Geophysical Research Abstracts,
Vol. 10, EGU2008-A-06511, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-06511
EGU General Assembly 2008

Using various sets of data of Atmospheric Angular Momentum forecasts for UT1 predictions

D. Gambis (1) , J. Y. Richard (1) and D. Salstein (2)

(1) Observatoire de Paris/SYRTE/UMR 8630-CNRS, Paris, France, (2) Atmospheric and Environmental Research, Inc, Lexington, MA, USA (daniel.gambis@obspm.fr)

Real-time orbit determination and interplanetary navigation require accurate predictions of Universal Time, UT1. On time scales shorter than 10 days, variations in Earth rotation are mostly due to atmospheric effects. As a result, the axial Atmospheric Angular Momentum (AAM) series can be used as a proxy index to predict UT1. The forecasts of weather centres are based on advancing the equations of motion of the atmosphere according to physical principles, and so the sophistication of the various models contained within the weather forecast systems are of paramount importance to the quality of the forecasts. For example, recent improvements in for the U.S. NOAA's National Centres for Environmental Prediction (NCEP) system include new radiation schemes for the model physics, a three- dimensional variation approach, and an improved vertical coordinate system; in addition new observing systems are available for assimilation. We will mention the relevance of such developments to the predictions related to AAM. We have been using AAM forecasts derived by three independent centres, i.e. NCEP, (formerly NMC), the Japanese Meteorological Agency (JMA), and the United Kingdom Meteorological Office (UKMO). These forecasts, as well as their combination have been used to predict UT1, applying an adaptive method. We present the statistics concerning the performances of forecasts obtained over a full year. Mean errors over a time span of 6 months are in the range of 400 and 700 microseconds for a forecast lead time of 5 and 10 days, respectively. In addition we study the error evolution concerning performance skills of the forecasts at horizons ranging from 1 to 10 days using the wavelet transform.