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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Size-distributions of *n*-hydrocarbons, PAHs and hopanes and their sources in the urban, mountain and marine atmospheres over East Asia" *by* G. Wang et al.

Anonymous Referee #2

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The subject manuscript compares the size distributions of n-Akanes, PAH, Hopanes and during different seasons at three contrasting sites in East Asia. The experimental methods and data analysis tools are reasonable well documented in the literature and as the authors state on page 13862, lines 5-8 that similar studies have been conducted in the costal cities of China but this is the fist study to examine inland sites. Although the manuscript does present interesting data for three very different locations, the manuscript does not present advances in methods, data analysis, or new insights into atmospheric science. As a result the study is more of local interest and

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Interactive Discussion
Discussion Paper

I do not believe that the manuscript will be or broad interest to the readership of ACP. The authors need to better highlight the novelty and advances associated with the paper before publication in ACP. In addition, I have some concerns about the manuscript that need to be addressed before the manuscript should be considered for publication.

General Comments

1) The numbers of samples used in the manuscript are very small and no information is provided concerning the representativeness of the measurements for the locations studied. 2) The statistical aspects of the data analysis are virtually non-existent in the manuscript. Throughout the manuscript, the authors make statements about peaks in the size distribution and peaks in the distribution of compound concentrations and ratios that are not supported by the data given the reported uncertainties. Likewise, the authors present considerable comparisons of GMD but provide not information of the uncertainties obtaining these results from the measurements. 3) The manuscript tends to infer an understanding of the sources of organic carbon in many locations but the presented analysis only addresses three categories of tracers and is not sufficient to infer results about organic carbon sources or distributions. Such analysis is possible with the measured data but is not presented and comparison to source profiles that include organic carbon since organic carbon was not measured in this study or at least not reported. 4) The three samples location are actually very far form each other and the local sources impacting these sites as well as the long range transported sites could also be quite different. To this end, the pairwise comparison of the data from the sites seems inappropriate in the context of sources. In this context, I question the conclusion stated at the end of the abstract that the differences are solely due to atmospheric processing.

Specific Comments

1) Title – I am not sure that the term “n-hydrocarbons” is appropriate. I think this should be n-alkanes. I am not familiar with the terms n-hydrocarbons. 2) Page 13862, lines

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18-26- The duration of sample collection was never specified. How long were samples collected? It seems that they were collected for several if not more days. What has been done to demonstrate that the long sample times did not impact the measurements? 3) Page 13863, line 28 – The statement that "no serious contamination was found in field blanks," is very subjective. A more quantitative presentation of the blanks and other QA/QC should be presented. 4) Page 13864, lines 4-5 - I see no reason that the authors should "advertise" a forthcoming paper. How is the fact that measurements are not presented here important the current paper? 5) Page 13865, lines 3-5 – The assessment of pollution in Baoji is very anecdotal. Can the authors support this claim? Are the authors referring to PM, organic aerosol, or the compounds measured in this study. 6) Figures 2, 3, and 4 – Error bars should be presented to see if the conclusions stated by the authors are robust.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 13859, 2009.