



Tidal wind observation from a meteor radar chain located at mid- and low-latitudes along the 120°E meridian in the Northern Hemisphere

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A 4-station meteor radar chain, which locates along the 120°E meridian in the Northern Hemisphere, was recently established by the Institute of Geology and Geophysics, Chinese Academy of Sciences (IGGCAS). In this work we first detect the tidal components of the upper atmospheric winds from the observations of this radar chain during 2011 and 2012. The spatial and temporal variations of these tidal components (diurnal, semidiurnal and terdiurnal tidal components) are further investigated. It is found that the diurnal component dominates at the low-latitude stations and the semidiurnal component dominates at the mid-latitude stations. The amplitudes of these two components increase rapidly at lower altitudes and then decrease at higher altitudes after reaching a peak in MLT region. Finally, the latitudinal distribution of each decomposed tidal component is fitted to obtain different tidal modes (Hough modes) according to the classical tidal theory. It is obtained that the diurnal component is dominated by the first symmetric (1, 1) mode; while for the semidiurnal and terdiurnal components, the dominant modes are the second symmetric modes (2, 4) and (3, 5), and the considerable contributions are also from the first anti-symmetric modes (2, 3), (3, 4) and second anti-symmetric modes (2, 5), (3, 6).