



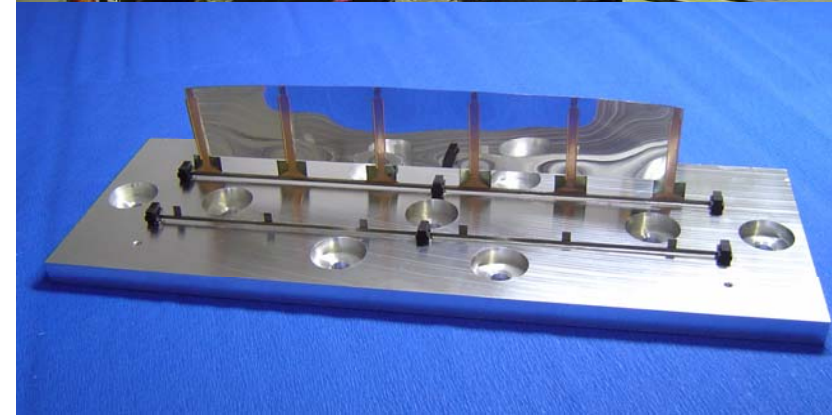
Presentation of
Space Technology Division
ARTES 11 main activities

date: 30.06.2006

New strategic fields of the Space Technology division

Thermal Louvres (MEMS)

- ▶ Thermal Louvres for ROSETTA mission
- ▶ Micro electrical / mechanical thermal thermal louvres ARTES- 5
- ▶ Qualification of micro mechanical / electrical thermal louvres for future Telecom Satellites



MEM LOUVRES FOR THERMAL RADIATORS

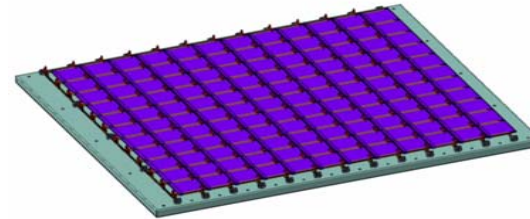
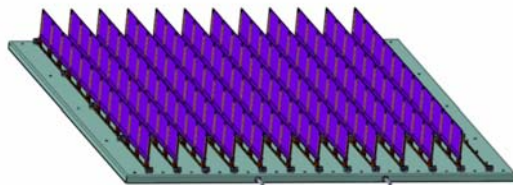
Objective of the project:

- Development of a micro-engineered device based on MEM technology able to change the heat rejection capability of a radiator and to protect it against external radiation variations
- Verification of the performance via analyses and tests

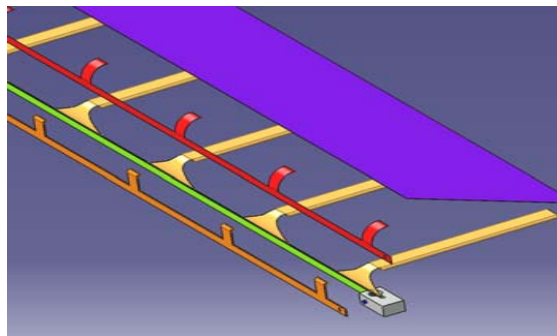


MEM LOUVRES FOR THERMAL RADIATORS

Design:



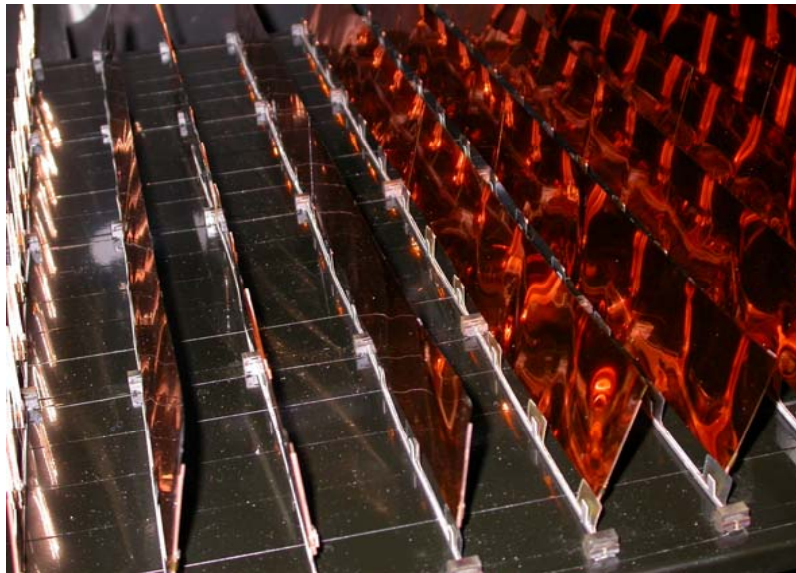
- The closing and opening of the louvres wings is performed with SMA (shape memory alloy) actuators controlled by solar radiation



