

The revised manuscript has carefully addressed my questions raised in the 1st round comment. Basically, I am happy with their responses, even though they did go further on the issue regarding the role of bromine on HNO₃ formation (e.g. via BrONO₂ hydrolysis reaction). Anyway, I agree with their argument that this issue is slightly out of the scope of this current paper.

In general, the revised paper has made some changes according to all the three reviewers comments, e.g. with a new table being added to address the issue raised by reviewer #3 on the ionic balance of aerosols at Concordia, which is very helpful. The added texts and discussions regarding, for example, the HOBr effect on the chlorine depletion, the anthropogenic and volcanic contribution to sulphate formation in polar regions, as well as the back-trajectory results, all well improve the quality of the manuscript and strengthen their conclusions derived. Thus, as I concluded in my first round review, I again recommend this manuscript to be accepted for publication after just a few technical corrections (as shown below).

Technical corrections:

In the text, both 'asl' and 'agl' are used. Would it be better to stick on one term? Also the 'asl' (at its first appearance on P3L30) was not even defined; while the 'agl' was defined twice (at P4L33 and P10L11).

I noticed that in most figures sub-/super-scripts are not properly applied for chemical species and ions. For example, in Fig. 4d, Na⁺ is used instead of Na⁺; NO₃⁻ is used instead of NO₃⁻. Similar issues are also spotted in fig. 3, 5 and 6. In particular, in fig. 8 and 9, SO₄^{- -} is used, which looks quite strange. All these should be corrected before publication.