Relativistic effects and Space Geodesy with Laser Ranged Satellites: the LARASE research program

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LARASE (LAser RAnged Satellites Experiment) aims to provide refined measurements of Einstein's theory of General Relativity by means of the very precise measurements of the Satellite Laser Ranging technique.

In this regard, a big effort of LARASE is devoted to improve the dynamical model of the two LAGEOS satellites and of the new satellite LARES. The target is to obtain a more precise and accurate determination of their orbit. Indeed, the systematic error sources due to both the gravitational and non-gravitational perturbations may corrupt the relativistic measurements.

At the same time, it is indisputable that a more accurate and precise orbit determination (POD) of the satellites, based on a more reliable dynamical model, represents a fundamental precondition to eventually reach a sub-mm precision in the SLR range residuals and, consequently, to gather benefits in the fields of space geodesy and of geophysics.

The results obtained over the last year will be presented in terms of the improvements achieved in the dynamical model, in the satellites POD and, finally, in the measurement of the relativistic Lense-Thirring precession of their orbit.