

Responses to Referee:

1 General Comment

The response by Li et al. addressed this reviewer's second round of comments in a point-by-point manner. While the authors had adequately addressed almost all of these comments, it feels like the authors are still not being clear enough in section 3 that the "particle size distributions" are "SPAMS-specific size distributions." The authors also need to be clear that their discussion of the SPAMS specific size distributions, especially as they pertain to the interpretation of particle-type sources, is dependent on the detection efficiency of this particular SPAMS instrument.

Response: Following the reviewer's suggestion, we have added the following explanations in Section "2. Methodology".

Line 142-148

"Particles measured by SPAMS mostly are within the size range of vacuum aerodynamic diameter (d_{va}) 0.2-2.0 μm . This SPAMS-specific size distribution is semi-quantitative evaluated the relative concentration and contribution of each particle type, mainly due to it largely dependence on the particle-detection efficiency (Allen et al., 2000; Yang et al., 2017). The characteristics of SPAMS-specific size distribution are statistical results, while the comparison of the relative distribution and number fraction of different particle types in each size bin are significant."

In order to more clearly emphasize the specific characteristics of particle size distribution using SPAMS, we have replaced the related "particle size distributions" as "SPAMS-specific size distributions" in the current main text (in Section 3.2) and figure captions. Detailed revision also finds the marked-up manuscript with tracked changes in the revised manuscript.

Reference:

Allen, J. O., Fergenson, D. P., Gard, E. E., Hughes, L. S., Morrical, B. D., Kleeman, M. J., Gross, D. S., Galli, M. E., Prather, K. A., and Cass, G. R.: Particle Detection Efficiencies of Aerosol Time of Flight Mass Spectrometers under Ambient Sampling Conditions, *Environ. Sci. Technol.*, 34, 211–217, <http://dx.doi.org/10.1021/es9904179>, 2000.

Yang, J., Ma, S. X., Gao, B., Li, X. Y., Zhang, Y. J., Cai, J., Li, M., Yao, L. A., Huang, B., and Zheng, M.: Single particle mass spectral signatures from vehicle exhaust particles and the source apportionment of on-line PM_{2.5} by single particle aerosol mass spectrometry, *Sci. Total Environ.*, 593–594, <http://dx.doi.org/10.1016/j.scitotenv.2017.03.099>, 2017.