Geophysical Research Abstracts, Vol. 9, 09625, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-09625

Atmospheric and nontidal oceanic excitation of polar motion estimated from the output of the models ERA-40 and OMCT

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Atmosphere and oceans are important sources of changes in Earth rotation with periods from a few days to years; see (Gross, 2007, Earth Rotation Variations - Long Period, in. G. Schubert (Ed.) "Treatise on Geophysics, Inside the Earth and Planets", Vol.3, Elsevier, in press). However, comparisons of the atmospheric and oceanic angular momentum (AAM, OAM) variations with the Earth rotation parameters observed by modern space geodetic techniques, show still significant differences. These differences express other possible excitations (for example, by the land hydrosphere) and/or imperfection of the atmospheric and oceanic general circulation models. Brzeziński et al. (2005, in. IAG Symposia Series, Vol.128, pp. 591-596) studied atmospheric and oceanic excitation of polar motion from intraseasonal to decadal periods, using various available sets of OAM estimates. In this work we show results of computations based on new AAM and OAM time series. The AAM series was calculated on the basis of the output from the atmospheric circulation model ERA-40 – reanalysis (http://www.ecmwf.int/research/era/). The OAM series is an outcome of global ocean model OMCT (Ocean Model for Circulation and Tides) simulation (Thomas et al., 2001, GRL, Vol.28, No.12) excited by global fields of atmospheric parameters from the ERA-40 – reanalysis model. The excitation data cover the period between 1963 and 2001. Our calculations concern atmospheric and oceanic effects in polar motion over broad band of frequencies, starting from variations with periods of several days, through seasonal oscillations, up to decadal changes. Results are compared to the earlier estimates as well as to the excitation inferred from the polar motion data.