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## Comparing gravity waves in a kilometer scale run of the IFS to AIRS satellite observations

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Gravity waves impact the large scale circulation, and increasing our understanding of them is important to improve weather and climate models. This presentation focusses on atmospheric gravity waves in the stratosphere using data from the ECMWF ERA5 reanalysis, AIRS (Atmospheric Infrared Sounder) on NASA's Aqua satellite and a high resolution run of the IFS operated at a km-scale spatial resolution. Data was examined during the first 2 weeks of November, as the high resolution model was initialized on the 1<sup>st</sup> of this month. Asia and surrounding regions are investigated, because preliminary studies of AIRS data suggested strong gravity wave activity in this region during this time period. Waves can also be seen in the ERA5 data at the same times and locations. The high resolution model also shows significant gravity wave activity in similar areas to where it is seen in the AIRS data, particularly over Russia. The 2D+1 S-Transform was used to find wave amplitudes, horizontal and vertical wavelengths and momentum flux for all three datasets. Weather models are advancing rapidly and km scales such as the experimental IFS run could become operational in next decade. At these grid scales, gravity waves must be resolved instead of parameterized so the models need to be tested to see if they do this correctly. This work provides information on how a cutting edge model resolves gravity waves compared to observations.