



The solar tidal component SW3 in ionospheric parameters

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In recent years there have been many reports about tidal signatures in the upper atmosphere. Particularly prominent are the wave-4 longitudinal structures which have been related to the eastward propagating tidal component DE3. This tide is believed to be driven by deep tropical convection in the troposphere. In this presentation we will focus on another tidal component, the westward propagating semi-diurnal tide SW3. During certain seasons it can be rather prominent in various ionospheric parameters. Conversely, it does not seem to be important for thermospheric quantities. Lühr et al. (2012) reported for the first time about a dominant SW3 in the tidal spectrum of vertical plasma drift. Later prominent tidal SW3 signals were also found to modulate the intensity of the equatorial electrojet and the longitudinal distribution of the equatorial ionisation anomaly. Closer inspection revealed that the amplitude of SW3 is closely controlled by the level of solar EUV flux, but there is no dependence on magnetic activity. The preferred season for SW3 is around December solstice and a secondary maximum appears during the months around May. All these observations imply that SW3 is not driven by influences from below. We prefer an in-situ mechanism as the cause for the tides, but cannot offer a conclusive explanation at the moment.

Lühr, H., M. Rother, K. Häusler, B. Fejer, P. Alken (2012), Direct comparison of non-migrating tidal signatures in the electrojet, vertical plasma drift and equatorial ionization anomaly, *J. Atmos. Solar-Terr. Phys.*, 75-76, 31-43, doi:10.1016/j.jastp.2011.07.009.