

ACP-2021-182: “Technical note: sea salt interference with black carbon quantification in snow samples using the Single Particle Soot Photometer”

We would like to thank the referees for their detailed and constructive comments, which helped us to improve our manuscript. While the referee comments are given in **black bold**, our answers are given below in **blue letters**. Additionally, we added the changes made in the revised manuscript in **blue bold** letters.

Answers of the authors to anonymous Reviewer#1

This paper is clearly written and presented. It presents important findings and useful information for anyone using an SP2 to measure rBC in snow or ice samples collected from environments where the samples could contain salt. My only comment is to note a few places where I suggest edits or where corrections are needed. Following the recommendation of the reviewer, we carefully revised the manuscript to improve its readability. The specific comments are addressed as follows. Note that an error was found in the section list. The “result section” now is labelled as Section 3 rather than 2.3.

Overall, the paper could use a very light edit for English, but this is very minor.
The paper underwent English polishing by a native speaker.

Suggestion: In the title, capitalize Single Particle Soot Photometer, since it is a specific instrument.
The text was modified following the reviewer’s comment.

Suggestion: Lines 90-92: "At the present time, the potential interference of sea salt during the analysis of rBC particles with the SP2 is not yet assessed." I would edit this to "Until now, the potential interference of sea salt during the analysis of rBC particles with the SP2 has not been assessed.", since with the publication of this paper it will have been.
The text was modified following the reviewer’s comment.

Line 121 has an incomplete sentence.
We apologize for this mistake. The incomplete sentence “Since κ increases with the concentration of ions in a solution” was removed.

Lines 148-149 there is an errant carriage return splitting the word "higher"
Corrected

Line 157-158: another errant carriage return
Corrected

Figure 2: It would be helpful (but not necessary) for clarity if the left y-axis legend was in blue text and the right y-axis legend in red text
Figure 2 was modified following reviewer#2 comment and now displays three separate panels.

Figure 3: Consider changing the y-axis to log scale so that the variations in, e.g., EC, levoglucosan and organics can be seen better
Unfortunately, due to the presence of zero values, changing the y-axis to log scale makes the variations of non-sea-salt species harder to read compared to a linear scale. For this reason, Figure 3 was not modified.