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Comment

Interactive comment on “Assessment of Odin-OSIRIS ozone measurements from 2001 to the present using MLS, GOMOS, and ozone sondes” by C. Adams et al.

C. Adams et al.

cristen.adams@usask.ca

Received and published: 16 August 2013

Thank you for your comments, which have helped to improve our manuscript. Below we address the recommended changes point-by-point.

This reviewer is having some trouble sorting out the effect of the temperature and ascending/descending orbits on the ozone retrievals. Plots such as figure 12a (or 2g) comparing to MLS showing the ascending data and the descending data separately would help. Or text describing the differences (or similarities) and a discussion recommending to the reader if one orbital geometry yields superior results (or not). Figure

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7 does a good job, but a single (global) line plot would help. What percentage of the matchups are ascending vs descending? Figure 3e and Figure 7ef seem to indicate that almost all the measurements are on the ascending node.

We will add a figure with single global line plots of percent differences for OSIRIS ascending versus descending node measurements versus the three validation datasets, as recommended. Along with this figure, we will discuss the number of coincidences in each node. In order to clarify that the optics temperature and ascending versus descending node biases are different, we will add the following text:

“Note that the ascending versus descending node biases are separate from the optics temperature biases (discussed in Sect. 5.2.1). The bias with optics temperature is apparent when comparisons are performed for only one OSIRIS measurement node (not shown here). Similarly, the ascending versus descending node biases are observed when a restricted optics temperature range is used (not shown here).”

GOMOS/MLS also measures aerosols. It would be useful to see a plot (or short discussion, reference) showing/describing comparisons to OSIRIS aerosols as figure 8 explains nothing on how good the aerosol retrievals are in an absolute sense. A validation of OSIRIS aerosol is outside of the scope of the present study. We will also add the following text:

“OSIRIS aerosol has been validated previously with SAGE II and SAGE III and was found to agree within 15% for the lower stratosphere (Bourassa et al., 2007; 2012).”

Figure 9b isn't very informative. Suggestion: a figure similar to 9a for OSIRIS-MLS for ascending descending.

We will split Fig. 9b into panels for ascending and descending node measurements.

SPECIFIC COMMENTS

Figure 5a At 17km the OSIRIS/MLS differences look slightly negative. But figure 3a says it should be very negative. Why the difference? Are all the points in fig 3a from 60S

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to 40N at the same temperature (14C)?? If so, this needs some discussion because it is not obvious what is going on. Fig 5b and 3c look consistent. But where are all the negative values seen in fig 3e in 5c?

We will add the following text to explain this apparent discrepancy:

“Note that the larger low biases observed below 22.5 km at lower latitudes (Figure 3) are not apparent here for comparisons with MLS and ozonesondes because most of these coincidences are at higher latitudes.”

The following will all be corrected as recommended

Page 3822 Line 5 Please define ‘SPIN’

3824 Line 15 : : :“conclusions about OSIRIS quality is improved”. Compared to what? Previous conclusions from earlier papers??

3835 Line 18 “the word “relative” needs to be removed

3836 Lines 17-23 Please re-word that paragraph when discussing the drifts. It is written as if all the drifts are within the 3% envelope. Suggestion: “relative drifts including error bars are all within +/-3%”

Figure 2: Change (Right) to (Bottom)

Figure 3: Fix tropopause line on figure 3d

Figure 4b: Please define red blue lines

Figure 10: Caption says 32.5km: : ..

Figure 11: Fix tropopause lines.

Interactive comment on Atmos. Meas. Tech. Discuss., 6, 3819, 2013.

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