

***Interactive comment on* “Characteristics of the main primary source profiles of particulate matter across China: from 1987 to 2017” by Xiaohui Bi et al.**

Anonymous Referee #3

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The authors investigated the evolution of primary source profiles of PM in China between 1987-2017. They reviewed a total of 3244 chemical profiles, assessed their uncertainties, and conducted a cluster analysis to analyze the heterogeneity across different source categories. There are many studies in literature that have summarized the characteristics of PM source profiles in China. Compared to the previous studies, the method used here is not novel, and I don't see much scientific significance in this paper though it summarized plenty of data and did some analysis. The paper is not well written and needs lots of editing. My major comments are as follows.

(1) After reading the title, I expected the evolution of source profile with time was one

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research focus. However, the paper only analyzed the evolution of source profiles from vehicle emissions. I suggest the authors provide more discussions on other important sources (e.g., coal combustion and industrial emissions) if possible.

(2) Abstract. The authors mentioned “the most complicated profiles are likely attributed to coal combustion and industrial emissions.”(Line 17). This is well recognized thus not appropriate to repeat it in the abstract. Please focus on the main findings of this study. For example, the results of cluster analysis should be summarized in the abstract.

(3) Introduction. The introduction part presents weak literature reviews. A literature review is much more than a descriptive list of materials available.

(4) Method. It is not clear to me how the authors selected the source profile that is of acceptable quality. What is the criteria for inclusion or exclusion of a profile from a literature? It is important that the method part is self-contained and clear enough for audiences to reproduce the given results.

(5) Section 2.3. The title need to be reconsidered since this section contains the analysis using the coefficient of variation as well.

(6) As a significant source, residential coal combustion is missed in the paper. Please provide more discussions.

(7) Line 184, the description of VOCs source profiles seems not quite related to the topic of this paper.

(8) Line 246 and figure 5, please check the figure and raw data if Si and carbon components for RSM are significantly higher than DTSM.

(9) Figure 11, please clarify the information of the chemical profile given here, i.e., is it an average profile or related to a specific cooking style?

(10) Many syntax and spelling errors in the text. For example, Line 33, “While the profiles of road dust and soil dust.”; Line 307, “Given that there are many

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factors.”.

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