

Atmos. Chem. Phys. Discuss., referee comment RC2
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Comment on acp-2021-761

Anonymous Referee #2

Referee comment on "Identifying chemical aerosol signatures using optical suborbital observations: how much can optical properties tell us about aerosol composition?" by Meloë S. F. Kacenenbogen et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-761-RC2>, 2021

The authors identified different species of chemical air mass aerosol types by using measurements of aerosol optical parameters. This study is overall well designed and the results are well presented. However, this manuscript looks more like a technical report, especially the abstract, introduction, and way to present the results. I agree with reviewer 1 that this article is more suitable for AMT instead of ACP. I suggest transferring the paper to AMT and making major changes before it can be accepted for publication.

The authors are suggested to rewrite the Introduction and Method in a more professional way instead of listing everything one by one.

Some paragraphs can be merged.

Please also highlight the novelty and differences with previous related studies in the Introduction.

Many abbreviations need to give their full names where they first appear in the text, e.g., US EPA, SO₂, NO₂, O₃, CO,

There are too many academic terms in the manuscript and it is suggested to add a table to summarize all acronyms and full names.

The Figures can be improved, e.g.,

Figure 2: Better to present using the Flowchart

Figure 7: Add (a) to (c) for each subfigure

Figure 8: Add the legend for lines with different colors

I suggest that the author can compare their results with satellite- and ground-based observations since there are aerosol optical properties and composition products and measurements available in the US.