

MS No. acp-2021-94

Title: Differentiation of coarse-mode anthropogenic, marine and dust particles in the high Arctic Islands of Svalbard

Authors: Congbo Song et al.

Response to reviewers

Comment on “3.1 Characterization of the k-means derived aerosol types”

In this section, the authors would need to explain that they apportioned the occurrence of coarse-mode aerosols during the study period (mainly from March to October), as described in Lines 6-7.

Response: We added “Note that the relative occurrences of the clusters are limited to the study period (mainly from March to October), and thus with limited coverage of the winter season.” In Line 220-221.

Comment on “5. Conclusions”

In this section, the authors had better explain the need for further measurements in winter, because the main conclusions are mostly based on the results from the study period (mainly from March to October). In addition, the authors may need to suggest the possibility that the importance of local sources might still be overlooked, because potentially local sources can not be captured by the backward trajectory analysis, as described in Line 255.”

Response: We added “Further measurements in winter season are needed to fill the gaps in the present study. In addition, a more in-depth observation (such as single particle composition) and analysis is needed to better quantify local sources, which might have been overlooked here because local sources are not captured by the backward trajectory analyses.” In Line 399-401.