



Diurnal and subdiurnal signals in polar motion and UT1: theoretical developments and observational efforts

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Polar motion and UT1 contain physical signals within the diurnal and subdiurnal frequency bands. The dominant part, with the size up to 1 millisecond of arc (mas), is due to the gravitationally forced ocean tides. There is also a small variation (about 0.03 mas) due to the direct influence of the tidal gravitation on the triaxial structure of the Earth. The remaining part (up to 0.1 mas) is a geophysical effect driven by the daily cycle in solar heating giving rise to high frequency variations of the atmospheric and oceanic angular momenta (AAM, OAM). The observational evidence of diurnal and semidiurnal signals in polar motion and UT1 concerns mostly the purely harmonic ocean tide effects. The diurnal and subdiurnal variations of geophysical origin have been detected in the high resolution AAM and OAM data, though there are still significant differences between results from various models. Recent developments of technologies used to monitor Earth rotation, the space geodetic techniques - VLBI, GNSS, SLR, but also the ring laser gyroscope, rise a question about observability of diurnal and subdiurnal components of Earth rotation.

This paper gives an overview of the recent advances in theoretical modeling and observation of Earth rotation at daily and subdaily periods. Special attention is paid to the possibility of monitoring geophysical signals which are irregular to some extent therefore cannot be described by a simple harmonic model.