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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Receptor modelling of fine particles in Southern England using CMB including comparison with AMS-PMF factors" *by* J. Yin et al.

Anonymous Referee #1

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Review of Yin et al. Receptor modeling of fine particles in Southern England using CMB including comparison with AMS-PMF factors

The authors present experimental results from a winter field campaign from an urban background and rural site in England. Source apportionment via chemical mass balance of PM 2.5 samples results are presented and compared to other published datasets in Europe and the US. This paper is presenting, for the first time, CMB results that have helped identify biogenic and food cooking SOA contributions in the UK. Also, the results from CMB analysis is compared to AMS-PMF results from the same campaign. Comparing results of two different receptor models is a challenging and

important exercise to validate the source profiles generated by both methods. These results merit publication after revisions and comments have been addressed below.

Scientific Questions

If the uncertainties can be estimated for each method, they should be included on Figure 5 and discussed in section 3.3.

At the end of section 3.2.2, the authors state that 55% of SOA is created from biogenic influence. Please specifically state that CMB method, which determined this fraction, can address the origin and composition, but not necessarily formation mechanism (unless the author can propose a mechanism).

Section 3.3.1, line 20, "It is interesting to note that both CMB-WS and CMB. . . are correlated more closely . . .at low levels. . ." Can the author provide an explanation as to why the two methods relate better at lower mass concentrations that at higher concentrations? Is it a result of measurement technique? Or something different?

In the conclusions, the authors make a general statement, "Work needs to be performed. . ." Specifically state what is needed to better constrain these issues.

Technical Comments: Organization comments: The authors include a brief comparison of the methodology of CMB vs PMF in the conclusions section; however, it would be best to include that also in the introduction. The receptor model differences are discussed briefly in paragraph three of the introduction. Since the comparison of the results between the receptor models is the major result in the paper, it merits a more thorough discussion, for example outlining the similarities and differences, and the benefits and/or limitations to each method.

Since the AMS-PMF method discussion and results are being published in Young et al 2014, it would be better to put the CMB model section 2.2.5 before the AMS data analysis section 2.2.3 section.

Regarding the AMS 2.2.3 section, since details are presented in this paper regard-

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ing the AMS-PMF solution, the author must cite the Young et al. 2014 paper at the beginning of the section.

Why is the 2.2.4 section on its own? Perhaps these two paragraphs should be moved to section four, where the PMF analysis uncertainties are discussed. If not, reference this section 2.2.4 in section 4 discussion.

Other comments: Figure 3 has a text box that says, 'NK (b)' in it. What does the (b) refer to? Figure 5 – Make the text readable in this figure. Also, the lines surrounding the graphs, the axis, and the grid-line spacing are inconsistent – make it uniform.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 24523, 2014.