

## Introduction

We thank referee #2 for his/her careful reading, comments and suggestions which we address in the following. The authors' answers are printed in italics:

*Remark: The figure and page numbers in the referee comments are corresponding to the original manuscript. If not stated otherwise, figure and equation numbers in the authors' answers are referring to the revised, marked-up manuscript version (showing the changes made).*

“The Authors discuss the use of passive measurements in the shortwave infrared to provide radiative closure to synergistic retrievals of cirrus cloud microphysical properties utilizing co-located airborne lidar and radar measurements. They discuss two test cases, one where passive measurements show evidence of a good radiative closure and one where they do not. For the latter case, they use co-located in situ observations to relate the lack of radiative closure to an exceptionally high ice crystal number concentration at an altitude of about 7.5 km, which poses challenges to both lidar and radar retrievals.

Overall, I found this paper very interesting and clearly written, and therefore I recommend publication with only minor technical corrections. Specific comments are below:”

→ *Thank you very much for your time and effort in compiling this review! We performed all grammatical corrections suggested by the reviewers and revised the mentioned areas to improve their readability and clarity. At the end of this text you will find a detailed track change for the revised manuscript.*

## Minor technical corrections

- “Abstract, L19-20. The last sentence was not immediately clear to me when I first read the paper. You may want to replace “narrow” with “attribute” or “relate”.”

→ *Thanks for this suggestion. As this sentence was also flagged by referee #1, we adopted their wording: “In this case, collocated in-situ measurements indicate that the lack of closure may be linked to unexpectedly high values of the ice crystal number density.”*

– “P2, L56. Do you actually mean “overlapping radar and lidar measurements”?”

→ *Yes, we actually mean the region where radar and lidar data overlap, e.g. the lidar is not yet attenuated while the radar is already sensitive enough. Since the term “overlap” could be confused with the term “lidar overlap”, we explain this term now explicitly.*

*P2, L56 now reads:*

*These methods were, however, only applicable to the overlap region where the lidar signal is not yet attenuated but cloud particles are already large enough to be detected by a cloud radar.*

– “P5, Section 2.1. At what altitudes did the aircrafts fly?”

→ *We describe the altitudes and flight patterns in the second paragraph in section “3.2 Case 2: Occluded front clouds”:*

*While HALO and the SAFIRE Falcon flew over the cloud layer at an altitude of 13.5km and 11km respectively, the FAAM BAe-146 performed a profiling flight pattern within the radar-lidar curtain.*

*The BAe-146 profile pattern is shown in Fig. 8d.*

– “P5, L127, “aircraft” -> “aircrafts””

→ *Are you sure about this plural form? We consulted multiple dictionaries which state that “aircraft” does not have a plural form.*

- “P6, L151, “spectroradiometer” -> “spectroradiometers””

→ *Ok. Changed this to your suggestion.*

- “P7, P179, consider replacing “convergence with the actual measurements” with “convergence of the simulated measurements to the actual ones””

→ *Thanks for this suggestion. Your wording is more natural.*

- “P10, L243, “missing” -> “lack of””

→ *You are correct, “lack of” is more appropriate here.*

- “P10, L244, “can be reflected by all atmospheric constituents” -> “can also be reflected by liquid water clouds and aerosols”.”

→ *Thanks, we adopted your more descriptive wording.*

- “P18, last line. Do you mean Fig. 9d instead of 9c?”

→ *Thats correct, thanks for spotting this typo!*