

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.

Anonymous Referee #3

Received and published: 12 November 2011

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 re-

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gional/global models. Before publication, I have a few comments:

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.
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.
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.
4. P26584, line 3: “Beijig-Tianjin” should be “Beijing-Tianjin”; “Yangzi” should be “Yangtze”
5. P26584, line 14: missed “SO₄” after “between”?
6. P26590 line 21: “Ca²⁻” should be “Ca²⁺”
7. P26585, line 9: “HSO₄” should be “HSO₄”
8. P26605, Fig. 2. A description of the box plot is needed, e.g., the bottom and up represents 25% and 75% percentiles.
9. P26614, Fig. 10. Please give the color legend.

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

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