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## ***Interactive comment on “Aerosol size distribution seasonal characteristics measured in Tiksi, Russian Arctic” by E. Asmi et al.***

### **Anonymous Referee #2**

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#### Review:

Asmi, E., Kondratyev, V., Brus, D., Laurila, T., Lihavainen, H., Backman, J., Vakkari, V., Aurela, M., Hatakka, J., Viisanen, Y., Uttal, T., Ivakhov, V., and Makshtas, A.: Aerosol size distribution seasonal characteristics measured in Tiksi, Russian Arctic, Atmos. Chem. Phys. Discuss., 15, 18109–18149, doi:10.5194/acpd-15-18109-2015, 2015.

The dataset is a very fruitful and very important to the community. The science behind it is well worth the scope of ACP, and the introduction is appropriate.

However, this paper as it stands needs severe major revision in order to go to ACP. At this stage, the paper does not tell a story and the data analysis (and particularly the presentation of the results) is poor.

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Goals: in the introduction it mentions accessing nucleation events, biogenic emissions and wild fires, but in the results very few data are presented on this regards.

It took me an hour to understand what table 1 and table 2 are. There are a number of clustering analysis, and I am not sure which one is which. I suggest making a table or explaining well what the statistical analysis are. When presenting clusters results, perhaps using subscripts and mentioning if they are smps,aps,volume, number or whatever data and analysis are presented and discussed.

section 2.2 It is written many other parameters are available, but only mainly meteo are used to describe the clusters - and it is easier to make mistakes when using only these. Are gases not available? Later in the paper BC data appears, surely it is needed to calculate average BC concentrations to see what clusters are related to natural or non natural emissions. Diurnal profiles of clusters are also missing.

section 3.2, using bullets points would help the reader to follow this complicated categories.

I suggest expanding this analysis with additional aerosol data if available, cause at this stage the analysis is poor and there are many different cluster analysis difficult to follow.

In summary, whilst the dataset is very useful, the data analysis and the presentation is not up to standards of ACP. I suggest making major revisions and clearly present the different clustering analysis.

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Interactive comment on Atmos. Chem. Phys. Discuss., 15, 18109, 2015.

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