

Interactive comment on “Variations in tropospheric submicron particle size distributions across the European continent 2008–2009” by D. C. S. Beddows et al.

Anonymous Referee #1

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This is a well-written article, providing useful insights into the particle size distributions collected at numerous European sites. The following comments can be considered before accepting the article for final publication:

The word “cluster” needs to be defined clearly in the very beginning of the article as this is currently confusing whether this is a group of sites in a particular region being analysed here, the grouping is based on certain qualification, or does this refer to a method or something else?

“The first category was identified as most frequently being detected inside and around

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Northern Germany and neighbouring countries,.. “ if the category is a cluster this sentence is unclear and does not make much sense?

“...arriving ultimately at the Arctic resulting in Arctic Haze.” What are the evidences of haze formation? Can the UFPs contribute to haze and if yes, up to what extent?

The details of methodology used for the cluster analysis needs to be explained in detail, perhaps as a part of SI material for the ready reference of the readers.

The authors may also want to look at the literature beyond their own work and discuss/cite this at the relevant places in the article.

There is a mention of harmonisation of the data collected from different instruments but very little details are available how the harmonisation process is performed. These details on what correction matrix is applied should be included either in the main text or in the SI material.

One of the weaknesses of the article is that the data considered for analysis is nearly 5-6 years old, but the recent data might be available. The authors should consider to include analysis of the recent years data (at least of 1-2 most recent years if not the all years) to make the article comprehensive and more useful for readers in order to demonstrate the trend in changing particle size distributions characteristics with the time. The methodology used has been used in authors previous work and by others and is pretty standard, but the strength of the work lies in the very good interpretation of the data to present an overall picture of particle size distributions at European sites. However this would be incomplete without adding the analysis of recent year's data.

Fig. 6 – does not show much and can perhaps be shifted to SI material.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 31197, 2013.

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