Atmos. Chem. Phys. Discuss., 6, S5485–S5486, 2006
www.atmos-chem-phys-discuss.net/6/S5485/2006/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "A 3D-CTM with detailed online PSC-microphysics: analysis of the Antarctic winter 2003 by comparison with satellite observations" *by* F. Daerden et al.

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Received and published: 18 December 2006

Interactive comment on G. Stiller

We are grateful to G. Stiller for her comment on the paper regarding the enhanced HNO_3 concentrations in the polar vortex. Although we had become aware of this problem independently after submission of the paper, her interactive comment led to a full appreciation of what was happening, and was therefore highly appreciated.

As already mentioned in our answer to referee 1, the 3D CTM indeed has no description of NO_x creating processes in the mesosphere and lower thermosphere (MLT). As a consequence the model does not reproduce the second HNO_3 maximum. This maximum descends down to the top levels presented in the paper (525K-575K) only

from mid-July onwards. But as can be seen from figure 6 the model already underestimates the MIPAS HNO_3 values from early June onwards. This early underestimation is likely due to the problems with the background aerosol and PSC formation at these levels, where due to a poor background aerosol initialization the model overestimates the extinction and removes too much nitric acid (see comment to referee 1).

With the information provided by G. Stiller we now can assume that the deviation between model and observations from mid-July onwards is mainly controlled by the downward transport of the second HNO_3 maximum. Indeed the differences between the model and MIPAS during this period and at the 575K level are $\sim$5ppbv, comparable to the values reported by Stiller et al [2005].

With permission, we will include G. Stiller's comments in the paper with the relevant references and an acknowledgement.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 8511, 2006.

ACPD

6, S5485–S5486, 2006