

Response to Review #1

The authors like to thank Reviewer #1 for revising our manuscript again. In the following, we address the issues raised by Reviewer #1.

Q1.1: Nevertheless, the entire manuscript would largely benefit from a careful proof-reading by a native English speaker since it still suffers from some oversimplified representations of complex processes, a number of misleading formulations, and in some places from confusing or imprecise expressions. Here are just three examples from the introduction:

L. 16 "... protecting the lives on the earth." Whose lives? It appears that a number of complex processes in the Earth system are summarized in just this one sentence.

L. 17f: Maybe better to write "At high concentrations it causes eye irritations and disorders of the lung function of human beings (Lippmann, 1991)."?

L20f: Not clear to me how vertical convection itself can be a source of tropospheric ozone since it just moves tropospheric ozone from one location to another?

A1.1: Thanks a lot. We have revised our manuscript again and made the corresponding changes according to the suggestion. Typesetting and language copy-editing will also be performed by the Copernicus Publications editorial office during the production of this paper.

Q1.2: Well before Bottenheim et al. 2009, it was for example shown by Kaleschke et al. 2006 and Jacobi et al. 2006 that bromine release and the depletion of tropospheric ozone can be related to new ice formation.

Kaleschke, L., et al., Frost flowers on sea ice as a source of sea salt and their influence on tropospheric halogen chemistry, *Geophys.Res.Lett.* 31, L16114, doi: 10.1029/2004GL020655, 2004.

Jacobi, H.-W., et al., Observation of a fast ozone loss in the marginal ice zone of the Arctic Ocean, *J.Geophys.Res.* 111, D15309, doi: 10.1029/2005JD006715, 2006.

A1.2: Thanks for the recommendation of references. We have added these two references and the related discussions into the revised manuscript. Please see **lines 71-74** in the revised manuscript.

Q1.3: Since the manuscript deals with tropospheric and stratospheric ozone, which is still easily confounded, the authors should carefully indicate throughout the manuscript if they talk about tropospheric or stratospheric ozone.

A1.3: Thanks for the suggestion. We indicated them more clearly in the revised manuscript.