

## ***Interactive comment on “Highly time-resolved chemical characterization of atmospheric fine particles during 2010 Shanghai World Expo” by X.-F. Huang et al.***

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The paper represents the characteristics of atmospheric fine particles during the 2010 Expo in Shanghai. Results of different chemical in submicron aerosol such as sulfate, organic, nitrate, BC etc are investigated using HR-ToF-AMS and SP2. This paper shows valuable data from a polluted region and the effects of air mass on aerosol characterization also was discussed. I recommend this paper to be published in the journal.

There are some specific comments for authors:

1. “2.2. HR-ToF-AMS operation and data processing”, Could the author give the size C1953

diameter for  $\text{NH}_4\text{NO}_3$  are mentioned for PSL? REPLY: The particle sizes of  $\text{NH}_4\text{NO}_3$  were 350 and 400 nm. This information has been added into the text.

2. “2.3. SP2 operation and data processing”, SP2 was set at 30 ml min<sup>-1</sup>. Compared to the suggested flow, the set flow is low. How stable that flow is? REPLY: The 30 ml min<sup>-1</sup> was quite stable, with a standard deviation of 0.31 ml min<sup>-1</sup>.

3. “2.3. SP2 operation and data processing”, The volume-equivalent diameters of individual BC particles can be derived from the measured BC mass by assuming a density. Please give the density which was used for this paper. REPLY: The information has been added as “. . .by assuming a density of 2 g cm<sup>-3</sup>.”

4. Page 9: “ which can be used as an empirical factor to convert organic carbon mass to organic matter mass in future filter-based aerosol studies in Shanghai.”. During this month campaign, how about the variation of this OM/OC ratio. It would be better to give out the mean and standard deviation. REPLY: The OM/OC information is now given as “. . .corresponding to an OM/OC (organic matter mass/organic carbon mass) ratio of 1.55±0.08”

5. Page 11: The diurnal variation of  $\text{SO}_4$  is little variation. Which is different from results from Beijing, etc, please give some explainnation. Since Sulfate is also a photochemical reaction products. REPLY: If one examines the diurnal patterns of  $\text{SO}_4$  in Shanghai (this paper), Beijing (Huang et al., 2010) and Shenzhen (He et al., 2011) in China, it can be found that all of them generally showed stable diurnal patterns, indicating that  $\text{SO}_4$  was well mixed in the boundary layer and thus had a dominant regional origin in China, as analyzed in the paper. Therefore, we do not think the difference between Shanghai and Beijing is significant enough to indicate different mechanisms.

6. Figure 1a: the PM1 mass and SMPS volume is correlated very well, but the ratio of PM1 mass to SMPS volume (estimated density) is about 2.5 by the naked eyes. The ratio is too high. Could the authors give more explanation? REPLY: Since SMPS itself may have significant uncertainties and assumptions, so we cannot totally use SMPS

as a standard. The comparison between SMPS and AMS depends on a lot of things, such as assuming density, particle shape, size range, and unmeasured materials. For example, what SMPS measured is between 15~600 nm and what AMS measured is up to PM1. The primary purpose of the comparison between AMS and SMPS results is to confirm their time trends.

7. Figure 4d Nork City, is that New York City? REPLY: Corrected.

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