

Interactive comment on “One-year record of organic and elemental carbon in fine particles in downtown Beijing and Shanghai” by F. Yang et al.

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Final author comments on “One-year record of organic and elemental carbon in fine particles in downtown Beijing and Shanghai”

By F. Yang, et al.

Response to referees’ comments on paper acpd-2004-0269

We thank two referees first for their constructive and detailed comments on our manuscript. Given there are a lot of common or similar comments in their reviews, we would like to response to their comments together.

1)Section introduction

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As mentioned in page 220, lines 6-11, this study is based on a 1-year PM_{2.5} monitoring program conducted in Beijing and Shanghai. In our previous papers of He et al. (2001) and Ye et al. (2003), we just presented the OC and EC data in their annual and seasonal averages for Beijing and Shanghai, respectively, but did not investigate them further in a weekly time-series basis as exploited in this manuscript.

2) Section sampling and analysis

About the sampling site Chegongzhuang in Beijing. As mentioned in page 221, lines 6-11, this site is located in downtown area in Beijing but not another sampling site (Tsinghua), and thus chosen for comparison with that in Shanghai. The sampler in the Chegongzhuang site was situated on the top of a building between a small road and a small inner square with some trees and a small grassland of about 300E80m. It was not located inside this square as an automatic air quality sampling station as mentioned in referee #1's comment.

As mentioned in page 221, lines 16-18, the detailed carbon measurement including the quality control and quality assurance employed in this study are referred to He et al. (2001) and Ye et al. (2003). The measurement is actually conducted in DRI as mentioned. Reference is to be made to Chow et al. (1993) as suggested. The problem of carbonates is also discussed in this paper, thus not repeated in our manuscript. In the revision version, we add briefly some information concerned for easy read, such as total volume filtered (about 4 m³) on average and uncertainties in the chemical measurements. We also add necessary information on the measurements of K, Fe, and C¹⁴ (by AMS) in this section, of which the data are discussed in the following section.

For OC data we only use that analyzed from the front filter. As mentioned in Referee #2' comment, in a key review paper Turpin et al. (2000) comment on the sampling artifacts of OC. A recent work by Mader et al. (2003) also investigate this issue for several different sampling configurations with sampling intervals from less than one hour to

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24 hours, and point out large difference between uncorrected and properly corrected sampling. To our knowledge, there is no such investigation on a weeklong sampling configuration adopted in this study, of which the 1-week sampling periods exacerbate the possible loss of semi-volatile organic compounds during sampling (He et al., 2001). It is uncertain to what extent the use of the backup quartz filter improves the accuracy of OC measurements. Thus in this study we do not follow the practice to use the back filter to adjust carbon values on the front filter. We remove “It is recommended to analyze only the front quartz filter (Chow et al., 1994; US EPA/NARSTO,1998)”.

3)Section results and discussion

As suggested, we make the discussion on OC and EC levels much more concise by cutting up comparisons with remote sites and those with other cities, while we add data interpretation for seasonal variability and intercity difference. We change “The slight weekly variations and low levels of OC and EC concentrations in the summer are reasonable since the local wind is mild in this season” on page 222, lines 11-12 to read “Low weekly variations of OC and EC concentrations in the summer are reasonable since the local wind is mild in this season.”, while we give an explanation on low OC and EC levels in summer later. For using C14 data of the samples collected in 2001, we quota that the annual coal consumptions were very close in recent years, since it is the dominant energy.

We agree that the SOC estimation method adopted in our manuscript is better used with short sampling times and for rather short campaigns. Given that this study is based on one-week integrated sampling for a full year, we remove the SOC data and discussion (section 3.4 Estimation of SOC) from the manuscript.

For other minor comments on typos and organization and paper clarity, we almost fully accept them and make corresponding modifications including for figures and tables.

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