Atmos. Chem. Phys. Discuss.,
https://doi.org/10.5194/acp-2019-585-RC1, 2019

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Characterization of aerosol particles at Cape Verde close to sea and cloud level heights – Part 1: particle number size distribution, cloud condensation nuclei and their origins" *by* Xianda Gong et al.

Anonymous Referee #1

Received and published: 12 September 2019

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.

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).

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?

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.

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.

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

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.

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