

SPACE OPERATIONS SYMPOSIUM (B6)

New Operations Concepts, Advanced Systems and Commercial Space Operations (2)

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OPERATIONS AND DATA ANALYSIS FOR THE LARES MISSION

Abstract

LASer RELativity Satellite (LARES) has been successfully launched on the 13th of February 2012 with the VEGA maiden flight. Its main objective is to test an aspect predicted in Einstein General Relativity known as the Lense-Thirring effect or the dragging of inertial frames: the Earth rotation by deforming spacetime will drag the orbital plane of LARES by a tiny but measurable amount. The International Laser Ranging Service is providing the ground tracking of the satellite by measuring mm-accurate ranges using the time-of-flight of ultra-short laser pulses. Due to the presence of additional, well-understood periodical perturbations, it is necessary to analyze several years of data before an accurate test of Lense-Thirring effect can be performed. Furthermore to eliminate some huge effects of classical gravitational perturbations on the orbital node of LARES, the data must be analyzed together with those from LAGEOS and LAGEOS 2 satellites, provided also that an accurate determination of the gravitational field of Earth is utilized in the orbital determination process. In this paper we will describe the physics underlying the experiment, the ground tracking and analysis operations, and all of the activities performed to acquire and reduce the tracking data of the satellite.