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Direct measurement of westerly zonal momentum flux from Kelvin waves in the stratosphere remains challenging. This flux is crucial to the lower stratospheric, easterly-to-westerly transition of the roughly 28 month oscillation of tropical stratospheric zonal winds known as the quasi-biennial oscillation (QBO). As the QBO has global impacts on chemistry, weather, and climate, constraining observational estimates of the forcing of this oscillation is useful for improving global climate and weather forecast models.

Here we present results from an analysis estimating the large-scale Kelvin wave amplitudes and momentum fluxes. This analysis uses a multiple frequency linear least squares spectral analysis method on post-processed radio occultation (RO) data to derive observational estimates of the Kelvin wave amplitudes. Improvements of measurement errors from our method relative to previously published methods are shown through a detailed comparison utilizing reanalysis data interpolated to RO locations. Using linear wave theory, we then estimate the observed momentum flux from the various means of deriving temperature amplitudes, detailing the advantages of each technique in resolving lower stratospheric phenomena such as the westerly QBO transition.
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