

Interactive comment on “A comparison of PM_{2.5}-bound polycyclic aromatic hydrocarbons in summer Beijing (China) and Delhi (India)” by Atallah Elzein et al.

Anonymous Referee #2

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General comments:

This paper presents a comparison of PM_{2.5}-bound PAHs in Beijing and Delhi. The diurnal and nocturnal variations of 17-PAHs in both cities were discussed, then the major emission sources were identified and the health risk was assessed. The novelty, if it is, as the authors state, is the high-time resolution ambient particle samples (every 3 hours during daytime and over 15 hours at nighttime) during the summer season. A natural question to this study would be what causes the PAHs to exhibit the diurnal and nocturnal variation and what are new findings based on the high-time resolution samples. Unfortunately, this paper does not seem to present new findings. The discussions are

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also too general. Additionally, the manuscript is generally readable though proofreading and grammar corrections would improve it substantially. Overall, although the data are likely new and can be potentially useful in understanding the variation of PAHs in summer Beijing and Delhi, the paper is not sufficiently rigorous to warrant a publication in ACP.

I use the abstract to illustrate my main concerns of the paper. The abstract says: The mean concentration of particles less than 2.5 microns (PM_{2.5}) observed in Delhi was 3.6 times higher than in Beijing during the measurement period. In Beijing, ... the highest contribution from Indeno[1,2,3-cd]pyrene, while at night-time ... the largest contribution from Benzo[b]fluoranthene (14 %). In Delhi, ... the largest contribution from Indeno[1,2,3-cd]pyrene in both the day and night. Local emission sources were typically identified as the major contributors to total measured PAHs, however, in Delhi 25 % of the emissions were attributed to long-range atmospheric transport. The high contribution of 5 ring PAHs to total PAH concentration in summer Beijing and Delhi suggests a high contribution from petroleum combustion. In Delhi, a high contribution from 6 ring PAHs was observed at night, suggesting a potential emission source from the combustion of fuel and oil in power generators. The lifetime excess lung cancer risk (LECR) was, 2.2 times higher in Delhi (LECR = 155 per million people) than in Beijing risk assessment value (LECR = 70 per million people).

The highlighted results above are not really exciting. In fact, many researches have reported the diurnal and nocturnal variations and source appointment of PAHs in Beijing and Delhi based on the low-time resolution samples. I cannot see new or exciting findings in this paper. So I would suggest they focus on the new findings of the study, which cannot be obtained by the low-time resolution samples.

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