Thank you for responding to my comments. The responses have significantly improved the manuscript. Based on the responses, I have additional comments listed below.

- Supplementary Table S1: Please show the statistics for all the 9 stations separately. Normalized Mean Bias percentage is defined as:
$$NMB\ (\%) = \frac{\sum(Model - Observation)}{\sum Observation} \times 100\%.$$
  Please update the equation and recalculate the numbers. Kindly change 'MB %' to 'NMB %' in the header. Update the main text accordingly. Why is the p value for Patna so high compared to other locations? Kindly include the number of datapoints used to calculate the statistics. Change 'NMRSE' to 'NRMSE'.

- A sensitivity study was conducted by including trash burning emissions. Please add a line commenting on the NMB value for $PM_{2.5}$ concentrations in that study.

- Including the equations for the Taylor diagram is helpful. I further suggest the authors to pick any station: for example, pick station 2 for EXP2 and guide the readers about what specific information can be obtained from Figure 3.

- The equation for centered RMS is repeated twice. Please fix. What is the significance of the centered RMS?

- The authors claim that a PBL scheme which works fine for summer over IGP, might not work for winter, as a motivation for designing EXP1, 2, and 3: Are there any known seasonal biases in the PBL schemes used for this study? A short description is needed. The authors might also add a few lines (or a table) briefly describing the differences between different PBL schemes used in this study? (See Xie et al., 2012, for example. They recommended using ACM2 PBL scheme for both summer and winter, for a different, but highly polluted region)

- A few lines should be added in the conclusion/discussion section about the inability of the model to simulate the aerosol-fog interactions and the potential affects it might have on the outcome on the paper. On that note, why the exchange co-efficient of heat is needed to calculate the activation fraction? Kindly refer to relevant equations/literature for better clarity.

- How do the authors identify whether a fog event is Radiation Fog or an Advection Fog (Both from the observations and the model)?

- L397: Fix grammar. Change Mean Bias to Normalized Mean Bias.

- Figure 1c: I think the units are not required for the title. Please change the title to: "Anthropogenic $PM_{2.5}$ Emissions". Please increase the gap between texts: 'Kanpur' and 'Lucknow'. Change kg/m^2/s to kg m^{-2} s^{-1}.

- In Line 349, and in the caption of Figure 3, please clarify if the cloud water mixing ratios are grid average or in-cloud (i.e. divided by cloud fraction). Kindly incorporate the same change throughout the manuscript.
- L667: change "diagnostic output.." to "diagnostic output.
- L445: Typically, what percentage of $PM_{2.5}$ mass is secondary in the IGP? How much is nitrate?
- L487: I recommend changing µg/m2/hr to µg m^{-2} hr^{-1}. How accurate is the dry deposition flux in the model? Cite previous work, if available.
- L603: Fix grammar.
- L672: Please explain "more CCN are expected with aqueous chemistry"
- Kindly change ug/m3 to µg m^{-3} or µg/m^3 throughout the manuscript.
- WRF-Chem simulations does not have fog in NWIGP, and hence could not be compared with the WiFEx campaign data: Please add a few lines in the conclusion/discussion section.
- L12: Improve the sentence structure.
- How are the representative stations selected? Are there data available only from the 9 stations across the IGP during the study period?

References:

Xie, B., J. C. H. Fung, A. Chan, and A. Lau (2012), Evaluation of nonlocal and local planetary boundary layer schemes in the WRF model, *J. Geophys. Res.*, 117, D12103, doi:10.1029/2011JD017080.