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IERS Rapid Service Prediction Center Use of Atmospheric Angular Momentum for Earth Rotation Predictions

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The accuracy of near real-time estimates and short-term predictions of Earth orientation parameters (EOPs) can be enhanced by using Atmospheric Angular Momentum (AAM) accounting for the global conservation of angular momentum in the Earth system. The US Navy analysis and forecast model provided by the Navy Global Environmental Model (NAVGEN) is being improved continually, and the resultant motion and mass fields are potentially useful for operational Earth orientation applications. Similarly, the AAM data available from the National Oceanic and Atmospheric Administration (NOAA) provide another possibly important contribution to the prediction of UT1-UTC. For operational use of these data, the systematic errors in scaling and bias must be considered. Statistical models accounting for these issues were developed for both data sources to provide forecast excess length of day (LOD) estimates for up to seven days in the future. This information was then integrated in time to provide independent predictions of UT1-UTC that can be compared with past predictions of the International Earth Rotation and Reference Systems (IERS) Rapid Service/Prediction Product Center. Three years of AAM data were analyzed for these comparisons.