

# ***Interactive comment on “Assessing the vertical structure of Arctic aerosols using tethered-balloon-borne measurements” by Jessie M. Creamean et al.***

## **Anonymous Referee #1**

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### General comments:

The authors presented detailed analysis on aerosol vertical structure over the Arctic regions with data from a tethered balloon system. The representativeness of the ground aerosol measurements when applying to the vertical column below clouds is studied. I find this a very interesting read. I commend the authors for doing a great job in the structure and logic flow of the paper. The analysis revealed a lot of interesting details about aerosol vertical structure over the region. The paper is of great interest to the community. I recommend publication after a few minor revisions listed below.

### Specific comments:

P2, bottom paragraph: “no data available north of 82 degree”, you probably meant for CALIPSO. Please point that out that explicitly. Also it’s worth mentioning that the ICESat-2 mission can reach 88 degree north, although ICESat-2 measurements probably have less information content than CALIPSO on aerosol observations.

P6, the last line: by “AOS”, do you mean “AOSMET”?

P9, Line 265: the claim “in general, high (low) concentrations corresponded to smaller (larger) sizes of particles” is hard to see by eyeballing. I agree that for the profiles 260-280 this indeed is the case, but not for all the profiles. It would be helpful to show an anticorrelation plot.

P11, Line 331: why do you call the mixed layer “cloud-driven”?

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Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2020-989>, 2020.

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