

Interactive comment on “Cloud condensation nuclei (CCN) from fresh and aged air pollution in the megacity region of Beijing” by S. S. Gunthe et al.

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Response to Referee#2

We would like to thank Referee#2 for the review and the constructive suggestions for the improvement of our manuscript, which will be implemented upon revision. Detailed responses to the individual comments are given below.

Referee comment:

1) *The effect of wet-removal on the aerosol properties is not mentioned at all in this*

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paper. Was there precipitation in the region over the course of the observational campaign, and if so, did this affect the aerosol distribution and properties?

Authors' response:

In the revised version of the manuscript we will add a time series of rain data in Fig. 3a. From this it is evident that there was no significant rain event during the campaign, except on 13 August, when at the same time the aerosol instruments were not working. Therefore we cannot tell anything about how rain might have influenced the aerosol properties.

Referee comment:

2) *Figure 1: To give the reader a better understanding of the region these observations are taken from, it would be good to show topography in Figure 1, as well as indicate the location of Yufa, the measurement site.*

Authors' response:

We tried to download the topography data from the USGS (United States Geological Survey GTOPO30 data) data center but unfortunately the data were corrupted for big parts of the Beijing region. We would be thankful for any recommendation of where else it is possible to download this kind of data and would then be willing to change the figure accordingly. The Yufa measurement site is already indicated by a blue cross.

Referee comment:

3) *Page 9971, lines 20-28: The mean of the effective hygroscopicity for this study is given as 0.3 +/-0.1 and said to be in agreement with a wide range of other studies. I recommend a table showing the effective hygroscopicity parameters from all these studies, as well as the location the measurements were taken at, along with the value presented here. This would be more informative and would also place the findings of*

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this paper in context.

Authors' response:

For a table of κ -values observed at different measurement sites around the globe the reader is referred to Pringle et al. (2010, Tab. 2). A more comprehensive review of recent studies would go beyond the scope of this paper, but is under way and will be presented elsewhere.

Referee comment:

4) Page 9976, Equation 1: Please give a more in-depth discussion of the validity of this equation, for different seasons, other regions etc.

Authors' response:

The equation can be expected to be valid also for other seasons or regions, whereby the average values of κ_{org} and κ_{inorg} may vary depending on the individual composition of organic and inorganic species, respectively. As shown already in Gunthe et al. (2009), Dusek et al. (2010), and Rose et al. (2011), however, these variations are typically only little. This has been already mentioned in Sect. 3.3 of our study.

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