MICROGRAVITY SCIENCES AND PROCESSES (A2)
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SIMULATION APPROACHES FOR THE SPACE MISSION MICROSCOPE

Abstract

The data analysis of space missions rely on the correct understanding of the satellite and its payloads dynamics that are influenced by various kinds of disturbances resulting from the interaction with the space environment. Besides systematic errors like sensor noise have to be considered, too. Thus it is crucial to perform simulations that represent the complex mission scenario in order to develop and test data analysis methods and algorithms. For this purpose the High Performance Satellite Dynamics Simulator (HPS) is being developed by the Center of Applied Space Technology and Microgravity (ZARM) in cooperation with the DLR Institute of Space Systems. This tool provides the possibility to simulate the dynamics of a satellite and up to four differential accelerometers including a number of options that affect the calculation process.

The characteristics of the HPS match perfectly the requirements for the simulation of the French space project MICROSCOPE. The goal of this mission is the determination of the Eötvös parameter with an accuracy of 1e-15. For this purpose two high-precision differential capacitive accelerometers will be used, that are built by the French institute ONERA. At ZARM drop tower tests are carried out to verify the payload performance. In addition the mission data evaluation is prepared in close cooperation with the French partners CNES, ONERA and OCA whereas at ZARM the HPS is applied for this purpose. The status of the ongoing simulations will be presented.