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Interactive comment on “Insights into characteristics, sources and evolution of submicron aerosols during harvest seasons in Yangtze River Delta (YRD) region, China” by Y. J. Zhang et al.

Anonymous Referee #2

Received and published: 5 May 2014

This paper describes chemical composition and sources of fine aerosol (PM₁) measured with an Aerosol Chemical Speciation Monitor (ACSM) during two different harvest seasons in China. Organic aerosol (OA) was the most abundant PM₁ component and it was apportioned by means of Positive Matrix Factorization (PMF) (supported by correlation with ancillary measurements) in 3 different classes: hydrocarbon-like OA (HOA), oxygenated OA (OOA) and biomass burning OA (BBOA). Much of the focus is on quantifying BBOA and discussing the importance of biomass burning as main contributor to the increase of PM₁ loadings during harvest periods because of agriculture

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fires. Importantly authors elaborated an equation for on-line estimating of the BBOA mass concentrations starting from the simple measure of the m/z 60 fragment in the ACSM mass spectrum. This is a well-written paper that clearly describes measurements and analyses, but maybe quite poor of incisive new findings. Nevertheless, it is a good manuscript suitable for publication after a few minor changes which are detailed below.

General Comments:

Section 3.2: Not enough information is presented regarding the organic source apportionment by PMF analysis. The authors don't state their reasons for not using the solution sets with 4+ factors in section 3.2 and these results are not shown graphically, which would be very useful to see. These could very easily be included as supplementary material. In particular the choice of keeping only one factor that encompasses HOA and COA should be better explained by adding (for example, as I already said) details on the solutions with more than 3 factors.

Section 3.4: The estimation of BBOA directly from a tracer mass (m/z 60) is a very useful task to address and is well attempted, but is here a very specific result: the proposed equations relate to two specific campaigns in a specific region. It would be necessary to better comment this point. Moreover it would be very useful to try to extrapolate one general equation valid at least for all the harvest seasons in the region (not one for each measurement campaign). However this work is a first effort to achieve this task (as far as I know) that can be used as a comparison in other future studies and could be definitely appreciate.

Detailed Comments:

PG9111, L17: "dominate" should be replace with "dominant".

PG9111, L27: This concluding sentence seems to be a little pointless. The heavy pollution events result associated both with transport and local sources giving misleading

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information to the reader: specify better the sentence or remove it.

PG9117, L4: add a link to the organic source apportionment section (3.2) in order to facilitate the reading.

PG9121, L9: why PMF doesn't isolate the COA factor? Specify better this point, even just showing the 4+ factors solution.

PG9121, L23&27: check the consistency of r^2 values with figures.

PG9122, L28: a little pointless and misleading sentence: it seems that BBOA (a primary component) was enhanced during the nighttime for the same reasons of OOA (aqueous-phase oxidation etc.) that is quite contradictory. Specify better or remove the sentence.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 9109, 2014.

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