General relativity tests by the dynamics of the Solar system

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Abstract

Lunar laser ranging (LLR) data, as well as high-precision ranging observations of Mercury and Mars orbiters, allow to put constraints on deviations of the physical laws in the Solar system from ones predicted by General relativity. We use the latest EPM planetary ephemeris as the basis for constraining possible additional geodetic precession, violation of strong equivalence principle, and change of the gravitational constant. In the LLR processing, we use the dynamical model of the lunar motion with near-centimeter accuracy and the JPL EOP2 corrections to the IERS2010 model of terrestrial and celestial frames.

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