Signature of the Semidiurnal Tide in the Equatorial MLT

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Semidiurnal tidal features have been examined in the Mesosphere and Lower Thermosphere (MLT) from the long-term (2002-2007) meteor wind data over Maui (20.75^{o}N, 156.43^{o}W). Amplitude and phase obtained from the harmonic analysis exhibit large day to day variability. Mean amplitude obtained from the monthly mean data over the observation period is found to vary within ~ 8-28 m/s and 10-32 m/s for the zonal and meridional winds, respectively. The amplitude has evinced clear semiannual oscillation (SAO) pattern and altitudinal growth in both wind components. Vertical wavelength estimated from the phase gradients exposes large values (> 90 km) in all seasons. Contribution of the semidiurnal tide to the total tidal response is found to vary over wide range (16-44%) throughout the year with generally higher influence during winter season.

Keywords: Semidiurnal tide, MLT, Meteor radar

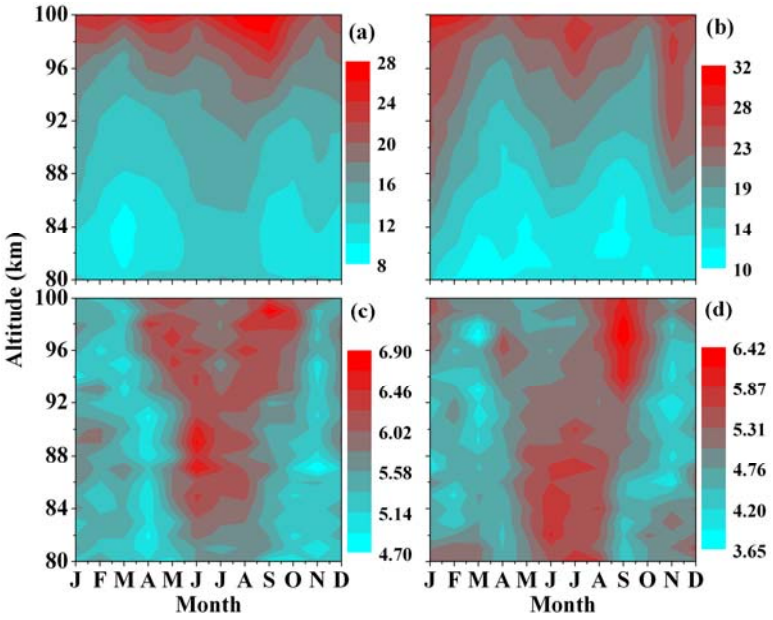

Figure 1. Long term mean (2002-2007) amplitude of the semidiurnal tide in the (a) zonal wind, (b) meridional wind and phase of the same in the (c) zonal wind and (d) meridional wind.