

66th International Astronautical Congress 2015

SYMPOSIUM ON TECHNOLOGICAL REQUIREMENTS FOR FUTURE SPACE ASTRONOMY AND  
SOLAR-SYSTEM SCIENCE MISSIONS (A7)

Scientific Motivation and Requirements for Future Space Astronomy and Solar System Science Missions (2)

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A DEDICATED EARTH-ORBITING SPACECRAFT FOR INVESTIGATING FUNDAMENTAL  
PHYSICS AND THE SPACE ENVIRONMENT

**Abstract**

A dedicated mission in low Earth orbit is proposed to test the gravitational interaction and place improved limits on the atmospheric density in the altitude range of 500-1200 km. The core of the mission would be a very simple spacecraft placed in a polar eccentric orbit and tracked with high precision; an on-board accelerometer would measure the non-gravitational accelerations acting on it. The precise orbit determination is expected to provide a verification of general relativistic predictions and estimates of geophysical parameters, while the accelerometer data would be fundamental in constraining the atmospheric density. Along with the scientific objectives, a basic mission configuration will be described and discussed, highlighting the main issues to be explored.