We thank Reviewer 1 for his/her constructive comments. We reproduce reviewer's comments in *blue* and our responses in black.

Line 39: Remove "the" after "precipitation in".

Suggested change has been made (line 40).

Line 40: Replace "remaining" with "existing".

Suggested change has been made (line 40).

Line 42: "nucleation mechanisms at work" sounds a bit awkward.

The term "nucleation mechanisms at work" has been changed to "nucleation mechanisms" (line 42).

Line 44: "supercooled" or "supersaturated"?

We replaced "supercooled" by "metastable" (line 44).

Line 52: Replace "at work" with "to take place".

Suggested change has been made (line 54).

Line 72: Add a reference after "efficiency".

"Kaufmann, L., Marcolli, C., Hofer, J., Pinti, V., Hoyle, C. R., and Peter, T.: Ice nucleation efficiency of natural dust samples in the immersion mode, Atmos. Chem. Phys., 16, 11177-11206, doi:10.5194/acp-16-11177-2016, 2016" has been added as a reference after "efficiency".

Line 73: Define "cloud glaciation". Why is this relevant for the manuscript?

We mean with "cloud glaciation" the transformation of cloud droplets to ice crystals. To understand cloud glaciation, the role of atmospheric processing on the IN efficiency of INPs such as microcline needs to be understood.

Line 89: Replace "differential scanning calorimetry" with "DSC".

This is the first mentioning of DSC in the main text, therefore, we want to state the full expression here. We add DSC in brackets in the revised manuscript (line 96).

*Line 95: Replace "*Nannochloris atomus and Thalassiosira pseudonana*" with "Nannochloris atomus and Thalassiosira pseudonana".*

Suggested change has been made (line 102).

Line 96: Remove "dust" after "illite".

Suggested change has been made (line 103).

Line 108: Replace "differential scanning calorimetry" with "DSC".

Suggested change has been made (line 117).

Lines 125-126: "Evaluation" of what?

Lines 125-126 of the discussion paper have been modified to "We ran the second freezing cycle at 1 K min^{-1} cooling rate and used it for evaluation of freezing temperature (T_{het} and T_{hom}) and heterogeneously frozen fraction (F_{het}) as discussed below." (lines 152-154). The evaluation of these parameters are discussed in the next paragraph.

Lines 171-172: "The first signal observed at higher temperature is due to heterogeneous freezing triggered by microcline particles while the second freezing signal at lower temperature is due to homogeneous freezing." This was already mentioned above.

This sentence has been removed from the revised manuscript.

Lines 376-377: "is to large extent reversible" sounds a bit awkward.

The part "is to large extent reversible" has been modified to "largely reversible" (line 434).

Line 401: "minor contributions" on what?

To improve the formulation, we write in the revised manuscript "the minor contributions of feldspars to atmospheric dust aerosols" (line 449).

Line 403: Replace "superior" with something more appropriate.

The term "superior" is replaced by "high" in the revised manuscript.

Line 424: "atmospheric solution droplets by means of Fig. 9" sounds a bit awkward.

We reformulate in the revised manuscript: "atmospheric solution droplets following atmospheric air parcel trajectories P1 through P3 (red and yellow arrows) with increasing moisture (as shown in Fig. 9)." (lines 471-473)

Line 438: Remove "temperature" after "lower".

Suggested change has been made.

Line 444: Remove "the" before "nucleation".

Suggested change has been made.

Line 464: Replace "ice nucleation" with "IN".

Suggested change has been made.

Line 471: Replace "creation" with something more appropriate.

The term "creation" has been replaced by "emergence" in the revised manuscript (line 520).

Line 483: Replace "ice nucleation" with "IN".

Suggested change has been made.

Line 624: Correct the volume and page number.

Necessary corrections have been made in the revised manuscript. “n/a-n/a” has been removed from the reference (line 684).

Line 822: Use the short name of the journal for consistency.

Journal name “Environmental Earth Sciences” has been abbreviated to “Environ. Earth Sci.” in the revised manuscript (line 898-899).

Figure 5: The readability of this figure is very low. Could the authors add and insert with a zoom of the figure down to aw of .99 or .98 to better visualize the data? Or can the authors present the data of this figure in a Table in the Appendix?

All data for Figure 5 (as well as Figs. 3 and 7) are presented in a tabular form at the following DOI: *10.3929/ethz-b-000229892* and has been mentioned in “*Section 7. Data availability*”.