

Interactive comment on “Observation of unusual chlorine activation by ground-based infrared and microwave spectroscopy in the late Arctic winter 2000/01” by T. Blumenstock et al.

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Final response

We thank the Referees for their comments and the helpful discussion.

Response to comments by Referee #2

Following the suggestion of Referee #2 mean column amounts and standard deviations of microwave, FTIR and model data are added in the revised paper.

Response to comments by Referee #3

A section devoted to the accuracy of the observations is added. Since ClO can be

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detected and retrieved in day - night difference microwave spectra errors for this especially robust kind of retrieval are added to the paper, too. The error in the retrieval of difference spectra is 0.2 ppbv. Error bars are added in Fig. 6. Error due to temperature is included in the error bars and their discussion.

The vertical resolution can be estimated as full width at half maximum of the averaging kernels which is about 10 km. Nevertheless subsidence of a few km can be detected by this method as has been demonstrated in case of subsidence within the polar vortex (Bremer et al., JGR, 2002; Kopp et al., JGR, 2003) or in case of an error in height assignment of MIPAS data (Blumenstock et al., ESA-Report, 2003).

At the end of the introduction (page 9995, lines 3-7) mixing processes are meant with related processes. These sentences have been rephrased.

It is certainly true that chlorine activation on non-PSC particles might be quite complicated and that known reactions show decreasing gamma coefficients with increasing temperature. On the other hand, the observation gives rise to the suspicion that there might be an unknown reaction channel which has not been investigated in detail so far.

Line 1 on page 10000 has been moved to chapter 2 (instrument description). 'The' has been added in line 18, page 9995.

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