



Global morphology of gravity wave activity in the stratosphere

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Global morphology of gravity wave activity in the stratosphere revealed by years of SABER/TIMED data. From SABER/TIMED temperature profiles, we studied the activity of gravity waves in the stratosphere globally. Global distribution of stratospheric gravity wave potential energy was calculated from the temperature perturbations. Seasonal comparison of gravity wave potential energy E_p shows an annual variation in middle and high latitudes and a semiannual variation in the tropics. Around the equator, gravity wave interannual enhancements are identified just below the zonal wind zero contours corresponding to descending eastward shear phase of the QBO. Furthermore, we provide observation evidence to support the conclusion that the deep convection is a major source for the observed tropical gravity wave activity. The considerable longitude variations of largest potential energy around the equator are related not only to the specific topography and tropical convections but also to many other factors. We can infer that topography and tropical deep convection are the important sources of the gravity waves in the stratosphere, but the observed gravity waves in the tropical/subtropical stratosphere are strongly affected by winds with different QBO phases.