

Interannual variability of equatorial Kelvin waves around the tropical tropopause influenced by the background wind

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The influence of the background wind on the equatorial Kelvin waves around the tropical tropopause (TTL) was investigated. We focused the variabilities of number of the Kelvin wave cases through the westerly basic wind using the zonal wind index (ZWI) in the western hemisphere. The positive (negative) ZWI periods were largely consistent with the La Niña (El Niño) phases. However, the five ZWI peak months of eight recently after 1979, occurred other than La Niña and El Niño DJF. Though the previous studies (*Flannaghan and Fueglistaler, 2013*; and *Yang and Hoskins, 2013*) discussed the interannual variabilities of the Kelvin waves classified according to the ENSO index in DJF, we need to use the ZWI, index on the basis of zonal wind, to discuss the wave propagativity influenced by the zonal wind. In the positive ZWI period, both source activities of the large scale convections over the western Pacific and amplification by the extratropical Rossby wave were active. Therefore the Kelvin waves over the western hemisphere could appear frequently at 200 hPa but could not reach at 100 hPa through the strong westerly wind. On the other hand, the number of the Kelvin wave cases at 200 hPa were decreased during the negative ZWI period due to the inactive source conditions. In the negative ZWI, Kelvin waves could reach at 100 hPa and move upward through the weak background wind because many waves propagated with the organized convections (convectively coupled).

Key words: tropical tropopause layer, equatorial Kelvin wave

References

Flannaghan, T.J., and S. Fueglistaler, 2013: *Journal of Geophysical Research: Atmospheres*, **118**, 5160-5175.

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