

Interactive comment on “Highly time-resolved chemical characterization of atmospheric submicron particles during 2008 Beijing Olympic Games using an Aerodyne High-Resolution Aerosol Mass Spectrometer” by X.-F. Huang et al.

Anonymous Referee #1

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I believe the manuscript is well written. It discusses the results of the observations with enough details and yet in a concise and informative manner. The extent of analysis fits well with the scope of ACP and a multi-dimensional measurement such as HR-ToF-AMS. I recommend publishing the manuscript after these minor revisions are made.

1. P13221, From line 25 it sounds like PM1 levels in 2006 were lower than 2008 by 31% with the southerly flows, but it was actually 2008 levels that were lower, right? Please rephrase to clarify. 2. P13227, line 2, CE isn't really a correction for lack of 100% transmission efficiency of the lens at larger sizes. Is it believed that the lens

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transmission was not good and therefore you need to correct for the transmission as well? If not, I would take that part of the sentence in line 2 out. 3. P13230, line 12: Contribution of SO₄ to total mass seemed stable all the time, so it can't be related to severe PM1 episodes, but it's rather a more regional pollutant as the authors also mention in the later sections. Please clarify that here as well. 4. P13231, What is the reason behind having a peak in Chloride at 7-8 am?! If that is strictly temperature related, shouldn't it be higher during at night rather than after sunrise? 5. P13233, line 7, add 'have' to "... seemed not to have contributed significantly..." 6. P13236, line 3, consider removing 'for a mean situation'. 7. P13237, line 9, isn't OOA-2 similar for DO and AO? 8. P13237, line 23: It was interesting to read that for security reasons somehow the population was decreases BO and DO, so in line 23, do you mean "local" residents began to return AO? 9. Fig 1. Isn't the ratio of AMS mass to TDMPS volume indicative of aerosol density? If so, isn't density of 3 g/cc too high for aerosols of such composition? Is that an artifact of too high of a mass by AMS or too low of a volume by TDMPS? 10. Fig. 5, It would be nice if Fig 5 can be made with higher resolution. Also, the legend says that the inserted bar graph shows 'composition of BTs', which doesn't sound right. Maybe rephrase it as "...shows the directional variation of BTs before the Olympics, ...".

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