

Interactive comment on “Comparison of HDO measurements from Envisat/MIPAS with observations by Odin/SMR and SCISAT/ACE-FTS” by S. Lossow et al.

Anonymous Referee #1

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General Comments:

The paper describes a new comparison of three stratospheric HDO data sets from different satellite instruments. The methods used are clearly described; proper credit is given to related work. Except for some minor technical corrections listed below the overall presentation of the paper is good. The paper fits well within the scope of AMT and may be published after some mainly minor corrections addressed below.

I have only one general comment to the paper:

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In the paper, differences between the three data sets are largest at lower altitudes (below 20 km). The error bars in Fig. 5 indicate, that the errors are also larger at lower altitudes. How large are the errors at altitudes below 18 km? Could this explain the larger deviations and/or the reduced correlations? Could some of the deviations be explained by bad statistics? Maybe errors/statistics depend on latitude and/or season? In the paper it should be made clear if the observed deviations are statistically significant.

Specific Comments:

1. p. 1681, eq. (2):
Where does the factor 2 before $[\text{H}_2\text{O}]$ come from? I would expect $\frac{[D]}{[H]} \approx \frac{[HDO]}{[H_2O]}$.
2. p. 1684/1685, 1st paragraph of section 2.1:
Can the data set in principle be continued based on the MIPAS reduced spectral resolution measurements after March 2004?
3. p. 1686, line 17:
“No smoothing has been applied to the data.”: Fig. 1 shows contour plots; to generate these usually some surface is fitted to the data (maybe internally by the plotting routine). This may also imply some smoothing.
4. p. 1691, last sentence of 1st paragraph:
“Finally the data sets were inspected visually to remove data points with totally unphysical HDO abundances that remained after the previous filtering steps.”
What is meant with “totally unphysical”? What were the criteria to remove data? Are the reasons clear why these “totally unphysical” results occurred?
5. p. 1704, line 12:
Which HITRAN version is used? Please add a reference.

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Technical Corrections:

1. p. 1684, line 10: “a into” → “into a”
2. p. 1689, line 23: “with the a” → “with a”
3. p. 1692, eq. (6):
Probably, “ $b_i =$ ” has to be removed, otherwise there is an inconsistency in notation with eq. (5).
4. p. 1701, line 11:
“The ACE-FTS profile less” → “The ACE-FTS profile is less”
5. p. 1703, line 14:
“that might an influence” → “that might have an influence”

Interactive comment on Atmos. Meas. Tech. Discuss., 4, 1677, 2011.