



## **Status of development of the three axes sensitive accelerometer MicroSTAR**

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The accelerometer MicroSTAR is a three axes sensitive accelerometer. Its configuration with a cubic proof-mass is interesting for future gravity mission as it provides the same performance along the three axis but also angular acceleration for attitude control or recovery. The proof-mass is surrounded by three pairs of identical electrode plates in Ultra Low Expansion material (ULE), each pair controlling two degrees of freedom. The accelerometer electronic architecture is composed of six control loops, one for each degree of freedom of the proof-mass. Along each of the three axes, one translation and one rotation are controlled by similar schemes. The performance of the MicroSTAR accelerometer can be adapted with respect to each mission and spacecraft, as the acceleration is dependent of the trajectory and of the mass and surface of the spacecraft. The range and the noise of the instrument are adjusted during the definition by tuning the size of the proof-mass in order to modify the gap between proof-mass and electrodes.

A reduced prototype of MicroSTAR, with a cubic proof-mass of 20x20x20mm in ULE, was built in order to verify the concept and optimize the accelerometer control loop. The gap between proof-mass and electrode is adapted to allow ground levitation along one direction. The front-end electronic unit is implemented around the mechanical sensor. The status of development and test of this first prototype is presented.