

Atmos. Chem. Phys. Discuss., referee comment RC2
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Comment on acp-2021-1063

Farahnaz Khosrawi (Referee)

Referee comment on "Investigation of new particle formation mechanisms and aerosol processes at Marambio Station, Antarctic Peninsula" by Lauriane L. J. Quéléver et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-1063-RC2>, 2022

Editor review on the paper "Investigations of New Particle Formation mechanisms and aerosol processes at the Marambio Station, Antarctic Peninsula" by Quéléver et al.

Since the second referee report is still missing, I will provide a review so that the open discussion can be closed. Quéléver et al. present an extensive study on new particle formation using data derived during a measurement campaign at Marambio station in 2018. The paper is generally well written and I only have suggestions for minor revisions.

Generally:

For the next submission it would be good if you could use the ACP manuscript style (line spacing, font size etc. See templates on the ACP webpage: <https://www.atmospheric-chemistry-and-physics.net/submission.html#manuscriptcomposition>). The manuscript was as it was published as preprint quite difficult to read (e.g. too small font).

Line numbering: On the first few pages you start numbering again with each page, but the second half of the manuscript the numbering continues until the end. Should be done one or the other way, but not mixed. Also here I would suggest to check the ACP guidelines which is the correct style.

Specific comments:

Abstract: The abstract is quite long and my impression is that you go between L36 and

L41 too much into detail. I am not sure if it is really necessary to list here all the numbers. I would suggest to rather do that in the summary and shorten these lines here in the abstract.

P3, L21: "sufficiently away from the station.....". Add here why. I assume it's to avoid that the measurements are affected by the station. Would be good to clearly state this.

P5, L12: Add here "by collision and coalescence", so that it reads "are lost to pre-existing particles by collision and coalescence" to be more precise.

P5, L24: Also here I would suggest to add bit more information. How accurate is the approach by Kulmala et al. (2022)?

P7, L28: Why these numbers? Why do you pick these size ranges? An explanation/justification is missing.

P8, L10-11: Sentence not clear. Please rephrase.

P13, Fig. 6 and according text: This kind of analyses is new for me and I could not follow what actually the mass defect is and would you try to extract from it. Some more motivation/explanations are required.

P14, L116: I have difficulties to follow you. To what is the "high intensity" referring to?

P14, L133: orange dots? To which figure are you referring to? Figure 6?

P14, L140: Yellow and green dots? Same here. To which figure are you referring to?

P14, L143-147: Sentence not clear. Please rephrase. Maybe it's better to split this sentence into two and check the grammar.

P15, L162: Add "aerosols" so that it reads "sea salt aerosols"?

Technical corrections:

P2, L4: Ipcc □ IPCC

P2, L5: Add a reference?

P2, L28ff: To my knowledge this are not the only references on these aerosol compositions, thus I would suggest to add "e.g." before the references.

P3, L1-10: I would suggest to add here references to the respective chapters.

P5, L49: aera □ area

P7, Fig 2 caption: here "a)" etc in bold face instead of "(a)" as normal text. Be consistent and check ACP guidelines for which way of writing should be used.

P7, L23: changed □ changes

P7, L25: appear □ appeared

P8, L33: particle □ particles

P11, L39: concentration □ concentrations

P11, L42: add "is" so that it reads "that IA is even anticorrelated with....."

P11, L46: concentration □ concentrations

P11, L47: concentration □ concentrations

P11, 3.3.2 Header: Study case of □ case study on

P13, L104: noise to signal □ signal to noise

P14, L124: rate □ rates

P14, L134: Add "the" □ have shown **the** possible roles

P15, L192: Add "the" □ in **the** Supplementary

P16, L213: concentration □ concentrations

P17, L221: emission □ emissions

P17, L236: study case □ case study

P17, L238: pathway proceeds □ pathways proceeds

P17, L240: than negative □ than the negative

P17, L241: should □ could

P17, L246: in CLOUD-chamber CERN □ in **the** CLOUD-chamber CERN

P17, L247: Add "that" and use plural: indicate **that** very high concentrations

P18, L299: in turns □ in turn

P18, L299: source □ sources

P18, L308: "by key well known"? "key" obsolete?