Equatorial Kelvin waves Observed with FORMOSAT-3/COSMIC Radio Occultation Data

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Abstract

Since Wallace and Kousky (1968) discovered Kelvin waves in the tropical stratosphere by radiosondes, the Kelvin waves are considered one of the most dominant gravity waves, particularly significant for the dynamics of the middle atmosphere. Due to the success of the FORMOSAT-3/COSMIC GPS occultation experiment (GOX) since April 2006, better observational results from GPS radio occultation (RO) experiment, which are retrieved from RO measurements and then assimilated with NCEP AVN forecast data, becomes achievable as the sounding profiles of atmospheric temperature are of better quality and quantity than before. We use the COSMIC temperature profiles for August-October 2006 to study wave propagation and structure of the equatorial Kelvin waves by analyzing temperature fluctuations in the upper troposphere. The results show phase progression and wave structure of Kelvin waves and corresponding wave periods and amplitudes for dominant wave numbers 1 and 2.

References

Wallace, J.M. and V.E. Kousky, 1968: Observational evidence of Kelvin waves in the tropical stratosphere, *J. Atmos. Sci.*, **25**, 900-907.