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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Evidence for heterogeneous chlorine activation in the tropical UTLS" *by* M. von Hobe et al.

Anonymous Referee #1

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1 General Comments

The paper on chlorine activation in the tropical UTLS presents novel observations and model studies and is worth to be published in ACP after some revision. The sensitivity studies point to the need for further research on the interactions of halogens with NOx and ozone in the UTLS and the impact of convection on halogen sources.

2 Specific Comments

Seasalt as a source for tropospheric chlorine might also play a role in regions with strong convection. This is mentioned on page 18076 but it should go also into the introduction (e.g. page 18066). The discussion on that should be expanded. On the last IGAC-conference were several contributions pointing to $ClNO_2$ as important heterogeneous intermediate. The fact that during SCOUT-O3, at a site strongly influenced by marine air, the chlorine concentration was larger than at TROCCINOX (more continental) points also to some influence of seasalt.

CFC-data (e.g. for CFC-11) of the HAGAR-instrument on the Geophysica by M. Volk are available for both campaigns in contrast to the statement on page 18070. I had not the impression that these data are so bad that they cannot be used. I don't believe that the two-staged correlation to ozone with the large scatter of HCl (Figure 1) used in the paper is better. It is somehow a contradiction to claim that the time resolution of organic chlorine data is not sufficient, but to base the correlation of HCl and Cly on a climatology. If the CFC-data are not included in a figure, at least some discussion in the text is needed.

The observation of high ClO at night (page 18076, line 22) is not enough explained or discussed later in the text (e.g. page 18077, 18080). A fast formation of Cl_2O_2 should be expected.

3 Technical

Page 18068, line 10: Give numbers also as volume mixing ratio for typical UTLS conditions.

Page 18079, line 6, 8: Eqn. 9 or R9? Also in line 17 should be (R10).

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Page 18090 and Fig. 1: Introduce 3rd panel with Cly/O_3 and/or Cly/CFC-11.

Page 18091: Include colors in caption.

Page 18093, Fig. 4: A colorscale with less steps would be better to distinguish points, a logarithmic scale for O_3 might be better.

Page 18094: Use full color scheme and logarithmic O_3 scale, the figure is very difficult to read.

Page 18095: Meaning of the numbers at upper right edge of middle and lower panels?

Page 18097: Caption: As Fig 7 but...

Page 18099, Fig. 10: The figure is interesting but difficult to read. Refer to text in caption.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 18063, 2010.