**Atmospheric
Chemistry
and Physics
Discussions**

Interactive
Comment

Interactive comment on "Validation of MIPAS HNO$_3$ operational data" *by* D. Y. Wang et al.

Anonymous Referee #3

Received and published: 13 July 2007

General comments:

The paper by Wang et al. presents a comprehensive study on the validation of the operational MIPAS HNO3 product of the ESA processor. The authors compare MIPAS with a number of ground based, air, and space borne remote sensing instruments and different measurement techniques. The results suggest the high suitability of the MIPAS HNO3 data for use in geophysical studies and this is a very valuable information for the scientific community. The paper is well structured and written and it addresses sufficiently all major topics of a good publication. The paper should be published in ACP after only some minor revisions addressing the specific comments listed below.

Specific Comments

The presentation of extensive analyses in a publication is a very difficult task, especially for validation purposes. Like in many similar papers of the topic validation this paper is

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overburden by the information of different instruments, error characteristics, acronyms, and the detailed description of good agreements and discrepancies. It will be difficult to condense the manuscript, however to my mind this would improve the quality of the paper.

Introduction:

It looks to me that the authors tried to compile a complete list of satellite instruments have measured and currently measure global HNO3 data. If this is the case, I am missing the CRISTA instrument.

There are many details given on formerly validation results on HNO3. I don't think this is necessary, because they are not related later to the results of the new comprehensive study.

Section 2: Please give a short comment why you treated p/T-error as a systematic error with random variability ...

Section 4: To my mind too many details on the station analyses.

Section 5:

p5187: For arguments about the AVK it would be helpful to know the SAFIRE-A vertical resolution as well.

p5189: Which in situ measurements are addressed here as a reference for strong vertical gradients?

p5190: In the discussion of horizontal gradients of HNO3, frequently accounted for the reaon of discrepancies, it would quite helpful to know some number of typical gradients of the vortex edge by in-situ or remote sensing instruments from the literature.

Section 6.2: Is the Glatthor et al. the real reference for the ESA cloud index? Is the ESA cloud clearing not a general source of problems for all comparisons at lower altitudes?

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Conclusions:

The conclusions are too much detailed. It might help just to summarise with focus on different altitudes ranges like in Table 8 and not to bring up many of the details listed in the sections above.

Technical corrections:

p5179: Is ACP forcing to use the short cut 'Sect.' for section?

p5181: please introduce I

p5182: please introduce N as the number of pairs in the ensemble, correct?

p5186: why are just these instruments related to acronyms of institutes?

p5197, L6-9: repetition on Oxford error analysis

Figures: Some of the labels in the figures are quite small Fig. 2,5, 6 and might need improvements

Table 5: not really helpful, one should add the number of coincidences per flight

Table 7: Is the small mean miss-time for Odin and ILAS caused by the use of miss-time values with negative and positive values for the mean/std calculation? If yes, this needs correction to absolute values.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 5173, 2007.

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