



Geophysical excitation of the free core nutation: comparison of results from two different models of the atmospheric and oceanic angular momenta

Aleksander Brzeziński (1), Anna Korbacz (1) and Maik Thomas (2)

(1) Space Research Centre, Polish Academy of Sciences, Bartycka 18A, 00-716 Warsaw, Poland, (2) Lohrmann Observatory, Dresden Technical University, 01062 Dresden, Germany (alek@cbk.waw.pl)

One of the unsolved scientific questions in the field of Earth rotation dynamics concerns the excitation mechanism of the observed free core nutation (FCN) signal. It is commonly believed that this free motion is mostly driven by quasi diurnal variations in the dynamically coupled system atmosphere-oceans, nevertheless the observational evidence remains rather poor. Our recent estimation (Brzezinski and Bolotin, 2006, Proc. Journées 2005, pp.211-214) using the NCEP-NCAR reanalysis atmospheric angular momentum (AAM) data (Salstein and Rosen, 1997, Proc. 7th Conference on Climate Variations, American Met. Soc., Boston, Ma, pp.344-348) and the non-tidal oceanic angular momentum (OAM) data from the ocean barotropic model (Ponte and Ali, 2002, GRL, Vol.29, doi:10.1029/2002GL015312) showed some positive results. We found quite high coherence near the FCN frequency between the modeled (geophysical) and observed (geodetic) excitations – between 0.7 and 0.8, with significant excess of power of the first one – by the factor of 10 to 30. But surprisingly, the geophysical and geodetic excitations were found to be out of phase at frequencies near the FCN resonance. Here we extend the FCN excitation study by using different pair of consistent AAM and OAM series (Thomas et al., 2001, GRL, Vol.28, No.12; Proc. Journées 2005, pp.203-206) derived from a high-resolution model based on the ERA40 reanalysis data (<http://www.ecmwf.int/research/era/>). Results are compared to the previous estimates.