Equatorial Atmospheric Kelvin Waves during 2014-2016 El Niño episodes andtheir effect on Stratospheric QBO

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Equatorial atmospheric Kelvin waves are investigated during positive El Niño Southern Oscillation (ENSO) episodes using temperature data retrieved from GPS Radio Occultation (RO) observations of FORMOSAT-3/COSMIC 5 during the period from August 2006 to April 2016. Enhanced Kelvin wave activity is observed during the El Niño episodes of 2010 and 2014-2016 and it is also observed that the Kelvin wave amplitudes correlate with the Niño 3.4 index and also with outgoing longwave radiation and trade wind index. This study indicates that the enhanced equatorial atmospheric Kelvin wave activity might be produced by geophysical processes that were involved in the onset and development of the El Niño episode. Further, easterly winds above the tropopause during this period favoured the vertically upward propagation of these waves that induced a fast descending westerly regime by the end of 2010 but showing different behaviors during 2014-2016 period.The current study presents observational evidence of enhanced Kelvin wave activity during El Niño that has affected the stratospheric quasi-biennial oscillation (QBO) through wave-mean flow interactions. Detailed comparison between the ENSO episodes of 2010 and 2014-2016 will be investigated in this study.

Keywords: El Niño Southern Oscillation , quasi-biennial oscillation (QBO)

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