



UNIVERSITY
OF COLOGNE

University of Cologne · Albertus-Magnus-Platz · 50923 Köln

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Atmospheric Physics and Chemistry
Editor Ivy Tan

**Faculty of Mathematics
and Natural Sciences**

**Institute for Geophysics and
Meteorology**

Fiona Paulus
fpaulus@uni-koeln.de

Cologne, August 21, 2026

**Answer Letter to Review Comments for the Manuscript
"Impacts of mesoscale atmospheric subsidence on
cloud glaciation and decoupling in Arctic marine cold
air outbreaks"**

Dear Ivy,

We sincerely thank the reviewers for their review of our manuscript. We are pleased to submit the revised version of our manuscript, "Impacts of mesoscale atmospheric subsidence on cloud glaciation and decoupling in Arctic marine cold air outbreaks", which has been revised in response to the reviewers' comments. Detailed point-by-point responses to all comments are provided below.

Line 70: Is there a space missing between "HALO-(AC)3" and "campaign"?

Thank you for the comment, it has been changed.

Line 107: can remove "of the flow" as it is redundant with saying "downstream". It is confusing that the cloud streets are described as breaking up with cloud fraction increasing. I typically associate breakup with a decreasing cloud fraction. Perhaps the wording is a little unclear.

Thank you for the comment, the sentences was clarified.

Line 128: was -> were

Done.

Line 160-161: The definition of the IWV and LWP acronyms should be in parenthesis

Done.

Line 165: I'm not familiar with the term "interchangability"? Uncertainty?

Thank you for pointing this out. Here, interchangeability refers to the manufacturer-specified interchangeability of the temperature sensor, i.e. the specified tolerance associated with differences in the sensor response relative to the nominal sensor characteristic. We use this term intentionally because it is the terminology provided in the sensor specifications.

Line 377: There are numerous locations in the manuscript with redundant acronyms such as "Figure 7 (b) compares the simulated liquid water path LWP against two measurements."

Thank you for this comment, the manuscript has been checked and redundant definitions were resolved.

Line 624: Is there a space missing after "HALO-(AC)3" and a missing period?

Done.

In addition, the notation of the potential temperature ϑ and the spherical coordinate θ was clarified and a small inconsistency in Table 1 with the platform of the AMALi instrument was corrected.

We look forward to continuing the discussion and would be happy to address any further comments or questions arising from this revised version.

Sincerely,

Fiona Paulus