

## **Responses to Editorial Comments:**

The authors have successfully addressed the concerns raised by the two reviewers. The revised manuscript is scientifically sound and contributes to the carbonaceous aerosol modeling field over the Indian monsoon region. Therefore, I recommend its publication after considering the following suggestions for technical corrections.

*Response: We thank the Editor for recommending publication after the technical corrections. We have modified the manuscript based on the suggestions. The revised sections are highlighted.*

1/ The model evaluation results of the different sensitivity simulations clearly shown that the dominant source of model performance improvements is the use of the regional emission inventory, while the dynamic ageing scheme only has a marginal effect. This should be emphasized throughout the text, including the abstract and the conclusions.

*Response: This has been emphasized throughout, including Abstract and Conclusions.*

2/ The figure used on the response to the 6th comment of the 2<sup>nd</sup> reviewer illustrates excellently how the two developments/modifications contribute to the overall improvement of the model performance. I suggest to include this figure on the main text.

*Response: This figure is now included in the min manuscript (Figure 9).*

3/ Lines 37-39 and lines 519-521: I suggest to rephrase these two statements since they are misleading. While both modifications lead to improvements on the model performance, clearly the emissions are far more important.

*Response: We rephrased these statements in the revised version.*