Atmospheric
Chemistry
and Physics
Discussions

Interactive comment on "Chlorine partitioning in the lowermost Arctic vortex during the cold winter 2015/2016" *by* Andreas Marsing et al.

Anonymous Referee #1

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The paper by Marsing et al. on chlorine partitioning is clearly within the scope of ACP. The paper is well structured and written, and I do not have much to criticize with respect to its scientific content. Existing work in this research field is adequately referenced. I suggest publication in ACP after consideration of the few minor comments listed below.

p3 l6: Is the term "chemical gradient" established technical language or slang? I would prefer something like "concentration gradients"

p5 l10-12: I suggest to expand somewhat on error estimation. How are the uncertainties estimated? From a statistical analysis of the data or by propagating known ingoing uncertainties through the system? If errors come from a statistical analysis, how are the systematic components estimated? Which error sources have been considered? etc.

p5 l11: The term "accuracy" is notoriously ambiguous. Often it is understood as an estimated of the combined random and systematic error, but equally often it is understood as the systematic part alone. One can even find official documents (GUM, ISO and others) which use contradicting definitions of accuracy. I suggest to avoid this term and to use "estimated total uncertainty" or "estimated systematic uncertainty" instead.

p6 l21: Using model output from 12:00 UTC only and interpolate data to other locations and times could cause problems in the case of a diurnal cycle. At the altitudes of interest, the diurnal cycle of ClONO2 is not very large but since this is a key condition for the applicability of this method, this assumtion should be explicitly stated.

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2019-370, 2019.