



Applying atmospheric pressure loading to geodetic analyses: daily corrections or at the observation level?

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Atmospheric pressure loading deforms the surface of the Earth, with the pattern of deformation varying on both spatial and temporal scales. The effect is largest in the vertical component and can reach magnitudes of up to 15 mm. More importantly, the deformation can vary by as much as 10 mm within a 24 hour period. This raises the question of whether atmospheric pressure loading can be accounted for adequately by simply applying a daily-averaged correction to daily geodetic estimates of site coordinates or whether, similar to ocean tide loading effects, the corrections should be applied at the observation level when computing the daily coordinate estimates. Additionally, the S1 and S2 atmospheric tides - that contribute up to 3 mm in vertical surficial deformation - are not well sampled by some global pressure data sets where values are provided only every 6 hours. In this presentation we will demonstrate how different time series of site coordinates can be generated according to the analyst's choice of how to account for the effects of surficial deformation caused by atmospheric pressure loading.