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A search for the high frequency atmospheric and oceanic modes in the excitation of polar motion

Aleksander Brzezinski (1) and Rui M. Ponte (2)

(1) Space Research Centre, Polish Academy of Sciences, Bartycka 18A, 00-716 Warsaw, Poland (Fax: +48/39/12-12-73, alek@cbk.waw.pl), (2) Atmospheric and Environmental Research, Inc., 131 Hartwell Ave., Lexington, MA, 02421-3126 USA, (Fax: 17817612299, ponte@aer.com)

Spectral analysis of the atmospheric angular momentum (AAM) data revealed 3 normal modes which influence polar motion, with periods -10, -1.2 and +0.6 days (Brzezinski et al., Surveys in Geophysics, Vol.23(2002), pp.33-69). The influence of these modes on polar motion can be considerably modified by the ocean response to the atmospheric forcing. Moreover, additional high frequency, large-scale modes can arise in the global ocean circulation (e.g., Ponte and Hirose, J. Phys. Oceanography, Vol.34(2004), pp.284-292). Here we use the available time series of the non-tidal ocean angular momentum with subdiurnal resolution to study the potential presence of the modes with periods between several hours and 10 days and to estimate their possible influence on polar motion. The estimated oceanic effects are compared to the corresponding atmospheric contributions derived from AAM data.