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Observing atmospheric tides in Earth rotation parameters with VLBI

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In this study, we assess the contribution of diurnal (S1) and semi-diurnal (S2) atmospheric tides to variations in Earth rotation by analyzing Very Long Baseline Interferometry (VLBI) observations. Particular emphasis is placed on the dependency of S1 and S2 estimates on varying settings in the a priori delay model. We use hourly Earth rotation parameters (ERP) of polar motion and UT1 as determined with the Vienna VLBI Software (VieVS) from 25 years of VLBI observations and we adjust diurnal and semi-diurnal amplitudes to the hourly ERP estimates after disregarding the effect of high-frequency ocean tides. Prograde and retrograde polar motion coefficients are obtained for several solutions differing in processing strategies (with/without thermal deformation, time span of observations, choice of a priori ERP model and celestial pole offsets) and we compare the corresponding harmonics with those derived from atmospheric and non-tidal oceanic angular momentum estimates.