

SMALL SATELLITE MISSIONS SYMPOSIUM (B4)
Small Space Science Missions (2)

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SCIENTIFIC AND ENGINEERISTIC ASPECTS OF LARES MISSION

Abstract

LARES was first presented as a response to a call for proposal issued by ASI in 1997. It is an evolution of the LAGEOS 3 proposal (1986). In February 2008 ASI signed a contract with Carlo Gavazzi Space to build the LARES system to be launched with the VEGA maiden flight in December 2009. Altitude at 6000 km with an inclination of 70 degrees (supplementary to LAGEOS I satellite) was the original proposal. With this orbit, the contribution of all the even zonal harmonics of the Earth gravitational field to the node motion of the orbit of the satellite would have cancel out, providing a direct measurement of the Relativistic Lense-Thirring effect (if all the other perturbations are well modelled). The availability of the VEGA maiden flight was an opportunity to use an alternative approach. In fact, even if VEGA would have the capability to reach a 6000 km orbit with a lower payload weight, the flight envelope for qualification reaches only 1500 km. Now considering that the major source of error, in the experiment, is given by the first two even zonal harmonics it is possible to combine the orbital motion of three laser ranged satellites to eliminate the uncertainties induced by those two harmonics. The foreseen orbit is now 1450 km altitude with an inclination of about 71 degrees and the three satellites are the two LAGEOS and LARES. In the paper it will be described the status of the program with some details on both scientific objectives and engineering aspects: ground segment, launch system and space segment (LARES system).