

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

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IN ORBIT CALIBRATION FOR THE INSTRUMENT OF THE MICROSCOPE SPACE MISSION

Abstract

The space mission MICROSCOPE aims at testing the Equivalence Principle (EP) with an accuracy of 10^{-15} . 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 accelerometer is onboard a drag-free microsatellite which is controlled Earth pointing or rotating about the normal to the orbital plane with a very stable angular velocity. The acceleration measurements exploited in the EP test depend on the instrument's physical parameters disturbed by the environment of the instrument on board the satellite. These parameters are partially measured or estimated with ground tests or during the integration of the instrument on the satellite. Nevertheless, these evaluations are not sufficient with respect to the EP test accuracy objectives. An in-orbit calibration is therefore needed to characterize them finely and to correct the measurements. After a review of the status of progress of the MICROSCOPE payload, presently in qualification phase, the presentation will describe the specific procedures which are planned to determine in orbit the exact values of the instrument's defects. The results of the theoretical evaluation of the calibration process will be provided.