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Interactive comment on “Intercomparison of ILAS-II Version 1.4 and Version 2 target parameters with MIPAS-Envisat measurements” by A. Griesfeller et al.

A. Griesfeller et al.

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Reply to Referee #2

First of all, we would like to thank the reviewer for his helpful comments. In the following, our reply to the specific points are listed (the italic parts are the reviewer's comments.).

Major Point *The paper effectively uses MIPAS as the standard against which ILAS version 1.4 and 2 are compared. There is an implicit assumption throughout the manuscript that MIPAS data is correct. While this is generally true a brief discussion of the state of the various MIPAS data products is required at the beginning of the section (where is it reliable, what are the known uncertainties and biases). Following this, any discussion of differences between MIPAS and ILAS II can be placed in this context so*

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that we can know when ILAS is unrealistic or flawed rather than have it just asserted by the authors.

ANSWER: A description of MIPAS validation results or results of comparisons with other measurements has been added in each section.

The paper contains 12 pairs of figures that are quite repetitive. This is inevitable given the nature of the paper but the accompanying text is little more than a rehash of the figures. I can read the figures pretty well myself so much of this text is of little or no value. What would be of more interest is there understanding of why some large differences still exist? What are the authors' views on where the ILAS data is useful and where it is not? When I read a paper of this sort, I expect to come away with a feeling regarding the usefulness of the data sets. Based on this paper, I come away with the general feeling that ILAS Version 2 is better than previous versions but still not fully trustworthy and I would tend to stay away from it. Is this what the authors intend? If not, tell me where it is useful.

ANSWER: To avoid the rehash of figures, the Results section is now re-organized. Now the Results section is changed to: Coincidence criteria, Monthly averaged profiles, and Hemispheric averages and differences between ILAS-II and MIPAS. Then, differences between the two ILAS-II versions and between ILAS-II and MIPAS are discussed in detail in the Discussion section.

Regarding why some large differences still exist in V2 is discussed in the revised paper. The signal distortion in the sunrise mode measurement (NH) seems to impact depending on the species and altitude, although the cause of this is unknown. The H₂O value is affected at the most, so that it was wrong above 20 km in V1.4. Although the transmittance correction was applied in V2, still it might be not enough for H₂O data for altitudes above 40 km. Therefore, we do not recommend using the NH H₂O data above around 40 km even for V2.

The revised paper states where the updated V2 data are useful or still have difficulties

clearer. In this study we have shown that for most cases the ILAS-II V2 data fit better with the other validated data than V1.4 data. Still a further study is needed especially for H₂O data in the SH.

Minor Points *The short descriptions in the introduction regarding why the various species are important is not particularly enlightening. I think a discussion of what the authors plan for the paper would be more helpful to readers. Something to the effect that previous validation papers were based on ILAS II Version 1.4. Improvements to the retrieval software have improved the data products and been released as Version 2.0.*

ANSWER: Introduction is now re-written in the revised paper. We briefly introduce an importance of measured species. Then, we present the background of validation results of ILAS-II V1.4 and the reason why improvements to V2 was necessary. Finally, a plan for this paper is mentioned.

This paper shows the improvement for these species as shown through comparisons with MIPAS. I don't think you can use ILAS II to validate MIPAS even where MIPAS validation papers do not currently exist.

ANSWER: We didn't intend to use ILAS-II to validate MIPAS, but the other way round. Even for gases, for which there are currently no MIPAS validation papers, these gases were already compared to other measurements. This information is also included in the paper right now.

Results section (9324, 15) What is the justification for the coincidence criteria? Are the comparisons sensitive to changes in the criteria? The current justification is not adequate. Is there any reason to be concerned as to whether the MIPAS results are for daytime or nighttime?

ANSWER: The coincidence criteria were chosen approximate to those used for MIPAS validation studies or comparisons with other measurements. No significant im-

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provement has been found in case of stricter criteria.

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