

Interactive comment on “Assessment of carbonaceous aerosols in Shanghai, China: Long-term evolution, seasonal variations and meteorological effects” by Yunhua Chang et al.

Anonymous Referee #2

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This paper by Chang et al. presented a detailed analysis of five-year (2010–2015) on-line measurements of carbonaceous aerosols (CA) at an urban supersite in Shanghai, China. Temporal variations of organic carbon (OC) and elemental carbon (EC) concentrations are thoroughly explored. Then, they discussed the properties of OC and EC as a function of the meteorological conditions and the air mass origin. Moreover, the authors integrated the results with historical filter-based CA measurements and satellite-based AOD observations, concluding that ambient CA concentration in Shanghai has decreased since 2006 after the introduction of cleaner natural gas and the control of vehicular emissions. The large data set presented in the MS are unique and important in terms of aiding the validation of atmospheric chemistry modeling and informing the

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effectiveness of air cleaning action to the public and policy-makers. Overall, this paper is well written and clearly describes the analysis, which addresses relevant scientific questions within the scope of ACP. I recommend this manuscript to be published after the following specific comments are addressed. (1) Title: the authors suggest that they are going to estimate secondary organic aerosol in their upcoming work. Given that the data used in their two MS are essentially the same, I suggest that the title of the current MS can be revised as "Assessment of carbonaceous aerosols in Shanghai, China. Part 1: Long-term evolution, seasonal variations and meteorological effects". (2) Page 7, lines 3-7: "concentrations of black carbon were continuously measured using an Aethalometer AE-31...880 nm wavelength is considered as the standard channel to determine BC concentrations". What is the mass absorption coefficient used for converting absorption coefficient to mass concentrations? (3) Page 10, line 25: I didn't see the citation. The difference between Sunset EC and Aethalometer BC is due to different techniques: Aethalometer is solely based on the optical technique while Sunset use the thermal-optical technique. Please note the paper by Petzold, A. et al. (2013), recommendations for reporting "black carbon" measurements, *Atmos. Chem. Phys.*, 13(16), 8365-8379, doi: 10.5194/acp-13-8365-2013. (4) Page 16, lines 25-26: what is the specific chemical reactions? (5) Conclusion: new scientific findings need more emphasis in comparison with previous work. (6) Table 1: this is a big table of data and difficult to take in. Could it be simplified by removing some variables?

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