

MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)  
Gravity and Fundamental Physics (1)

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## STATUS OF THE FLIGHT PAYLOAD OF THE MICROSCOPE SPACE MISSION

**Abstract**

The MICROSCOPE space mission aims at testing the Equivalence Principle (EP) with an accuracy of  $10^{-15}$ . This principle is one of the bases of the General relativity theory; it states the equivalence between gravitational and inertial mass. The test is based on the precise measurement of a gravitational signal by a differential electrostatic accelerometer which includes two cylindrical test masses made of different materials. The accelerometers constitute the payload accommodated is on board a drag-free micro satellite which is controlled inertial or rotating about the normal to the orbital plane with a very stable angular velocity. The acceleration estimates used for the EP test are disturbed by the instrument's physical parameters and by the instrument environment conditions on board the satellite. A lot of these parameters are measured with ground tests of the electronics units or during the integration mechanics or of the full instrument into the satellite. Nevertheless, in spite of a very detailed error budget, these ground evaluations are not sufficient with respect to the EP test accuracy objectives and in-orbit calibration is mandatory to complete their fine characterization. After a general description of the MICROSCOPE space mission and the instrument, the paper will present the status of the flight-model payload, the results of its environmental tests and the lessons learned from the drop tower catapult test where "what you see is what you will see in orbit".