

INPOP06: a new planetary ephemeris

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Abstract. We present INPOP06: a new planetary ephemeris.

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The new numerical planetary ephemeris developed at IMCCE - Observatoire de Paris, named INPOP06 (*Intégrateur numérique planétaire de l'Observatoire de Paris*), is presented. Dynamical models are shown as well as observation datasets used to adjust the solutions. Determinations of physical parameters like asteroid masses, densities, Sun oblateness and PPN β and γ are also presented. Comparisons to new *Mars Express* observations are also presented.

INPOP06 is a numerical integration of the motion of the nine planets and the Moon (Moyer 1971) fitted to the most accurate available observations. It also integrates the motion of 300 perturbing main belt asteroids, the Earth's rotation and Moon libration. Interactions between non-spherical objects and point-mass objects are also taken into account.

We used more than 45 000 observations including the last tracking data of the *MGS* and *Mars Odyssey* missions. The accuracy obtained with INPOP06 is comparable to the last versions of the JPL DE solutions and of the EPM solutions. Good estimations of physical parameters are given and compared with others found in literature. Comparisons to new observations not used in any fit (MEX) are also presented, which shows the good extrapolation capabilities of INPOP06. Two versions of INPOP exist: one using the TDB time scale, the other based on TCB.

Reference

Moyer, T. D. 1971, *JPL Technical report*, 32, 1157