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Atmospheric Measurement Techniques Discussions

Interactive comment on "Retrieval of temperature, H_2O, O_3, HNO_3, CH_4, N_2O, $ClONO_2$ and ClO from MIPAS reduced resolution nominal mode limb emission measurements" *by* T. von Clarmann et al.

Anonymous Referee #2

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General Comments

The paper discusses the retrieval products for temperature, H2O, O3, HNO3, CH4, N2O, ClONO2 and ClO from MIPAS reduced resolution nominal mode limb emission measurements. It is written in a very systematic way: for each parameter, the authors give in the same order the selection of retrieval windows and spectroscopic database, the retrieval regularization choice, the resulting error budget, and the achieved vertical and horizontal resolution. They always compare to the retrieval characteristics of the high resolution mode and/or the so-called reduced resolution UTLS1 mode. In the end, per parameter, the authors show a retrieval result (a latitude dependent, zonally

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averaged, or altitude dependent latitudinally averaged, time series). The paper is very technical, but it is an extremely useful reference for any later use of the MIPAS reduced resolution nominal mode products. As said above, the structure is very systematic and clear; the text is concise but very precise and complete. It contains a lot of information also in the Tables and Figures.

Specific Comments

- It is confusing to have 'nominal mode retrievals' in the headers of Tables 1a to c. To my understanding, the authors point to the reduced resolution nominal mode, and I think that it is useful to write this out fully, in order to avoid any confusion with the high resolution nominal mode.

- It would be good to state from the beginning that the 410 km spacing between successive limb sequences (Section 2 Measurements) is afterwards referred to as the 'horizontal sampling'.

- Section 3.1, last paragraph: why is non-LTE not included in the present retrievals ? I understand that the analysis microwindows have been optimized to exclude non-LTE effects, but why has this option been taken, rather than to include it as was done previously?

- Section 3.5.2, line 16: 'the maximum values' of the averaging kernel matrix ? Please specify which maximum values you are talking about to make sure that the reader understands.

- Section 3.5.3, last line: I don't understand the 'about 12 than 6 km' example. Do the authors mean '12 rather than 6 km' ?

- Section 4, beforelast par., line 14: please explain better the aliasing problem.

- Table 4: what is the reference for tp? I.e., it is not clear what tp=0 represents ?

- Tables 5 to 11: to calculate the error contributions in percentage values, what are the

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reference values at each altitude?

- Figure 12: Can the authors comment on the very sharp features in winter/early spring between 40 and 50 km altitude ? Why are they so sharp in time ?

Technical Comments

- Sometimes the authors write UTLS1 mode, sometimes UTLS-1: please use the same typography everywhere.

- Section 4, line 10: 'integration above wavenumber': do the authors mean ' integration over wavenumber' ?

- Section 4, line 22 and Section 6, line 14: delete 'the' in front of 'scratch'.

- Section 5, pg. 196, last line: should be 'at this altitude' instead of 'in this altitude'.

Interactive comment on Atmos. Meas. Tech. Discuss., 2, 181, 2009.