
Recent updates from the INPOP lunar and planetary ephemeris team

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Résumé

Abstract:

We present the new INPOP17a[1] planetary and lunar ephemeris, which includes improvements for the planet orbits as well as the lunar interior structure. From the improvements in the lunar interior structure and the refinements to the data reduction, the LLR residuals obtained with INPOP17a range between 1.4 – 1.8 cm for the recent and most accurate data. The LLR reduction model follows IERS 2010 recommendations[2]. For the Grasse station a seasonal signal is removed with the effect identified as hydrology loading, with the help of a multi-geodetic characterization[3] confirmed with available hydrology models. Thanks to these refinements and the availability of new accurate IR LLR data from Grasse station[4], we were able to perform fundamental tests of the principle of equivalence[5] as well as identify and characterize inconsistencies[6] existing between the LLR estimated degree-3 spherical harmonics for the Moon and that obtained through the gravity field recovered from the GRAIL mission[7]. A work is in progress to identify the causation of the inconsistency, likely to be linked to the lunar interior structure model.

References:

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