



El Niño influence on the mesosphere/lower thermosphere circulation seen by a VHF meteor radar at Collm (51.3°N, 13°E)

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Mesosphere/lower thermosphere (MLT) zonal winds continuously measured by a VHF meteor radar at Collm, Germany (51.3°N, 13.0°E) in the height range 82 – 97 km from 2004 to date are analyzed with respect to the signature of El Niño. The comparison of Niño3 equatorial SST index and MLT wind time series shows that in January and especially in February zonal winds are positively correlated with the Niño3 index. We note a delay of about 1 month of the MLT zonal wind effect with respect to equatorial sea surface temperature variability. The signal is strong for the upper altitudes (above 90 km) accessible to the radar observations, but weakens with decreasing height. This reflects the fact that during El Niño years the westerly winter middle atmosphere wind jet is weaker, and this is also the case with the easterly lower thermospheric jet. Owing to the reversal of the absolute El Niño signal from negative to positive with altitude, at the height of the maximum meteor flux, which is around 90 km, the El Niño signal is weak. The experimental results can be qualitatively reproduced by numerical experiments using a mechanistic global circulation model with prescribed tropospheric temperatures and latent heat release for El Niño and La Niña conditions.