

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

Author: Mrs. Françoise Liorzou

Office National d'Etudes et de Recherches Aérospatiales (ONERA), France, francoise.liorzou@onera.fr

Dr. Phuong-Anh Huynh

Office National d'Etudes et de Recherches Aérospatiales (ONERA), France, phuong-anh.huynh@onera.fr

Mr. Damien Boulanger

Office National d'Etudes et de Recherches Aérospatiales (ONERA), France, damien.boulanger@onera.fr

Dr. Bruno Christophe

Office National d'Etudes et de Recherches Aérospatiales (ONERA), France, bruno.christophe@onera.fr

Dr. Bernard Foulon

Office National d'Etudes et de Recherches Aérospatiales (ONERA), France, bernard.foulon@onera.fr

STATUS OF GAP: AN ELECTROSTATIC ACCELEROMETER FOR INTERPLANETARY
FUNDAMENTAL PHYSICS**Abstract**

The Gravity Advanced Package is an instrument composed of an electro-static accelerometer called MicroSTAR and a rotating platform called Bias Rejection System. It aims at measuring with no bias the non-gravitational acceleration of a spacecraft. It is envisioned to be embarked on an interplanetary spacecraft as a tool to test the laws of gravitation at long distance. MicroSTAR is based on Onera's experience and inherits in orbit technology from CHAMP, GRACE and GOCE missions. The addition of the rotating platform is a technological upgrade which allows using an electrostatic accelerometer to make measurements at low frequencies with no bias. To do so, the Bias Rejection System rotates MicroSTAR such that the signal of interest is separated from the bias of the instrument in the frequency domain. With improvements to reduce power consumption, size and mass in view to fit with interplanetary probe requirement, MicroSTAR is a 3-axis micro accelerometer able to reach a resolution of 1 picometer per second squared integrated along 5 hours trajectory segment. The status of the instrument development will be presented detailing the verification of the most critical aspects concerning the operation and the performance.