

Geophysical Research Abstracts,
Vol. 10, EGU2008-A-11605, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-11605
EGU General Assembly 2008
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Recent Advances in Atmospheric Angular Momentum Forecast and UT1-UTC Predictions

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Predicted values of atmospheric angular momentum (AAM) from the National Centers for Environmental Predictions (NCEP) have been used in the IERS Bulletin A combination since 14 August 2001 to improve the near-term UT1-UTC predictions. The introduction of AAM analysis and forecast data has greatly improved their prediction error. A 15-day AAM-derived LODR series (10 days of the most recent analysis + 5 days of forecast) is created using both pressure and wind AAM terms. The AAM-derived LODR is then integrated and the differences between a UT1 combination of geodetic-only data and the AAM-based UT1R (UTAAM) values for the 10-day AAM analysis period are computed. A best-fit linear trend and sinusoid are fit to this difference time series. These fits are then weighted and removed from the entire UTAAM time series (analysis and forecast). The resulting rectified UTAAM time series is then included in the Bulletin A UT1 combination together with the geodetic data. This procedure reduces the effects of systematic trends (both periodic and linear) that do not appear to be present in actual UT1 variability. Therefore, the process of combining the analysis and forecast data sets and any systematic characteristic of the atmospheric model's forecasts are two of the larger remaining sources of error in the UTAAM forecasts. Using the Navy's NOGAPS v4.0 atmospheric model and new forecasting products, this presentation will show how these errors can be reduced and UT1-UTC predictions improved.