

5th ESA Micro & Nano Technologies Round Table

ESTEC, Noordwijk The
Netherlands

3-5 October 2005



Closing session

Nicolas Sailen ESA

&

Laurent Marchand ESA



5th ESA MNT Round Table Participation

- 1st Round Table in March 1995
- 2nd Round Table in October 1997
- 3rd Round Table in May 2000
- 4th Round Table in May 2003

5^h ESA MNT, 3-5 October 2005:

- 64 Presentations
- 18 countries participating (Netherlands, Switzerland, France, Denmark, Ireland, Italy, Spain, Germany, UK, Canada, China, USA, Belgium, Sweden, Greece, Norway, Finland, Austria)
- 3 complete days, 12 sessions, 26 hours and 40 mn
- ~ 200 Participants

Proceedings

- *Paper deadline: 31th October 2005*
- *CD-ROM distribution Mid November 2005*

***5th ESA MNT Round Table
3-5 October 2005, ESTEC***

5th ESA MNT Round Table

Objectives and achievements 1/5

➤ Summarize on the **achievements** since the 4th ESA MNT Round Table:

✓ Significant advanced has been reported in many domains:

- RF MEMS technology appears to improve
- RF MEMS switches are now being integrated at sub-system level (antenna)
- Various MOEMS are commercially available and can be used for space (Delta) qualification testing
- Micro-propulsion systems are now considered for Flight Opportunity
- The number of flight opportunities is significantly increasing (SSTL, Launchers, National Initiatives Sweden, NL...)

5th ESA MNT Round Table

Objectives and achievements 2/5

- Present the **activities** started since 2003 in this domain
- ✓ Approximately 17 papers reported on ESA activities that have been started between 2003 and 2005:
 - MOEMs Delta Qualification (Alenia Alcatel Space, Sercalo, LAM , MEMSCAP, IMEC)
 - ENDORFINS (IMEC, Alenia Alcatel Space)
 - Non Hermetic RF MEMS (IRCOM, Alenia Alcatel Space)
 - MEMS Pressure Sensor Pre-Qualification (Presens)
 - ARTES RF MEMS (Microsaic)
 - SAT'N LIGHT (Sercalo, AAS, Neufchatel, Contraves)
 - Nano Satellite Beacons for Space Weather Monitoring (RAL, EADS Astrium, SISP)

5th ESA MNT Round Table

Objectives and achievements 3/5

- Encourage and trigger effective **cooperation** between **industry** (final user) and **universities / research centers** (prototyping & development) and facilitate **technology transfer**
- ✓ Only short breaks were available but contacts could take place between universities and mission concept deciders, between technology providers and final users
- ✓ Examples of technology transfers were presented:
 - IRCOM → RMT
 - ASTC → SSTL
 - etc

5th ESA MNT Round Table

Objectives and achievements 4/5

- Encourage and trigger effective **cooperation** between **industry** (final user) and **universities / research centers** (prototyping & development) and facilitate **technology transfer**
- ✓ Only short breaks were available but contacts could take place between universities and mission concept deciders, between technology providers and final users
- ✓ Examples of technology transfers were presented:
 - IRCOM → RMT
 - ASTC → SSTL
 - etc

5th ESA MNT Round Table

Objectives and achievements 5/5

➤ Present initial data gathered by ESA and NSAs on MST failure mechanisms, **reliability** and lifetime, start collaborative work on **space qualification**

✓ Approximately 10 papers reported on ESA or national (i.e. CNES) activities on reliability and MEMS qualification. However it is clear that standardization and documentation (specification) issues still require additional efforts and cooperation

➤ Discuss on ESA possible Role and involvement in the **Nano Technology** domain

Inform the space community on **ESA initiatives** in support of MNTs (<http://emits.esa.int/>, D-TEC Nanotechnology WG, CTB MNT WG,...)

*5th ESA MNT Round Table
3-5 October 2005, ESTEC*

5th ESA MNT Round Table

Expected outcome

- Consolidated **Roadmaps** for supplier and final users
- Updated **TRL Data** on existing MNT systems
- Suggestion on required **future investments**
- **Inputs** for the coming TEC-NET and NEW-PRO programmes and MNT developments
- Identification of new **ESA GSTP** opportunities

5th ESA MNT Round Table Technology Development Project phasing relationship



5th ESA MNT Round Table
3-5 October 2005, ESTEC

5th ESA MNT Round Table

Questions ??

Suggestions??

6th ESA MNT Round Table

We hope to see you back in **2007!!**

With flight data!!

Acknowledgement:

- ✓ The participants
- ✓ The speakers
- ✓ The chairmen
- ✓ The ESA conference bureau
- ✓ **Nicolas Sailen** for his support