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Subdiurnal atmospheric and oceanic excitation of Earth rotation estimated from 3-hourly AAM and OAM data

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Diurnal and subdiurnal variations of global atmospheric and nontidal oceanic angular momenta (AAM, OAM) contribute at measurable level to all components of Earth rotation, including precession-nutation, polar motion and universal time UT1. Here we study this problem using a new set of 3-hourly AAM and OAM series covering 1990-2009. The data is based on the ERA Interim short-term forecasts, which have been both used to derive AAM as well as force a OMCT (Ocean Model for Circulation and Tides) simulation that provides the corresponding OAM. We apply the complex demodulation technique to extract the diurnal, semidiurnal and terdiurnal signals from both the equatorial and axial components of the excitation series. Next we estimate parameters of the harmonic components of excitation and perform spectral analysis of the nonharmonic residuals. The estimated contributions to Earth rotation are compared to other results which are either estimated from alternative geophysical models or are expected from analysis of Earth rotation data.