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Oceanic tidal angular momentum from EOT08a and its impact on Earth rotation

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Diurnal and semi-diurnal ocean tides induce periodic variations in polar motion and Universal Time (UT1) amounting to approximately 3 cm on the Earth surface. As such short-period variations are not reported in the Earth rotation parameter series of the IERS, they have to be accounted for in the analysis of space geodetic observations by applying appropriate models. Currently available models recommended in the IERS Conventions for the effect of diurnal and semi-diurnal ocean tides on Earth rotation are somewhat outdated and are suspected of causing aliased signals with longer periods for example in GNSS orbit determination. They are based on ocean tidal heights and currents which have been derived making use of only a short time span of satellite altimetry measurements. Since the release of these models substantial progress in the modeling of ocean tides has been achieved through the analysis of increasingly long time series of satellite altimetry data and refinements in hydrodynamic modeling. We employ EOT08a, a new empirical ocean tide model from multi-mission satellite altimetry to investigate the tidal angular momentum budget of the major semi-diurnal and diurnal tidal constituents. The effect of the ocean tides on polar motion and UT1 is subsequently calculated by using conservation of angular momentum.