

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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Received and published: 27 December 2020

Reply to Referee #3 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 #3:

The submitted manuscript examines the sensitivity of radiative effects of black carbon (BC) over the IGP of India using offline model CHIMERE and five different emission inventories. I noticed that there is no discussion on the BC emission inventories and why they differ in their estimate over India. I would therefore suggest to at least adding a better description of emission inventories in the stage to the discussion document. What is the motivation of selecting wintertime is not clearly coming in the introduction. Over all MS is ok and can be sent out for discussion and review.

Response: Thank you for the suggestions. As per Reviewer's suggestion, we have further provided more details on emission inventory description. Please also see Section 2.1.3 and refer to Table 1.

A suggested improvement in Introduction for wintertime motivation is also included. In addition to the above, we have also now introduced a more clarity in usage of "offline" term for the model description (refer to Section 2.1). The CHIMERE is a chemical transport model (CTM). The CTM needs to be forced by meteorology. The CHIMERE (model version 2014b) configuration in the present study is forced externally by Weather Research and Forecasting (WRF-V3.7) model as a meteorological driver in offline mode, meaning that the meteorology is pre-calculated with WRF then read in CHIMERE. In case of our study, this configuration has an interest since we are performing emission scenarios. Having calculated the meteorology one time, we are sure that the differences between the simulations are due and only due to emission scenarios and not to possibly chaotic retroactions due to an online coupling between meteorology and aerosols.

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

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