

Study on the Vertical Wavelength of the Atmospheric Kelvin Waves

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By using a length of 35-years old dataset of temperature from ECMWF re-analysis, the characteristics of the vertical wavelength of Kelvin waves to understand the effect of El Niño Southern Oscillation (ENSO) on the Quasi Biennial Oscillation (QBO) is analyzed. We concluded that the increased vertical wavelength could be the reason for the Kelvin wave not being able to interact with the mean flow. The observations indicated a clear modification in wave properties during the El Niño episode and emphasized the sensitivity of the atmospheric waves to various wave generation processes. An interesting event is the 12-day wave at wavenumber 1 whose vertical wavelength is approximately 10 km throughout the period of study and the phase lines do not 'see' the mean flow. The waves that do not interact with the mean flow must be traveling at higher altitudes. We also analyzed the temperature variation of upper atmospheric data to exam further details and the present study provides information regarding on the long-term morphology of the vertical wavelength.

Keywords: Kelvin Waves, ENSO/QBO, Long-term Morphology