

Review of Revised Manuscript acp-2022-401-v3

I would like to thank the authors for their detailed replies to the referee's comments. Overall, the authors have addressed most of my concerns and the revised manuscript is significantly improved over the previous version. I do not have any major concerns with the revised manuscript, but there are a few minor points that should be addressed before final publication.

Minor Comments:

Line 8: CALIOP acronym should be defined in the Abstract.

Line 26: "... variations in account..." should be "...variations into account..."

Line 34: suggestion replacing "..., which role..." with "..., whose role..."

Equations 1-5: Suggest defining all the individual symbols for parallel and perpendicular aerosol/particulate backscatter, etc. Could just include them in the sentences where they are mentioned.

Line 126: "tropopause" do you mean "troposphere"?

Lines 130-131. PSCs may occur above 28 km- would this affect the clear-air reference calculation and calibration?

Line 210: "et" should be "and" ?

Line 222: "As mentioned in introduction..." should be "As mentioned in the introduction..."

Line 336: "... do not directly provides the PSC types distribution..." should be "... does not directly provide the PSC type distribution..."

Figure 5: The distributions shown for P18 over DDU are not consistent with Fig.12 in Pitts et al. (2018) where the 12-year statistics for the entire Antarctic region show STS occurring near T_{STS} and Ice occurring near T_{ice} . Can you explain this apparent discrepancy?

Figure 5 caption: Sentence formatting needs fixed.

Figure 9: The black triangles are the CALIOP PSC days over DDU, correct? If yes, then they should be defined in the caption. It is surprising that CALIOP would have such a small number of PSC days. Is this based on a 100-km match distance? Why do you think the number is so small?