MEM LOUVRES FOR THERMAL RADIATORS

Manufacturing:

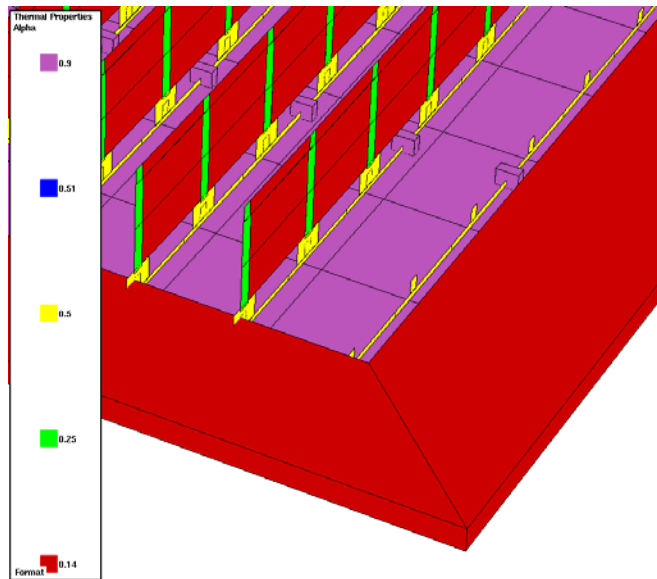
By means of thermo-optical treatment the memory material will be formed and learned to operate in the required temperature range



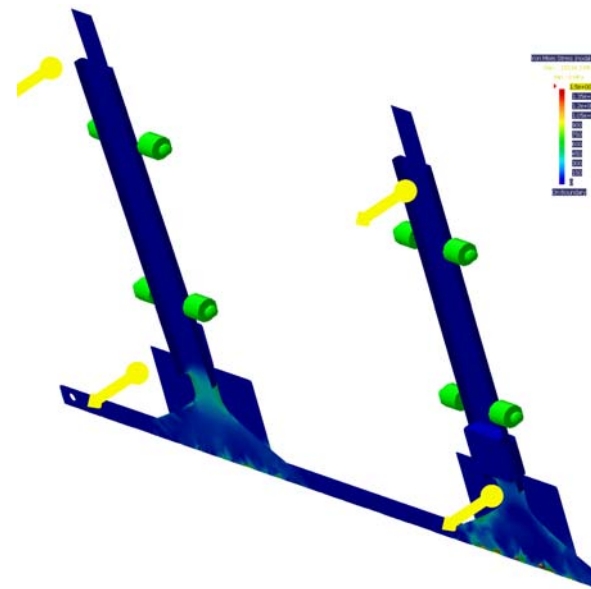
**MEM Louvres
Breadboard Model**

MEM LOUVRES FOR THERMAL RADIATORS

Verification by analyses:



Thermal analyses



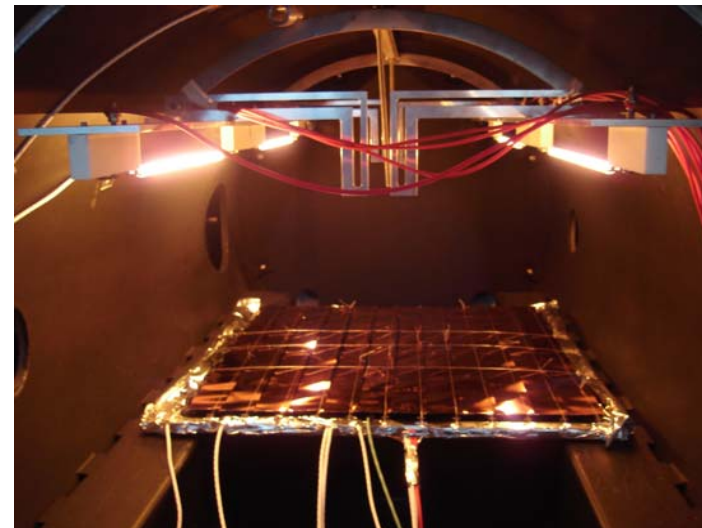
Mechanical analyses

MEM LOUVRES FOR THERMAL RADIATORS

Verification by tests:



Heat Rejection Test



Heat Leak Test
with sun simulated radiation

MEM LOUVRES FOR THERMAL RADIATORS

Features of MEM Louvres (verified by tests):

- **dimension: 530 x 490 mm (radiating area)**
- **mass: 498 g/m²**
- **heat rejection capability: 86,5%**
- **heat leak: 23,9 W/m² (tbc - test correlation in process)**

