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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Investigating the two-component model of solid fuel organic aerosol in London: processes, PM_1 contributions, and seasonality" *by* D. E. Young et al.

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Young et al. describe the identification and apportionment of two solid fuel sources contributing to primary organic aerosol in London in the winter. The separation of two factors is supported based on differences in mass spectral profiles, comparison with levoglucosan:potassium ratios, temporality and dependence upon wind direction. The central conclusion is that the inclusion of two factors may be prudent in future urban organic aerosol apportionment studies to help account for the continuum of compositions that may arise from different burn conditions. The importance of solid fuel combustion is also framed in terms of current and future abatement strategies for London. This

manuscript is well written, to the point, and is recommended for publication subject to some very minor revisions:

Title: perhaps "Investigating a two-component model....."

Page 20855: Line 9. This event could be removed as it may be leading to over-representation of HOA at this site. This would lead to a less representative apportionment of residential urban background conditions.

Page 20859, line 15: Pearson's r values for comparison of the two SFOA factors with a BBOA reference mass spectrum are discussed. The SFOA factors could presumably also be compared with more recently published reference spectra for SFOA and coal combustion that the authors refer to in the manuscript. Was this investigated?

Page 20859, Line 24-29: Rephrase these sentences replacing the "missing" descriptions, the section is difficult to follow.

Page 20860, Line 20-22, one of these should be SFOA2

Page 20862, line 11: "different phases of combustion occurring under similar conditions"? Please clarify

Page 20862, line 27: "low signals at m/z 60 and 73" But these are higher for SFOA1 than for SFOA2?

Section 4.3.2: At the end of this section, reinforce that potentially different burn efficiency for SFOA1 and SFOA2 is the point here.

Can the authors provide an explanation as to why one residential area to the south would be characterised by generally different burn conditions than areas to the east and west? It could be expected that large residential areas in any part of London would contain the same cross-section of less efficient and more efficient burners. This is a central point to the manuscript and it would be nice to expand on it. Is there a greater install base for more efficient burners in different residential areas? Are these

data available?

Page 20863, line 14: "mass resolution"

Page 20863, line 18: perhaps replace SOA with OOA for consistency

Page 20865, line 22: "Changes in economy" is quite broad. Perhaps a statement on a potential increase in oil or gas prices relative to solid fuel prices would be more appropriate

Fig. 3 caption: Remove clause after (Carslaw, 2013). "openeair" typo?

Fig. 5 Typo in "Cubison" on graph

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 20845, 2014.