

## ***Interactive comment on “Bias determination and precision validation of ozone profiles from MIPAS-Envisat retrieved with the IMK-IAA processor” by T. Steck et al.***

### **Anonymous Referee #1**

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#### General comments:

This paper is a well written and comprehensive MIPAS ozone validation study including the estimation of retrieval precision. Comparisons are performed with co-located LIDAR, ozone sonde, microwave, FTS and satellite occultation measurements. The methodology used for the comparisons is described in detail and in particular the consideration of the temporal-spatial mismatch error is rather new and a good step in the right direction. It should also be included in future validation studies for other data sets.

I have several - mainly minor - comments, which the authors may want to consider before the paper is published.

## Specific comments:

- 1) The validation is limited to the period with high-resolution MIPAS measurements. Would you expect data of similar quality for the period after March 2004? Perhaps you can mention in the abstract that the validation is only done for the high resolution data.
- 2) It would perhaps be useful to also mention the systematic errors, random errors and accuracies (if known) of the ozone profile data sets used in the comparison. The random error variances are used to determine the variance of the random error of the difference. Was this information taken from the cited publications? I wouldn't be surprised if this is not available for all data sets used in the study. Can you please provide more detailed information on this.
- 3) Abstract, line 11: I suggest to add 'generally' to read '...are generally within 10 %', as there are a few exceptions, where the agreement is slightly worse than 10 % for stratospheric altitudes.
- 4) Section 2.3, page 4434, line 2: I don't fully understand the statement '...which makes the drawing of conclusions from the validity of new to old MIPAS data difficult.' Can you clarify this?
- 5) Section 3.2, page 4436, line 6: I don't understand what you mean by '... instead of profile validation, ...'. I'm only aware of 'profile validation studies' where the trace gas abundances are compared for different altitude separately.
- 6) Section 4.1.1, page 4438, line 2: What background atmosphere data was used to convert number density to vmr? This may also contribute to the observed differences.
- 7) Section 4.1.3, page 4440, lines 22 - 25: The excellent agreement in the 20 - 60 km partial columns surprises me a little considering that the relative differences reach 20 % at 20 km (top right panel in Fig. 5). The ozone concentration peak at Kiruna is at or below 20 km, so I would expect that the MIPAS partial column is not only 0.1 % larger than the MW partial column. Can you comment on this?

8) Section 4.3.2, page 4445, line 28: '60 nm' should be '600 nm'

9) Section 5.1.2, page 4449, line 1: I think the sentence is incomplete. I suggest to write: '... in the polar vortex region are the most probable reasons for this discrepancy.'

10) Section 5.4, page 4452, line 21: 'shows' should read 'show'

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Interactive comment on Atmos. Chem. Phys. Discuss., 7, 4427, 2007.

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