Atmos. Chem. Phys. Discuss., 7, S2033–S2035, 2007
www.atmos-chem-phys-discuss.net/7/S2033/2007/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Global distributions of water vapour isotopologues retrieved from IMG/ADEOS data" *by* H. Herbin et al.

Anonymous Referee #1

Received and published: 24 May 2007

In general this is an important subject, well worth publishing in ACP. However the current treatment needs major revisions if it is to be acceptable. I recognize the difficulty of working in a second language, but the current version needs careful grammar checking for English usage. In addition I have concerns regarding the paucity of data: why only use 10 days?

The analysis is generally clear, but also quite vague. The water vapor (H2-16O) validation is very uncertain and weak. This calls into some question the rest of the results.

It would be nice to improve the global maps and show the grid used, as well as state the number of profiles. I think seasonal averages might be used to better illustrate the points.

In the end, this is a nice start, but could be so much more since the data appear to be quite useful and the topic is interesting. I would urge the authors to try to focus a bit more on the analysis and process more data.

Specific Comments:

1. Please stick to using HDO or HOD, probably HDO is better

2. The abstract and introduction have numerous grammar mistakes.

3. End of section 1: Why do you only process 10 days of data? Why does it matter that they were successive days? How much is available? If you are going to show global maps, then use more data please.

3a. How many profiles are you using?

4. For equations 7-9 I do not see how the co-variance matricies are estimated. This could use another line of explanation.

5. Figure 2 does not really show good agreement. Some profiles look good, some look bad. How many were analyzed? Also, were the soundings corrected for biases? If not, then the Upper Troposphere values are likely too dry. It would be helpful to plot these as percent differences. Also, the meridional differences are not easy to see.

6. Figure 3: it would be better to show del D and del H2-18O rather than volume mixing ratio

7. The discussion of the deuterium excess around equation 15 is awkward. I could barely follow it. Is it just a T effect?

8. There are several references (Gettelman and Webster, Webster and Heymsfield) which use only the first author, and 2 should probably be used if there are only 2 authors.

9. I did not follow the discussion at the end of section 3: are the profiles of H2O and

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the isotopologues not co-incident? Why use just every other profile?

10. Table 2 is not necessary.

11. Figures 5-7 should be plotted with some better display of how much information exists: perhaps using colored squares to explictly show the grid. You could also plot with small black symbols in at least 1 panel the locations of all the profiles (along the lines of Worden et al 2006). This would facilitate more analysis.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 4857, 2007.