



AIRS measurements of stratospheric temperature: a new data set for gravity wave studies

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The Atmospheric Infrared Sound (AIRS) is one of the six Earth-observing instruments aboard NASA's Aqua satellite launched in May 2002. It continuously measures infrared spectra (3.7-15.4 micron, 2378 channels) in the nadir and sub-limb scanning mode. AIRS samples the atmosphere with high horizontal resolution: The nadir footprint is about 1.1° times 0.6° . A typical 'granule' of AIRS data is acquired in 6 minutes' time and consists of 135 swaths along the satellite track, each containing 90 individual sub-limb measurements across-track. The operational retrieval for AIRS does not provide temperature data at the full AIRS horizontal resolution, but instead uses nine pixels to derive a cloud-cleared radiance spectrum and a single temperature profile. By restricting ourselves to cloud-free, stratospheric measurement channels, we are able to retrieve temperature data from the 4.2 and 15 micron carbon dioxide emissions at full horizontal resolution. In this presentation we briefly describe our new fast forward model for AIRS and the retrieval method applied. We show first comparisons of retrieved temperature data against independent measurements. The new temperature data set is of particular interest for studies of small-scale temperature features caused by gravity waves. We finally show several case studies of spectacular gravity wave events as observed by AIRS during its five year measurement period.