

Atmos. Chem. Phys. Discuss., referee comment RC1
<https://doi.org/10.5194/acp-2022-602-RC1>, 2022
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Comment on acp-2022-602

Anonymous Referee #1

Referee comment on "Composition and mixing state of Arctic aerosol and cloud residual particles from long-term single-particle observations at Zeppelin Observatory, Svalbard" by Kouji Adachi et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2022-602-RC1>, 2022

Adachi et al. - Composition and mixing state of Arctic aerosol and cloud residual particles from long-term single-particle observations at Zeppelin Observatory, Svalbard.

As pointed out by the authors themselves right from the title and the introduction, this manuscript basically describes aerosol and cloud residual particle composition of background air over five years of sampling/measurements at the Zeppelin Observatory near Ny-Alesund. The great merit of the paper is, undoubtedly, that of providing, for the first time, long-term data and observations on aerosol and cloud residual particle properties and variability. This opens the horizons of understanding the processes underlying cloud chemistry and microphysics.

However, I believe that the quantitative observations reported and described in the results section deserves to be discussed more organically than in paragraph 3.3 (lines 292-305) and, in part, in paragraphs 3.2 and 3.4. The best would be to dedicate separate paragraphs to discussing the points that emerge in the previous ones - something like what you did in paragraph 3.5. This would provide a much clearer picture and a more direct link to the research perspectives reported in the final section.

Apart from this, it is good paper, well written and conceived in a clear and progressive way of explaining the topics little by little and in successive steps so that the questions that arise spontaneously in the reader can get their answer.