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Effects of the observed Earth's oblateness variation on precession-nutation: A first assessment

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The current IAU2000 nutation theory considers the Earth's dynamical ellipticity as a constant, whereas the IAU2006 precession theory uses a linear model for it. Apart from the problems of consistency between the two theories, whose full solution was proposed recently, the fundamental issue, namely whether the observed time variation of the Earth's gravity field can affect the Earth's rotation to a non-negligible extent or not, remains untreated.

This presentation is intended to share some preliminary results concerning precession and nutation. The variation of the Earth's dynamical ellipticity is modelled from one of the time series providing the time-varying Stokes coefficients, and its effects on the longitude are computed following a new method introduced by the authors to that purpose. The found variations are above the accuracy goals of GGOS, the Global Geodetic Observing System of the International Association of Geodesy, adopted by its Joint Working Group on Improving theories and models of the Earth rotation (JWG ITMER).