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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Precision validation of MIPAS-Envisat products" *by* C. Piccolo and A. Dudhia

C. Piccolo and A. Dudhia

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1. Page 912, line 7:

We agree on changing it in "ice decontamination events".

2. Page 913, line 2:

The text will be amended as suggested.

3. Page 914, line 5-8:

Same reply as point 1. of Referee #1.

4. Page 914, line 23:

Same reply as point 2.of Referee #1.

We agree, Fig. 3 is wrong. This will be fixed. The correct Fig. 3 could be found at: http://www.atm.ox.ac.uk/group/mipas/meetings/m111.html

5. Page 915, line 7

In the text we will explain what 'L1B data' is.

6. Page 916, Eq (2)

Same reply as point 6. of Referee #1.

7. Page 916, Eq (4)

We will correct the equation and state the underlying assumption that precision values are similar (which is reasonable for a particular latitude colocation within a month).

8. Page 917, line 5 (Equation not numbered)

We agree with the Referee's comment and the text will be changed accordingly.

9. Page 917, line 6

We agree with the Referee and the text will be modified accordingly.

10. Page 917, line 14

We will modify the text as suggested.

11. Page 917, line 17

We will include the suggested reference.

12. Page 918, line 1

In the text we will explain more how the E matrices have been calculated.

13. Page 918, line 4-7

Our understanding is that the E matrix takes into account the impact of the uncertainty

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in retrieved pT on the VMR retrieval at the tangent point, but does not include the further step that would be required to calculate the VMR uncertainty at pressure level assigned to the tangent point.

For example suppose the E matrix predicted a -1% error in retrieved VMR for a +1% error in retrieved pressure (as would be expected for the optically thin limit where radiance is proportional to the number of molecules). If the true tangent point pressure and VMR were 100mb and 100ppbv, but the retrieved pressure was 101mb then the retrieved VMR would be 99ppbv.

The error in the tangent point concentration is 1%, as predicted by the E matrix. However, if we then compare this 'tangent point' value with a 'true' value, we not only have this 1% error in concentration, we also have to allow for the fact that we will be comparing this value with the true concentration at 101mb instead of the tangent point pressure of 100mb. For molecules whose concentration increases with altitude, this will introduce an additional error of the opposite sign and, in the particular case of a molecule whose actual concentration at 101mb was exactly 99ppbv there would be no difference between the retrieved value and the true value.

Anyway, the sensitivity to retrieved temperature errors are much more significant than the sensitivity to retrieved pressure errors so we consider this 'pressure registration error' effect to be small by comparison.

14. Page 918, Sec. 4

The number of the sample (for a day of coincidences) for Fig. 6 is written on the top of each plot. We will include this information in the caption for this particular case. In the text we will add the number of the sample for the five days statistic.

16. Page 918, line 2

On the atmospheric variability, look at reply of point 9.4 of Referee #1.

17. Page 919, line 3,4

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We agree with the Referee's comment and the text will be modified accordingly.

18. Page 919, line 15 and ff

We also think this is a small effect, and rather difficult to explain without going into details of the retrieval algorithm.

19. Page 920, line 20

We will modify the text as suggested.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 911, 2007.