

Interactive comment on “Organic tracers of fine aerosol particles in central Alaska: summertime composition and sources” by Dhananjay Kumar Deshmukh et al.

Anonymous Referee #3

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This study presents the results of organic compounds measurements made during the summer of 2009 at Fairbanks site in central Alaska. Organic aerosols are a hot topic in aerosol science. Within that biomass burning is of particular interest since it is one of the main sources of organic aerosols. The authors have performed a lot of high-quality lab analysis. The data set is impressive. I think that the results are unique and will be of interest to many in the atmospheric science population. I recommend the manuscript for publication after the following comments are addressed.

Line 27-29: The authors concluded that forest fires and plant emissions are the crucial factors controlling the molecular composition of organic aerosols in central Alaska.

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Can authors discuss the contributions of biomass burning tracers and other tracer compounds to organic carbon and compare with previous studies in the revised version?

Line 72-78: This is a piece of the limited information provided by authors about the previous studies over the Arctic. An in-depth discussion about the findings of earlier studies should be included in the revised manuscript.

Line 107: The authors mention that field blanks were analyzed. But how many field blanks were included in the analysis? This would be useful information to include.

Line 136 and 137: Do the authors correct the concentrations of reported organic compounds for recoveries. It should be mentioned in section 2.3.

Line 172-175: Hennigan et al. (2010) proposed the degradation of levoglucosan by hydroxyl (OH) radical. How does it affect the concentration level of levoglucosan during summertime in central Alaska?

Line 211-222: The authors compared the L to M ratios in Fairbanks PM2.5 samples with few studies reported for L to M ratios in specific burning materials. I suggest discussing the differences in L to M ratios in Alaskan aerosols and aerosol samples collected over the Arctic region and other locations.

Line 569-573: There is a minimal discussion of the implications of the results in the context of Arctic climate. The manuscript would benefit from referring to any existing literature on the contribution of biomass burning to the aerosol burden. Such a discussion would significantly improve the manuscript.

Table 1: I would suggest adding median values for the concentrations of compounds groups presented in the table. A separate table showing the list of all organic compounds detected together with their concentration levels in all PM2.5 aerosol samples of Fairbanks would be useful for the readers.

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