



## Nonmigrating tides in the thermospheric zonal wind as observed by CHAMP: inter-annual, latitudinal, and solar flux variability

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The German satellite CHAMP burnt up in September 2010 after being in orbit for 10 years, 2 months, and four days. During that period, CHAMP provided continuous and globally distributed measurements of the upper atmosphere at about 400 km altitude. An unexpected result was the detection of a four-peaked longitudinal structure (wave-4) in the zonal wind which is predominately caused by the eastward propagating diurnal tide with zonal wavenumber 3 (DE3). The nonmigrating DE3 tide in turn has its origin in the tropical troposphere, thus coupling tropospheric weather with the geospace environment. Besides the strong DE3 tide, further nonmigrating tides are present, among them the eastward propagating diurnal tide with zonal wavenumber 2 (DE2), the westward propagating diurnal tide with zonal wavenumber 2 (DW2), and the standing diurnal tide (D0). For our study we make use of the recalibrated accelerometer data which are available from June 2001 to August 2010. Inter-annual and latitudinal variations as well as solar flux dependences are presented for the various nonmigrating tides observed in the CHAMP zonal wind. They are further compared to the predictions of an empirical model based on Hough Mode Extensions which are fitted to tides observed by TIMED around 100 km altitude.