

Interactive comment on “Wintertime radiative effects of black carbon (BC) over Indo-Gangetic Plain as modelled with new BC emission inventories in CHIMERE” by Sanhita Ghosh et al.

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Reply to Referee #4 on their previous comment

Dear Referee:

Thank you for your valuable comments and suggestions for the manuscript previously. Specific changes were made in response to the comments (please see below) and were posted in Author's response file uploaded on September 24, 2020. We also uploaded the revised manuscript with suggestions implemented on September 24, 2020. Please let us know of any of your comments further.

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Referee #4: Authors estimated radiative impact of black carbon (BC) aerosols over IndoGangetic Plain (IGP) using high resolution ($0.1^\circ \times 0.1^\circ$) chemical transport model (CHIMERE). Initially authors assessed the new BC emission inventories (Constrained, bottomup - Smog , C mip , Edgar , and Pku) and through a detailed validation and statistical analysis of simulated BC concentration with respect to ground-based measurements at several stations over the IGP (both spatial and temporal variations). The draft manuscript is generally well organized and written. Considering these, I strongly recommend this paper for publication in ACPD.

General comments: 1. The definition of Bias, NMB, RMSE are well known to the community and authors need not to present them here. Response: We understand Reviewer's view. But still for clarity on calculations, we keep the formulations in the present version of the manuscript.

2. Lines # 255 and # 260 need appropriate references to support the attributes. Response: This is done.

3. From the several publications, I noticed that BC mass fraction reported in this study over IGP is similar to the other Indian sites and also Kaashidhoo (Maldives), and Bay of Bengal. Can authors comments on this?

Response: Thank you for the suggestion. The above information is now incorporated. These analyses thus indicate that the BC mass fraction and BC-AOD fraction maintains relatively uniform values or a lower spatial variability compared to BC mass concentration and BC-AOD.

4. Author may change the level of x-axis of Fig 4 as 0, 4, 8... 24 instead 0, 5, 15, 20.

Response: Thank you for the suggestion. This is done.

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2020-511>, 2020.

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