

## ***Interactive comment on “Intercomparison of stratospheric gravity wave observations with AIRS and IASI” by L. Hoffmann et al.***

### **Anonymous Referee #1**

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This paper compares the stratospheric gravity waves in two nadir viewing instruments, AIRS and IASI. Although the AIRS gravity waves have been extensively investigated by many scientists, this is the first paper introducing stratospheric gravity waves observed by IASI. Careful characterizations of the two instruments are performed by the authors. The discussion of the impact of noise upon the observation is satisfactory. Several case studies of mountain waves and convective gravity waves are presented. The morphology of these gravity waves are in well agreement between AIRS and IASI. Furthermore, statistical studies are carried out to examine the diurnal, seasonal and spatial variations of stratospheric gravity waves in both AIRS and IASI. The "hot spots" of mountain waves and convectively generated gravity waves agree with previous findings.

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This is a well-written paper and the analysis of the gravity waves in IASI is significant. Indeed, it is promising in the near future to combine both AIRS and IASI measurements and broaden the spatial and temporal coverage of stratospheric gravity waves in the global scale. I recommend the paper to be published at AMT with a minor revision.

Major comments: 1. The non-LTE effect is important for the daytime CO<sub>2</sub> 4.3  $\mu\text{m}$  brightness temperature measurement. Please elucidate its effect with one paragraph. Does the non-LTE effect both AIRS and IASI in the same way?

2. Can the authors comment on the possible CO<sub>2</sub> 15  $\mu\text{m}$  measurement of gravity waves by AIRS and IASI?

Minor comments:

1. Abstract: suggest to remove the actual numbers of 45% and 30%. Without their definitions (relative to which value?), these numbers are confusing.

2. page 5, line 6: are these equator crossing times? if so, please mention it explicitly.

3. page 9, line 5-7: please explain this exception. Seems all the tropospheric emissions are not important in the last sentence (line 3-5).

4. Figure 5, It reads odd to have "sensitivity" as x-axis in the left-hand panel and as y-axis in the right-hand panel. Please make these two panels consistent.

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