

## ***Interactive comment on “Validation of MIPAS IMK/IAA V5R\_O3\_224 ozone profiles” by A. Laeng et al.***

### **Anonymous Referee #1**

Received and published: 16 June 2014

#### General comments:

The paper by A. Laeng et al., “Validation of MIPAS IMK/IAA V5R\_O3\_224 ozone profiles” compares MIPAS ozone profiles with measurements from a number of space-based, balloon-borne-based, and ground-based instruments. This paper performs pole-to-pole validation of MIPAS using extended reference datasets and similar methodologies as the earlier paper. Characterization and assessment the error estimates of MIPAS data is of values for the data users. However, the geophysical validation needs to be improved, for example, the comparison of the climatology calculations or the lon-lat mapping of the bias. The figures are well constructed and the flow of the paper is well organized, but some of the writing needs to be corrected.

C1346

1. Figure 4 should give the definition of the color scales.
2. In section 5, the author proposed to evaluate natural variability by eq. 6, and point out that it might not be good for higher latitudes. Have you ever evaluate that natural variability using an independent way, such as the method proposed by Von Clarmann (2006).
3. Follow the previous comments, in page 3965, line 1-6, the author claims the reason is large geophysical variability. But you also claim that in section 5, the estimates might not be good for higher latitudes, please address this conflict issue.
4. Page 3966, Figure 7 compares the slopes with 1:1 relationship, but I do not see any slope in the figure. The text is not easy to follow. A linear regression should be plotted, and it is better to also provide some statics:  $y=ax+b$ , R value, for example. My suggestion would be to pick up several typical altitudes instead of all levels.
5. Also in Figure 7, the bottom right panel (with OSIRIS), MIPAS varies from minor values to 1 ppmv while OSIRIS keep zero, how does that happen? And the top right panel (with SAGE) seems using a different symbols, if so, you may need to re-plot it.
6. Figure 8 shows that the bias with respect to MLS depends on time, how about similar comparison with other measurements. Similar comparisons are showed in figure 9, it's better to combine these two figures together. What about the pattern of the residual variability? Could you give some statements about this? In Figure 8 and 9, only some particular latitude bins were chosen, could you give reasons?
7. In section 8, page 3971; the final statement is “over all, this MIPAS dataset has a small bias with respect to standard small-biased data . . .”, this may not be correct and does not consist with the statements in page 3965. And in the conclusion part you should also give some statement about the time dependent bias.
8. Figure 12 is poorly plotted. Lines with different colors are not fully explained, neither in the caption nor in the text.

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Minor comments/typos:

Page 3956, line 1; Remove "Understanding such ozone fluctuations" as it appears in the next line again.

Page 3956, line 8-9; Change "MIPAS measured ... , providing ... per day" to "... and provided ... per day"

Page 3956, line 10; measured -> operated

Page 3957, line 2, line 7, line 9; "... Reduced Resolution ..." and "...Processor ..." change the capital to lower case.

Page 3957, line 5; it is better to use "large bias" rather than "high bias".

Page 3957, line 9; "... had a peak of particularly poor vertical resolution ..." do you mean the "peak" is a maximum FWHM of the vertical resolution? It is not clear with this statement.

Page 3961, line 15; "... by analyzing ..."

Page 3963, line 17; typo "homogemious"

Page 3963, line 21; "...with estimated number about 4%." Add "of" after "number"

Page 3966, line 2; "ozone sondes" should be "ozonesondes" as you already use it in other places. The inconsistent appears at several places, please also correct them.

Page 3968, line 3; "As a function of SZA", and the full name of SZA should be given when it appears for the first time.

Page 3970; line 4; "... is found: ..." change colon to full stop.

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Interactive comment on Atmos. Meas. Tech. Discuss., 7, 3953, 2014.