

## ***Interactive comment on “Spatial and temporal variability of sources of ambient fine particulate matter (PM<sub>2.5</sub>) in California” by S. Hasheminassab et al.***

### **Anonymous Referee #2**

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The paper provides receptor-based PM<sub>2.5</sub> source apportionment at 8 California sites that covers 6 year period. Although receptor-oriented techniques have been widely used for PM source apportionment, previous studies were limited particularly by a smaller data set. In this sense, the paper provides some new information that is relevant to the readers of this journal. I recommend the paper be published after the authors address the following comments:

1. Uncertainties. Somewhere in Section 2.3.1 or 2.3.2, the authors should more clearly mention how uncertainties for different elements were estimated. In addition to analytical uncertainty, what other factors were included in calculating the uncertainties.

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2. OC artifact correction. Table S2 shows corrections various quite significantly among different sites, supposedly caused by different levels of OC and the detailed chemical composition and volatility. More importantly, at a number of sites, the OC concentration might have decreased significantly during the six year period. Should the correction factors also be time dependent?

3. Is the estimated PM<sub>2.5</sub> mass (as used to generate Table 3 and Figure 1) reconstructed from the resolved chemical components? If so, what is (are) the equation(s) used? Particularly, any consideration of possible seasonal variation of OM/OC when the mass was reconstructed?

4. "standard error". In Figures 2-8, it is stated that "error bars correspond to one standard error". It is unclear, however, the exact meaning of one standard error. Are these based on all the daily concentration data (2002-2007) that fall in a given season? If so, it represents variation of the source contributions over the years. Or, are the standard errors based on error propagation of the uncertainties in the PMF resolved species concentrations using source profile uncertainties from the boot strap runs?

5. Year-to-year variation. On page 20055, the authors stated that lack of year-to-year variation in source contributions can be deduced from the small standard errors in the 6-year average. However, these are absolute concentrations. I am surprised at the small standard errors in Table S2. PM<sub>2.5</sub> decreased quite significantly from 2002-2007 at a number of sites, for example, PM<sub>2.5</sub> in LA decreased from ~22 to ~15ug/m<sup>3</sup> from 2000 to 2006. Should the year-to-year variation be much more significant than ~1.0ug/m<sup>3</sup> as shown in the Table?

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