Atmospheric
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Discussions

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Interactive comment on "Chemical characterization of fine organic aerosol for source apportionment at Monterrey, Mexico" *by* Y. Mancilla et al.

Anonymous Referee #4

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The authors reported organic molecular markers (tracers) of various OA sources in the Monterrey region of Mexico. They collected daytime and nighttime samples in spring and autumn of 2011 and 2012. They attempted to apportion aerosol sources based on diagnostic ratios and CMB model. The report provides a referable dataset in the region where studies on aerosol sources were limited. They concluded that local anthropogenic emissions, mostly dominated by vehicle exhausts, are the major sources of PM. Before recommending publication, the authors are suggested to consider the following concerns.

Major concerns

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1. The development of the manuscript. The authors focused on the diagnostic ratios when discussing tracer and OC sources. However, "such ratios should be used with caution" as being pointed out by themselves in P17982, L23. They then attempted to quantify the source fraction of PM using CMB model, but with very little development. To make the manuscript more readable and consistent, the authors are suggested to consider one of the two possible ways to revise it.

The first way is to discuss PM sources focusing on the tracers, make extensive comparisons with up-to-date studies in the community. More detailed data profiles and analyses are needed. Statistical analyses on the daytime/nighttime differences and seasonal differences, and the implications are also needed.

The second way is to focus on the model results, as were suggested by other referees.

In either case, the authors are suggested to provide clear research purposes in the Introduction section.

2. Methods. Using the method of solvent extraction followed by GC/MS to determine organic compounds, the recovery, precision, and repeatability are key parameters to assure the data quality. Specifically, the uncertainty information is needed in model inputs. The authors are suggested to provide such information.

3. The biogenic sources. The authors found that the carboxylic acids are the most abundant identified OA components, while they are mainly from biogenic sources (Section 3.4). However, of most of the discussions and the corresponding conclusions, the authors emphasized the anthropogenic sources. The application of CMB model with very small sample size may not assure a reliable output. Although the samples were collected in an urban site, the regional sources should not be ignored. The authors are suggested to examine the general (seasonal) air circulation pattern, as well as those with respect to episodic events if any.

4. The biomass burning sources. Similar with those of biogenic sources, regional

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input of biomass burning emissions should also be considered. Moreover, domestic burning, such as the burning of woods for heating and cooking might also contribute to the elevation of levoglucosan. Levoglucosan of being several tens of ng m-3 was not low. These episodes worth being deeply analyzed.

Minor concern

Wood smoke markers. What compounds were used as wood smoke markers were not given.

Technical correction

Term of alkanoic acids/carboxylic acids should be uniformed.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 17967, 2015.