Relativistic rotational effects:
application to the Earth-Moon system

David Vokrouhlický

Observatoire de la Côte d'Azur, Dept. CERGA, Grasse

Abstract. Relativistic precession and nutation phenomena of the terrestrial and lunar reference systems are discussed. Apart of the effects common to the two frames (including the well-known geodetic precession), both of them are submitted to the individual phenomena. Supplemental precession of the lunar reference frame of the order of 28.9 mas/cy is theoretically within the scope of the LLR technology of the forthcoming years. Its secular character, however, does not allow to decorrelate it easily from other phenomenologically modeled effects. A fine tuning between the geodetic and Lense-Thirring effects results in cancelling of several potentially interesting nutations of the lunar frame. Detailed analysis shows, that newly proposed value of the 'geodetic precession constant' includes a part of the Lense-Thirring terms but neglects another one. Interestingly, the omitted Lense-Thirring part is of the same magnitude but opposite sign as the added terms, which may lead to inconvenient interpretations.

Submitted as a brief communication to the IAU Symposium No. 172, Paris, July 1995

postal address: D.V., OCA/CERGA, Av N Copernic, F-06130 Grasse, France

e-mail: david at ocar01.obs-azur.fr