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## Comment on acp-2021-1072

Britta Schäfer et al.

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Author comment on "Observations of cold-cloud properties in the Norwegian Arctic using ground-based and spaceborne lidar" by Britta Schäfer et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-1072-AC3>, 2022

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Dear editor and reviewers,

thanks again for your work reviewing our manuscript.

Regarding the last comment to the tropopause definition: Hereby we confirm that we followed the correct tropopause definition by the World Meteorological Organization 1957 with the two criteria and this is made more explicit in the text. The new text is (page 9, line 216-220 in final manuscript):

"According to the World Meteorological Organization (1957) the tropopause is defined as the lowest level at which the lapse rate decreases to  $2 \text{ K km}^{-1}$  or less and where the average lapse rate between this level and all higher levels within 2km does not exceed  $2 \text{ K km}^{-1}$ . Applying this definition, we estimate the beginning of the tropopause to be located at about 11.0km (from radiosonde, see Fig. 2d) or 10.6km (from reanalysis data) and at a temperature of  $-70^\circ\text{C}$ . Thus, the cirrus cloud is extending well into the tropopause, [...]"