

Interactive comment on “Validation of MIPAS-ENVISAT H₂O operational data collected between July 2002 and March 2004” by G. Wetzel et al.

Anonymous Referee #2

Received and published: 23 April 2013

General Comments:

This paper presents an evaluation of the ENVISAT/MIPAS high-resolution data from the operational processor. A wide variety of correlative data sets have been used for these intercomparisons (including satellite, balloon, airborne and ground-based instruments). The differences have been compared to the combined total errors in most evaluations in order to understand the significance of the differences.

This work is definitely appropriate for publication in ACP after revisions to address the comments below. This paper provides a detailed description of this operational data set which is necessary for appropriate use of the data set. This is a useful contribution

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to the scientific literature.

Specific Comments (major):

Vertical coordinate: As noted on P. 4441, L. 10-11 pressure is the typical vertical coordinate used. The authors should include a brief description of how any conversions from altitude coordinate were done and any assumptions made in this.

Coincidence criteria: I found that the coincidence criteria, the altitude used to evaluate coincidences and the numbers of pairs was not obvious in all sections throughout the paper. Was the location of each measurement with respect to the vortex taken into account in these coincidence calculations? If not, what is the potential impact of this for the comparisons? For example, a number of the balloon flights were at high latitudes in winter/spring. Overall, it would help the reader to make the coincidence information more obvious in each section (referring as appropriate to information in tables or plots). I would ensure that this information was mentioned in the text as well as the tables/figures.

Description of smoothing used: It is not clear in all cases where smoothing has been used. It would be beneficial at the beginning of each subsection to make a statement or ensure that it is clear in the text where it has or has not been used. In some sections, the vertical resolution or sampling is discussed but in others it is not. This should be done consistently for all comparison instruments.

Trajectory matching to increase coincidences: This paper would benefit from a more complete description of this technique since it has been used extensively for the airborne and balloon comparisons. Appropriate reference(s) should be added and a description of any model output used for this should be included. Also, it would be helpful to have listed the number of coincidences found by using this technique.

Sect 3.4, radiosondes: With the extensive work being done by GRUAN, it would be useful to include a bit more information on which radiosondes were used for this inter-

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comparison and what corrections have been applied to the profiles (if any). Are there limitations for this comparison with altitude? Also, it is not clear why a different plotting method for the errors is used in Fig. 18 (e.g. why no SD etc.).

P. 4455, L. 1-4: While the information being discussed is present in Table 5, I would suggest that the authors consider a summary plot of the absolute / relative differences to illustrate these conclusion points. Also, it would be helpful to the data user if both pressure and altitude ranges were listed in the summary/conclusion.

Specific Comments (minor):

P. 4439, L. 1: It is not clear what "the newly processed ML2PP_V6" is at this point in the paper. A reference or further discussion is needed if this is to be maintained here.

P. 4440, L. 18: Could the authors provide a bit more detail on the width of these microwindows for MIPAS and for the other satellite retrievals? It would assist in contrasting the retrievals from MIPAS-E and other instruments (ACE-FTS, HALOE, etc.).

P. 4441, Eq. 2: Could the authors explain the choice of using the validating instrument as the denominator?

P. 4443, L. 27-29: Were all of these microwindows used for the retrieval? This should be clarified for the reader.

Table 3: What is the SZA range limitation used? Is this in addition to the coincidence criteria?

Throughout: Take care in using consistent terminology. For example, P. 4444, L. 10, are combined total errors or combined systematic errors meant here?

In airborne and balloon comparison sections, headings could be used to help guide the reader to find part on each instrument (Sect. 3.1 and 3.2).

Some assistance from the copy-editor at ACP would help to fix up minor grammatical issues throughout the text.

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Technical Corrections:

P. 4435, L. 3-4: I think that Environmental Satellite should be capitalized.

P. 4438, L. 2, L. 7: There seem to be some errors in the names of the instruments listed here. The main instrument on the ACE mission is the ACE-FTS and the acronym for SCIAMACHY is not correct. It is listed as SCanning Imaging Absorption spectroMeter for Atmospheric CHartographY on their website.

P. 4438, L. 26-27: Here it might be instructive to list the operational products and which papers correspond to them.

P. 4445, L. 2: How is "close to perfect" defined?

P. 4446, L. 16-19: This is a very complex sentence and could be split into two for clarity.

P. 4448, L. 11: "volume mixing ratios" should be VMR.

P. 4448, L. 14: This paragraph should probably be split as the discussion is for other instruments.

Sect. 3.3.1, 3.3.2, 3.3.3: It appears that the satellite and instrument names are redefined in these paragraphs.

P. 4455, L. 12: Should be "...since the satellite comparisons. . ."

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 4433, 2013.

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