

Interactive comment on “The horizontal resolution of MIPAS” by T. von Clarmann et al.

Anonymous Referee #2

Received and published: 3 December 2008

The horizontal resolution of MIPAS

Opening Remarks

In this paper the authors have calculated the horizontal averaging kernels associated with the retrieval of trace gases with MIPAS radiance data. These averaging kernels have been analyzed for a selection of the MIPAS retrievals. This work contains some interesting results worthy of publication in a journal dedicated to Atmospheric Measurement Techniques. The presented results are specific to the MIPAS observations but as the authors point out the technique is easily adapted to any limb observations where a two-dimensional model of the observed signal is readily calculable. I would suggest this work be published with very few modifications.

General Comment

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I feel that it is not necessary to make the authors jump through significant hoops before their paper is published. The nature of this paper dictates how it should be treated. The results are very straight forward observations that arise from a simple analysis applied to the specific MIPAS viewing geometry and radiative transfer problem. The conclusions are not earth shattering and there is way, way more work that could be done along the same lines and the subsequent results could be presented in a long drawn out paper. However, I don't feel more work is necessary. I believe the authors have done the proper due diligence to ensure their results are valid so the only question is should this type of analysis be published. I found the paper well written, interesting and useful. Therefore, I vote yes. It is worthy of publication.

Specific Comments

In the abstract many trace gases are mentioned (line 10) but averaging kernels are not presented for many of these gases and I don't believe HNO₃ is mentioned at all.

On line 25-26 in the abstract it is not clear what is meant by "propagation of the horizontal smoothing ...". However, it does become clear after the paper was read.

I am a little confused about the discussion surround equations (4) and (5). I assumed that equation (4) was for a two-dimensional atmosphere where the optical properties were allowed to vary with both height and angle along the satellite track. This assumption is supported by the statement on line 4-5 on page 109 but contradicted by the statement on line 10-11 on page 108.

I found the sentence starting on line 2 page 111, "Only for H₂O ..." very confusing. I should note that this is uncommon for this paper that I found exceptionally clear way more often than not.

If the authors really want to do more work they could perform the analysis in section 4.4 while varying more than just the temperature with angle along the satellite track. They could look at typical gradients found in the trace gases as derived from either

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climatologies or models and estimate the impact of doing a one dimensional retrieval. I would find that interesting but I wouldn't require the analysis before publication.

Closing Remarks

The authors have done a good job of explaining a technique and some of its results. I have found the paper both interesting and useful and I recommend it be published with only minor revisions.

Interactive comment on Atmos. Meas. Tech. Discuss., 1, 103, 2008.

AMTD

1, S69–S71, 2008

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