. The requirements for such a technology transfer are: reliable fabrication processes (if possible on large scale); set the MEMS based building blocks for circuit design; provide a wafer level packaging, and compatibility with standard assembly technologies (flip-chip, wire-bonding, soldering, ...).

NXP - PHILIPS - Peter STEENEKEN. NXP (former PHILIPS's RF-MST department). NXP is keen to participate into future EU funded projects. NXP's expectations are focused on an improved use of the resource and in the investigation of unexplored area in order to foster new technology (by shared use of research resources), new devices (design based on available process and components library, based on multiphysics model), and new applications (communication systems with ultra low size and power consumption).

Bell Labs Europe - Lucent - Georg FISCHER. Lucent Lab Europe sees with great interest to the outcome of EU projects on RF-MST/MEMS. Recently it has developed a very promising demonstrator for a reconfigurable software defined PA architecture (called ERGAN) realized with commercially available (Wispry and Magfusion) RF-MEMS components. Lucent Lab Europe has also suggested that RF-MEMS components could be used to tune metamaterial, and has encouraged AMICOM to evaluate a possible collaboration with the NoE HTUMetamorphoseUTH.

Coventor - Gerold SCHROPFER Software houses which focuses on the design and modeling of RF-MST devices systems and technology as Coventor look forward to collaboration in the area of multiphysics problem solution, and co-design approaches.

In conclusion the workshop has allowed us to spot and highlight some key requirements and key applications which still need to be tackled at EU level by synergic collaboration between industrial and academic, private and public organization alike:

Key requirements from the industrial stakeholders:

- ♦Fundamental research (modeling, materials, processes, testing,...)
- ♦Specialized services (foundry with stable processes, standardized characterization especially the reliability and failure modes, large scale and fast testing solutions, multiphysics modeling and analysis platform...)

Key Applications:

- ♦Frequency agile analog spectrum processing for: terminal (hand held equipment, communicating sensor nodes); base stations (mobile communications, wireless)
- ♦Radiation agile antennas (and reflectarray) for automotive and space applications
- ♦Novel enabling technology for "hybrid co-integration" (SiP) of RF-MST (including Methamaterials, NEMS,...)

General understanding:

Companies are optimistic about RF-MST/MEMS (EADS, Lucent Bel Lab Europe, AAS, ST-MICRO, PHILIPS, ESA...) and RF-MST/MEMS technology is recognized as an enabling technology for smart integrated microsystems. This is acknowledged also by the strategic research agenda (SRA) of the two major ETPs in the field of Micro and Nanosystems technology and smart systems integration such as ENIAC and EpOSS respectively. Both include RF-MST/MEMS in their R&D roadmaps. The representatives of these ETPs have expressed a clear interest to establish a bridge with AMICOM in future activities.

Only systems level integration of RF-MST/MEMS technology makes sense (not as a stand alone component). This requires a co-design approach at architecture level (find the best architecture and not simply do technology replacement on conventional ones) and at process level (the packaging solution should be conceived at the very beginning of the design flow along with the components/systems).

AMICOM has played the strategic role of gathering and bridging research expertises and specialized infrastructure traditionally far away each other. This has yielded a research community with a focused scope and a highly competent critical mass of expertise which should be maintained and supported in the future. The network commitment should be now addressed to services providing and specialized knowledge dissemination.

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