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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Characteristics of aerosol pollution during heavy haze events in Suzhou, China" *by* M. Tian et al.

Anonymous Referee #2

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Manuscript on "Characteristics of aerosol pollution during heavy haze events in Suzhou, China" evaluates the atmospheric concentrations of PM, its chemical composition, and light extinction properties to understand the characteristics of haze events at Suzhou. Their results showed that haze events are characterized by the presence of enhanced concentration of secondary aerosol species and their precursors; further, abundance of OM, (NH4)2SO4, and NH4NO3 led to visibility impairment during the haze events. The study is useful towards understanding the role of pollutants in haze formation and visibility degradation and could help policy makers in specific control measures. This is an interesting piece of work, but in my view, the manuscript needs to be strengthened in terms of scientific analysis and its novelty. Authors should highlight in the "Introduction" and in their Results and Discussion, the gaps in understanding

(what is known and what we still need to understand through this work) related to aerosol pollution during haze events and how objectives and analyses presented in the manuscript for a specific location of Suzhou is different than reported information in literature for other locations influenced by haze events, e.g. Beijing etc. Also, there is a difficulty in the readability of the manuscript, this needs to be improved checking sentences throughout.

Specific comments:

Section 2.1: Please discuss uncertainty involved in measurements using each of the equipments.

Section 2.2.1: It would be helpful to the reader if you can include information on basis of "numbers" (such as 2.2 x fs(RH) and so on, what does 2.2 indicate?) used in the equation 1 (IMPROVE algorithm).

Section 2.2.2: please provide reason for 48 h back trajectories calculation; typically, taking into account lifetime of aerosols of the order of seven-days in the lower troposphere, should you perform 7-day back trajectory calculations?

Section 3.2.1: How does the chemical composition observed at Suzhou compares with that at Beijing or other places where haze events are frequent. Please discuss if sources of aerosol species are distinct between Suzhou and others.

Section 3.2.2: Please replace 'AM peak' and 'PM peak' by other relevant words. "It seemed that low visibility. . .southwest wind" please explain the possible reason for this.

Section 3.2.3: "In order to appoint. . ." please change the word "appoint". Your analysis show that while OM is the largest contributor to light extinction, but its contribution to PM during haze events is lower than rest of the water soluble constituents. Please discuss the possible reason for this.

Section 3.4: Please provide insights on emission sources corresponding to paths of clusters and PSCF analysis. Please discuss why a set of clusters are found to be

different than the rest.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 33407, 2015.