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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Atmospheric aerosol compositions in China: spatial/temporal variability, chemical signature, regional haze distribution and comparisons with global aerosols" *by* X. Y. Zhang et al.

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Responds to the comments from Anonymous Referee #3

"Zhang et al. investigated the spatial and temporal of aerosol components in China based on long-term measurements in various atmospheric environments, i.e., urban, rural and remote. The chemical composition, seasonal variation, and particle acidity are discussed in detail. In addition, the visibility degradation caused by the increasing anthropogenic emissions in China is systemically investigated as well. Since most

of previous studies in China are limited either at a single fixed site or a short-term sampling period, the data presented here is of importance to improve our understanding of the aerosol characteristics over a large scale in China, and also to validate regional/global models. Before publication, I have a few comments:"

A: Thank you for the thorough review of the manuscript, and the very positive evaluation.

"1.Mineral aerosol in China usually can be estimated as [Aluminum]/8%. Since the authors didn't measure Aluminum (Al), a description of the approach to calculate mineral aerosol is necessary."

A: Agree. The mineral dust determination has been discussed in our previous work (Zhang et al. J. Atmospheric Chemistry 44, (2003) 241-257). We used Fe (4% of mineral dust) to calculate the mineral dust fraction in our PM10. We have added briefly description in the revised manuscript.

"2.P26610, Fig. 6 shows that the estimated contribution of SOC is overall lower in summer (e.g., August) than other seasons. Generally, higher fraction of SOC in summer is expected due to enhanced photochemical production of secondary organic aerosol, while relatively lower contribution of SOC in winter due to less photochemistry. An explanation of the observed lower contribution of SOC in summer is needed."

A: During June and Oct. in China, we have two higher emission periods for biomass burning (Cao et al., 2006). Due to the big contribution of biomass burning to SOC, the SOC of total OC peak in June and October, especially for rural aerosols, can be attributable to the increasing influence of precursor's emission from biomass burning in June and October as described in previous section (Cao et al., 2010). We reworded the text to clarify this in P16.

"3.P26580, line 1. Elemental carbon is not identical to black carbon since they are measured by different approaches, i.e., thermo and optical techniques, respectively."

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A: We agree with this. We will not mention BC when we discuss EC in our revised manuscript.

“4. P26584, line 3: “Beiijg-Tianjin” should be “Beijing-Tianjin”; “Yangzi” should be “Yangtze””

A: Changed.

“5. P26584, line 14: missed “SO42-” after “between”?”

A: Added.

“6.P26590 line 21: “Ca2-” should be “Ca2+””

A: Changed.

“7. P26585, line 9: “HSO42-“ should be “HSO4-””

A: Revised

“8.P26605, Fig. 2. A description of the box plot is needed, e.g., the bottom and up represents 25% and 75% percentiles.”

A: Revised

“9. P26614, Fig. 10. Please give the color legend.””

A: Okay.

Please also note the supplement to this comment:
http://www.atmos-chem-phys-discuss.net/11/C12139/2011/acpd-11-C12139-2011-supplement.pdf

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Interactive comment on Atmos. Chem. Phys. Discuss., 11, 26571, 2011.