

We show our gratitude to Anonymous Referee #1 for his constructive comments. We have revised the manuscript accordingly. Please find our point-to-point responses below.

Response to Anonymous Referee #1's comments (round 2)

The authors' manuscript has been considered according to the suggestions of the reviewers and has appropriately revised. But there is still one issue which is not well addressed. Therefore I would recommend the paper for publication after these revise.

The authors replied that the relationship with LDSA concentration for some parameters is not always linear. I agree with that. Therefore, while the requirements for the model may be met, I am concerned that the difference in the time series variation of each ratio may not be able to describe the difference in potential contribution to the particles. In particular, the authors describe that ultrafine particles emitted from vehicles such as BC increase the LDSA concentration, while rush hour contribute to those BC concentrations rather than LDSA concentration from differences in temporal variations. This can be quite confusing. Certainly, the mathematical contribution for each value may be explain to more contributed by the BC concentration, but is it due to the different properties of each parameter? Or is it explained by the time-dependent increase in particle size of the ejected particles during the rush hour?

Response: Thank you for the comment. The reviewer is right that the difference in time series variation may not be able to fully describe the difference in potential contribution to the particles. During rush hour, the emitted particles from traffic are usually smaller in size, dominated by diameter less than 50 nm. In this size range, the lung deposition factor that constitutes LDSA can be up to 0.5 (Figure 1). As time goes by, the particles may grow to a larger size that has another deposition factor. Therefore, the ratio between LDSA and different parameters are dependent on both the different properties of each parameter (e.g. the lung deposition factor), and the time-dependent increase in particle size (e.g. new particle formation), as the reviewer pointed out. However, based on the data/results in this manuscript, we could not draw a concrete conclusion of the underlying reasons for the difference in the time series variation of each ratio. The original text can only partly show the reasons. To avoid confusion, we inserted a few sentences in Section 4.2 to describe more on what we expected to tell by showing the ratios of different parameters.