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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Global stratospheric hydrogen peroxide distribution from MIPAS-Envisat full resolution spectra compared to KASIMA model results" *by* S. Versick et al.

Anonymous Referee #1

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General comments

The manuscript by Versick et al. presents stratospheric H2O2 distribution from MIPAS full resolution mission. The H2O2 retrieval is challenging, due to a very low signal-to-noise ratio. Even if the signal never exceeds the noise level it is possible to extract information from the spectra by averaging an appropriate number of values. The outcome of the analysis is compared to balloon-borne, to previous MIPAS measurements and to the KASIMA CTM outputs. A previous analysis performed in 2005 already reported on H2O2 retrieval from MIPAS full resolution spectra, however this paper performs the analysis with a different retrieval approach and adds some information (e.g.

the explanation of day/night differences with the diurnal cycle). The paper is clearly written in good English. The paper is appropriate for ACP and could be published after addressing the points reported below.

Specific comments

- P 33516, L 19: Looking at Fig. 1 it seems that some microwindows are too narrows to be considered microwindows (even if it is a bit hard to see details from this figure), they rather seem almost "individual spectral points". My concern here is how can you correctly reproduce the spectral line shape inside these so narrow microwindows? Il could be helpful to add a table with the microwindows boundaries.

- P 33517, L 19: Could you provide a statistic of occurrence of these convergence problems?

- P 33518, L 3: What is the main cause of instability of a retrieval below 20 km: too many cloudy spectra, or maybe too high systematic errors? Does this happens at every latitude and/or period of the year? Could you please comment on that.

- P 33519, L 14: I have a comment on the sentence "retrieval of the logarithm of volume mixing ratio. . .would produce a positive bias in case of averaging". The authors are right to say that it is possible to generate a bias when retrieving log(vmr) instead of vmr. However it seems that in the cited paper the bias is not so evident. It can be noticed (e.g. from its fig.5) that there are regions where the averaged vmr is at least lower than 0.03 ppbv, so the bias should not be greater than this value. This should be mentioned in the paper.

-P 33524, L2: have you got some indications to explain the high difference between MIPAS and the model around pole regions?

- Fig 4: what does the title "error budget for 25" means?

- Fig 5: the meaning of the lines colour is not explained in the caption.

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Technical corrections

- Fig 2: for uniformity with the other figures, the units of measure should be placed between square brackets.

- Fig 6: “30° N and 40° N zonal means”: does it mean that the curve is the “zonal mean of measurements from 30° to 40° N”? Also, for uniformity with the other figures, the units of measure should be placed between square brackets.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 33511, 2011.

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Interactive Comment