

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

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MODELLING AND SIMULATION OF THE SPACE MISSION MICROSCOPE

Abstract

MICROSCOPE is a French space mission for testing the Equivalence Principle (EP). The mission goal is the determination of the Eötvös parameter η with an accuracy of 10^{-15} . The french space agency CNES is responsible for the satellite which is developed and produced within the Myriade series. The satellite's payload T-SAGE (Twin Space Accelerometer for Gravitation Experimentation) is developed and built by the french institute ONERA. It consists of two high-precision capacitive differential accelerometers. One accelerometer is used as reference sensor with two test masses of platinum, the science sensor contains a platinum and a titanium proof mass. The detection of the test mass movement and their control is done via a complex electrode system.

As a member of the MICROSCOPE performance team, the German department ZARM performs free fall tests of the MICROSCOPE differential accelerometers at the Bremen drop tower. Besides mission simulations and the preparation of the mission data evaluation in close cooperation with the French partners CNES, ONERA and OCA are realised. Therefore a comprehensive simulation of the real system including the science signal and all error sources is built for the development and testing of data reduction and data analysis algorithms to extract the EP violation signal. In this context the focus lays on the correct modelling of the environmental disturbances. Currently new effort to study the influence of the solar radiation and the Earth albedo to the MICROSCOPE mission scenario is underway. The actual status of the mission modelling will be presented.