Effect of Kelvin Waves on stratospheric QBO during *El Nino* periods using ECMWF reanalysis data

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35-year long dataset of temperature from ECMWF reanalysis has been analysed to obtain characteristics of Kelvin waves to understand the effect of El Nino Southern Oscillation (ENSO) on the Quasi Biennial Oscillation (QBO). Enhanced Kelvin wave activity is observed during El Nino periods when the phase of the QBO was easterly. Slow waves of wavenumber one and periods greater than 12 days are the most prominent Kelvin waves in the stratosphere during these periods, and showed significant wave-mean flow interactions. Comparison with outgoing longwave radiation (OLR) showed that there is increased convective activity over the Indonesian region and the East Pacific region during these periods of enhanced Kelvin wave activity. However, the rate at which the zero wind line preceding the westerly descended from 10 hPa to 50 hPa was not quite high, as was observed in the case of the 2009/2010 El Nino period. Careful examination showed that, instead of fixing the initial height at 10 hPa, if the slope of the zero wind line was calculated from the height at which the enhanced Kelvin wave activity interacted with the mean flow, the westerly did indeed descend very fast. Thus we conclude that during those El Nino periods when the QBO was easterly, the subsequent westerly showed an anomalous descent. This study emphasizes the importance of wave-mean flow interactions in maintaining the large scale circulation of the Earth's atmosphere.

Keywords: El Nino Southern Oscillation (ENSO), Quasi Biennial Oscillation (QBO)

