

Interactive comment on “Size distribution and source of black carbon aerosol in urban Beijing during winter haze episodes” by Yunfei Wu et al.

Anonymous Referee #2

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Article represents results from a short (3 week) measurement campaign using a SP2 black carbon analyzer and a small amount of filter samples. Measurements are done on roof top of the institute at central Beijing. Based on these results and trajectory analysis, authors have developed a method for estimating the contribution of black carbon originating from a local traffic. Article is well written and easy to understand. Unfortunately the scientific novelty value of these results is poor. A very similar dataset was recently published by Wang et al., 2016, Atmospheric Environment. Article by Wang et al includes also three weeks of SP2 measurements, done right before this campaign in Beijing, partly by the same institutes. Also, several other articles containing SP2 measurement results have been published from Beijing and urban areas in Asia with longer data time series and much larger set of instruments. These already include the main results of this article. The developed method for analyzing the contribution of

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local traffic is poorly described and verified. Based on this article, it is hard to estimate if it works.

In order to publish this authors would need to significantly improve this article and include results with scientific novelty value. Including e.g. a longer dataset with data collected during different seasons and a larger set of instruments would definitely help. Also, authors should prove that the developed method works by comparing results of this method to other independent measurement data. Also, uncertainty estimate and overall validation of the method would be necessary. Also, would be important to state if authors think that this developed method will be applicable to other locations or only to Beijing. A literature review/comparison of these results to previously published BC size distributions and existing source analysis methods would also be needed. Also would be useful if authors could explain why the diurnal cycles of the BC from both traffic and other sources are highest during nighttime? I would assume that at least for local sources, maxima would be during morning or evening rush-hour? Also, uncertainty estimation for BC results and especially for the larger mode would be important addition. The large BC mode (with maximum at around 500nm) is very small and very close to the upper particle size limit of the instrument, so it would be important to estimate how real this BC mode is. Lastly, the title and aim of this article are slightly conflicting. Title suggest that this article focuses on BC size distributions and sources, whereas the aim states that the aim was to develop a novel approach to evaluate the contribution of local traffic to the rBC concentration. Might be useful to include the method development to the title, if that is the main goal.

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