

Dear Paul!

Thanks a lot for this thorough check! We followed your recommendations (they are shown here in blue print) as described below. Those to which we do not respond directly we also did not mark in the revised version, as these were all really minor (technical editing). For ease of reading, we rearranged the sequence of your remarks.

Page 15, line 21: Kappa for NaCl should be around 1.5. Petters and Kreidenweis erroneously transcribed it from Koehler et al. (see last paragraph on page 5 and Table 1 in Zieger et al., 2017).

The value given in Zieger et al. (2017) is cited now as well. As Petters and Kreidenweis (2007) also show the discrepancy between kappa determined from hygroscopic growth and activation data, we still kept the citation and added explicitly that these two publications give different values (see bold script on p15, l14-16). As we are not explicitly dealing with NaCl, we would prefer to not elaborate more on this matter.

I'm a bit confused about the exact time frames of the performed measurements. On page 5 (line 26) and in Figure 5 you state that you started measuring in Nov. 2012, while Figures 2 and 6 suggest that you started in Dec. 2013 Please clarify where the missing year is.

The CCNC was operated during the three austral summers from Dec. 2013 until Feb. 2016. This is said in the starting sentence of the abstract, at the end of the introduction (p3, l5-7) and at the end of the first paragraph in the experimental section 2.1 (p4, l30-32, "As the Cloud Condensation Nuclei counter used for this study needs an operator on site, we mainly present data collected from December to February during three subsequent austral summers (2013-2016).").

The CPC has been operated since 2012, and this is what is referred to on page 5, line 26 (beginning of Sect. 2.2: "The CPC was first installed for continuous operation in November 2012.") and in Fig. 5. It was installed at the station all the time and operated (remotely controlled) during the austral winter as long as possible.

To make this clearer, previously to mentioning Fig. 5, we added (p11, l2) the bold text:

"Measurements of N_{CN} throughout the whole year were performed between 2012 and 2016, i.e., these measurements were done during more extended periods of time than measurements of N_{CCN} ."

Figure 3: Please elaborate a bit more in your figure caption about what is exactly. What are the units? Concentration of what?

We added to the caption: **"It shows the spatial distribution of particles that were released within 3 hours at the PE station and then tracked back in time over 10 days, based on back trajectories. The location of these particles was recorded every 15 minutes in a snapshot and these were then summed up to obtain the footprint."**

Figure 12: If possible, please improve your y- and x-labels. How many hours of measurements does this correspond to?

We exchanged the labels which were “Number” and “Kappa” by “Counts” and “ κ ”. As said in the caption, this is the data for all 2171 κ values derived for a supersaturation of 0.1% during the three years of measurements. This together with information of the length of the measurements adds up to roughly 600 hours of measurement, an information now added to the caption of the figure.

Page 2, line 16: Maybe add “away” after “far”. As “far from” already means “weit entfernt von” (I know you speak German ;-)), the “away” is not really needed.

Page 3, line 13 and line 24: I would recommend to stick to one tense (past tense as in the other sentences). Done.

Page 4, line 8: To be consistent with the other acronyms, I would use “CCNC” for the cloud condensation nuclei counter instead of “CCNc”. Done.

Page 5, line 25 and Page 6, line 6: replace “l/m” by “l/min” Done.

Page 6, second paragraph: Please mention that you mean (optical) diameters for the LAS. Done.

Page 7, line 19: Here and throughout the manuscript: The abbreviation “Sect.” should be used when it appears in running text and should be followed by a number unless it comes at the beginning of a sentence (https://www.atmospheric-chemistry-and-physics.net/for_authors/manuscript_preparation.html). Done.

Page 8, line 24: “asl” has been used before and should thus be defined at first occurrence. Done.

Page 11, line 1: Replace “Particle” by “particle”. Done.

Page 13, line 10 and 12 (and in Table 2): The unit “cm” should not be in italics (it should be cm^{-3}). Done.

Some Latex tips:

- I would not put “PNSD” in math-mode (so remove the $\$$ -signs) or would you consider it to be a variable? Done.

- Add ‘ rm ’ in the subscript for the critical diameter D_{crit} Done.

Kind regards

Paul.

Kind regards back from Heike & Paul and all co-authors