

Global studies of stratospheric gravity wave activity using COSMIC GPS-RO

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Temperature data obtained from COSMIC have resulted in a more detailed understanding of global and regional scale gravity wave activity on shorter time intervals in the lower stratosphere than previously possible. Specifically, the data allow the resolution of waves with vertical wavelengths of around 2km – 10km on time scales of the order of one week. Using these data, we have studied convectively generated gravity waves in the tropical region, and observed hemispheric and regional scale changes in wave energy which are related to the convective source as well as background wind conditions. In the polar regions, we have determined the latitudinal extent of enhanced gravity wave activity around the stratospheric vortex edge. COSMIC has revealed the symmetric presence of increased gravity wave activity near the vortex edge around the 500K isentrope during Antarctic springtime decay. Most of the wave energy observed by COSMIC above various mountainous regions in the polar and sub-polar regions can be attributed to the presence of orographically generated waves.