Ongoing Efforts to Analyze and Use Atmospheric and Oceanic Angular Momentum Datasets for Predictions of Earth Orientation.

Nicholas Stamatakos (1), David Salstein (2), Dennis McCarthy (3), and Marshall Eubanks (4)

(1) US Naval Observatory, Washington DC, United States (nick.stamatakos@usno.navy.mil), (2) Atmospheric and Environmental Research, Lexington, MA, United States (david.salstein@comcast.net), (3) US Naval Observatory, Washington DC, United States ret/ctr; (dennis_mccart57@hotmail.com), (4) Asteroid Initiatives, Clifton Virginia, 20124; United States (tme@asteroidinitiatives.com)

We present our ongoing investigation of the use of U.S-produced atmospheric and oceanic angular momentum (AAM and OAM) estimates to improve the determination of near real-time Earth rotation and polar motion parameters and their short-term predictions. Previous investigations provided evidence that the use of AAM and OAM data sets could improve short-term EOP predictions for polar motion and possibly for UT1-UTC. The longer AAM and OAM time series created from the National Centers for Environmental Prediction (NCEP) reanalysis and the Estimating the Climate and Circulation of the Ocean (ECCO) models respectively are considered and used to determine a baseline (best-case) improvement in Earth rotation predictions. The shorter sets of data supplied by the Navy Global Environmental Model (NAVGEM) AAM and Hybrid Coordinate Ocean Model (HYCOM) OAM are then compared to the NCEP and ECCO data to estimate how well these models might be used to aid Earth Orientation predictions. The combination of NAVGEM and HYCOM model series should be internally consistent as the NAVGEM atmospheric analyses are used as forcing for the Navy HYCOM model.