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# ***Interactive comment on “Chemical characterization and source apportionment of PM<sub>2.5</sub> in Beijing : seasonal perspective” by R. Zhanget al.***

## **Anonymous Referee #1**

Received and published: 3 June 2013

The study analyzed data of PM<sub>2.5</sub> and its chemical components collected in Beijing using various methods. The data covered one month time in each season and the study focused on discussing seasonality of PM<sub>2.5</sub> and major components. The paper is generally well organized and only need some minor revisions, as listed below.

P9964, L26 and P9965, L22: The resolution for PSCF analysis is 0.5 degree by 0.5 degree, but the back trajectory resolution is 1 degree by 1 degree. Shouldn't the grid size for back trajectory be much smaller than the PSCF grid in order to obtain a reasonable accuracy in PSCF analysis?

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P9967, L9-12: If you have precipitation data, you should compare precipitation amount in this particular summer month with previous seasonal average data. You will then know if it is the less than usual precipitation that preventing the summer minimum. Then you can qualitatively discuss the impact of photochemistry, which also needs temperature data to support your hypothesis (e.g., if it was higher T than typical season mean).

P9967, L21-24, and P9968 L13-14: you attributed the lower winter time sulfate (compared to 2003 data) to effective emission control, but such as a decrease in sulfate was not found in other seasons. You also mentioned the increased vehicular emission may offset the control measure for NO<sub>x</sub>. I think the discussion in this paragraph should be improved. Firstly, you only had one month data which might not represent the season average. Secondly, the meteorology data for this month might be significantly different from the seasonal average of those years you compared. In order to identify the exact causes of the observed differences between different years and between sulfate and nitrate, you need to discuss meteorological data, and if possible to provide the emission data to support you conclusions.

P9968, L25-26: Do you have an explanation why the seasonality in your study was different from earlier studies?

P9979, discussion on Fig 11: Are the patterns shown in Figure 11 consistent with the current emission inventory for every species? The results/discussions have potential to improve the existing emission inventory for places with discrepancies. The trajectory resolution seems too rough though for this purpose. Also, you chose average concentrations as the “polluted” standard (P9965, L16). If you choose higher level, will the results significantly change your conclusion?

Editorial comments:

P9957, L28: Change “to improve slowly” to “to improve little, or even become worse”.

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P9974: you should move the sentence on lines 8-10 to the beginning of line 6 (first explain Table 2 then discuss data in Table 2).

P9974, L14-15: change “higher” to “highest” and “lower” to “lowest”.

P9975: L10-15: rewrite this sentence.

P9977, L23: delete the second “based”.

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Interactive comment on Atmos. Chem. Phys. Discuss., 13, 9953, 2013.

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13, C3029–C3031, 2013

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