



Hydrodynamic Predictions of Seasonal Variations in Earth Orientation

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Short-term forecasts of atmospheric, oceanic, and terrestrial hydrospheric effective angular momentum functions (EAM) of Earth rotation excitation are combined with least-squares extrapolation and auto-regressive modelling to routinely predict polar motion (PM) and Δ UT1 for up to 90 days into the future.

Based on several experiments with more than 500 individual hindcasts from 2016 and 2017, a best-performing parametrization for the method was identified. At forecast horizons of 10 days, the prediction accuracy is 3.02 mas and 5.39 mas for PM and Δ UT1, respectively, corresponding to improvements of 34% and 44% with respect to Bulletin A. At forecast horizons of 60 days, prediction accuracies are 12.52 mas and 107.96 mas for PM and Δ UT1, corresponding to improvements of 34% and 8% over Bulletin A.

The 90 days-long EAM forecasts leading to those improved EOP predictions are routinely published once per day at www.gfz-potsdam.de/en/esmdata and are thus ready-for-use for operational EOP prediction efforts.