

Interactive comment on “Absorption coefficient of urban aerosol in Nanjing, west Yangtze River Delta of China” by B. L. Zhuang et al.

Anonymous Referee #1

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Review of “Absorption coefficient of urban aerosol in Nanjing, west Yangtze River Delta of China” by Zhuang et al.

The paper report two years of aerosol absorption coefficient (AAC) measurement in urban Nanjing of China. Data correction of Aethalometer measurement is often overlooked in many existing study in China. It's glad to see that three correction schemes are applied and compared in this study for reporting AAC from Aethalometer measurement. The paper is well written and the measurements are reasonable. The reviewer think the paper can be published on ACP if following comments are addressed.

Major comments

- 1) Although the annual AAC of 2012 is comparable to 2013, the seasonal distribution of AAC is quite different. Summer AAC in 2012 is higher than 2013, but winter AAC in 2012 is lower than 2013. What's the cause of the different seasonal AAC distribution between two years? Is it associate with meteorology condition or emission?
- 2) For the clusters analysis of back trajectories, similar clusters can be grouped together. For example, 2 & 4 in 2012 and 1 & 4 in 2013.
- 3) Regarding to the MAE shown in Figure 10a, what instruments are used for absorption coefficient and BC mass concentration measurement respectively? If the BC mass used here is also from Aethalometer, the calculated MAE become circular reference and meaningless.
- 4) The author conclude that Schmid correction is more reasonable base on the comparison between average AAE from different correction schemes and average AAE retrieved from sun photometer measurement. The referee suggest that a scatter plot between hourly Aethalometer $AAE_{660,470}$ and CE-318 $AAE_{675,440}$ would be more convincing than a single average AAE comparison. The slope and the correlation coefficient can be used to evaluate the degree of agreement between AAE from different

correction schemes and AAE from sun photometer.

5) Figure 12 can be removed or put in supplemental materials since this information is not directly associated with the main topic of this paper. The reason of having dynamic cycle time for filter tape advancing in Aethalometer is to avoid overloading of the sampling spot on the filter. When the ATN reach a threshold (adjustable by user in the range of 75 ~ 125), the filter tape will advance to the next position. In other words, when the ambient AAC is higher, ATN takes shorter time to reach threshold. As a result, the interval is shorter when AAC is high. So this phenomenon is just a common characteristic of instrument itself and has nothing to do with the sampling site.