Dear Reviewer,

We thank you for doing this review and for your suggestions that helped to improve our manuscript. Below, please find your original comments in blue and our responses in black. When referencing page and line numbers, we are always referring to the original versions of manuscript and SI.

The paper presents a very straightforward description of aerosol measurements taken on Cape Verde during September and October of 2017. Particle and CCN number concentrations and particle size distributions are reported and compared for marine and dust aerosol types. The data presented are largely consistent with previously reported results for the North Atlantic. The few minor concerns I have are listed below.

Page 3, lines 4 – 6: Please define what is meant by "marine" aerosol. Given this statement on production mechanisms it appears to include all ocean-derived aerosol, not just sea spray.

Thanks for your comment. We added the following in page 3, line 4:

"Together with newly formed particles originating from gaseous precursors which can also be emitted from the ocean, this sea spray aerosol (SSA) contributes to marine aerosols."

Page 11, line 8: Cloud processing should also be included here in the growth of accumulation mode particles (e.g., Hoppel et al., JGR, vol. 99, p. 14443, 1994).

Thanks for your comment. We changed page 11, lines 6-9 and added your comments:

"Generally, Aitken mode particles are produced by homogeneous and heterogeneous nucleation processes, formed during natural gas-to particle condensation. Aitken mode particles are transferred to the accumulation mode through cloud processing (Hoppel et al., 1994) and accumulation mode particles are furthermore formed by coagulation of smaller particles or condensation of vapors onto existing particles, during which they grow into that size range (Seinfeld and Pandis, 2016)."

Page 13, lines 2 – 4: The criteria of "marine type" as having an Aitken mode larger than the accumulation mode needs more justification. What about cases when cloud cycling has occurred allowing for more accumulation of mass? Were the trajectories also used to categorize the aerosol types?

We tried different criteria for particle classification and checked our classification with backward trajectories.

When times with $N_{Aitken} < N_{accumulation}$ were included in the marine type aerosol, also trajectories that had passed closer to or over Africa were added to this mode, i.e., such a clear distinction for the trajectories as the one shown in the current manuscript could only be found when the criteria $N_{Aitken} > N_{accumulation}$ was included in the analysis. Therefore, it could be said that trajectories were also used for the categorization.

We added the following in page 13, line 4 to clarify:

"For the separation of this marine type, additionally also trajectories were examined."

Page 15, lines 2 – 5: Is it possible that the high Aitken number concentrations observed during the dust episodes could also be a result of input from the upper troposphere in the boundary layer? Figure 6 does not provide information about the vertical path of the calculated back trajectories.

Thanks for your comment. Indeed, during the dust type2 period, we observed that the backward trajectories often traveled from ~2500 m to the marine boundary. Therefore, the Aitken number concentration could also be a result of input from the upper troposphere in the marine boundary layer. We added the following to clarify:

"In our data, we found that backward trajectories often travelled from the upper troposphere down to the marine boundary during dust periods, which means that Aitken mode particles could have been transported from the upper troposphere. Therefore, there are different factors contributing to the observed high N_{Aitken} and $N_{accumulation}$ during dust plumes, such as direct transport of particles from the desert and Sahel region, and additional new particle formation and growth in the vicinity or in the upper troposphere."

Figure 10 caption: It would be helpful to include the color bar information here so the reader does not have to refer back to Figure 4.

Done.

Page 20, lines 11 – 13: Please provide a brief description of causes of the seasonality in kappa.

We added the following in page 20, line 12:

"This annual circle of κ likely originated in a change of chemical composition of the aerosol throughout the year, related to different precursors and a higher organic content during times with higher algal activity."

Page 21, lines 11 – 12: Fractions of SSA also are a function of the amount of non-SSA present. As stated earlier in the paper, the number concentration of SSA was not fully explained by local wind speed.

Thanks for your comment. We did indeed not acknowledge a possible higher fraction of particles in the Aitken and accumulation modes, and now mention that this impedes a direct comparison of the here discussed fractions. We revised page 21, lines 12-13 such that this should be clear now:

"However, these fractions not only depend on the concentrations of SSA but also on those of particles in the accumulation mode which have other sources. Still, the respective accumulation modes and related particle concentrations in Modini et al. (2015), Wex et al. (2016) and the present study resemble each other. Therefore the lower fractions of SSA particles in our study are likely connected to the low wind speeds (lower SSA number concentration) or, to some extent, to different accumulation mode particle number concentration."

Reference:

Hoppel, W. A., Frick, G. M., Fitzgerald, J. W., and Larson, R. E.: Marine boundary layer measurements of new particle formation and the effects nonprecipitating clouds have on aerosol size distribution, Journal of Geophysical Research: Atmospheres, 99, 14443-14459, 10.1029/94JD00797, 1994.