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Using modeled short-term angular momentum forecasts from atmosphere, ocean, and hydrology to improve 90-day EOP predictions

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Angular momentum functions based on forecasted model states can predict high-frequency mass variations within the geophysical fluids for 5-7 days into the future. In a hindcast experiment 10-day forecasts of angular momentum functions, modeled from predicted states of the atmosphere, ocean and continental hydrosphere, are used to incorporate wide-band stochastic signals into the statistically derived IERS bulletin A predictions. The combination approach concatenates the rapid solution of the past 90 days from bulletin A with one week of modeled forecasts and the trend and bias corrected 90-day prediction of bulletin A. We analyzed, how the improvements in the first days of the predicted EOPs by the model forecasts manifest itself in a decreased prediction error even at prediction days 30 or 60. Comparing the predictions with IERS bulletin A and C04 the reduction of the mean absolute error is significant in polar motion whereas UT1-UTC does not benefit much since the atmospheric excitation forecasts are already included in bulletin A.