

Dear Editor,

We appreciate for your time reviewing this paper and all your comments and suggestions. Here are our responses point by point in blue.

Comments to the author:

In my reply from 10/11/2022 I have intended to request adjusting the vertical axes scales for Figure 6, however by mistake I mentioned Figure 5. Please adjust these. Figure 6 axes and caption also should explicitly mention that the *difference* to the RMSE original case is plotted (or use the Δ symbol). That is, the caption should read: "Figure 6: Stacked bar plots of changes to RMSE (y-axis) stratified by region (color), simulation and case (x-axis), and season (subplot) for hourly PM2.5, O3, and NH3 calculated from grid–grid pairs with respect to the orig simulation."

Thanks for the suggestion. We have adopted. Figure 6's caption in the revised manuscript reads as:

"Figure 6: Stacked bar plots of changes to RMSE (y-axis) stratified by region (color), simulation and case (x-axis), and season (subplot) for hourly PM2.5, O3, and NH3 calculated from grid–grid pairs with respect to the orig simulation."

Figure 5 still has unsatisfactory quality (see "Presentation issues" in my comment from 11/10/2022). Variations between data shown in each plot are impossible to judge and bear no useful information. You show the differences to the *orig* simulation in subsequent Figure 6 anyway. Please keep only *orig* data in Figure 5, and therefore: make only three plots (for PM, O3, Ammonia) in one row, and present all seasonal values in each, respectively. In summary: Only *orig* data in 3 plots, 4 stacked bars each. Manuscript text in Sect. 3.3 should be adjusted accordingly (i.e. orig biases shown in Fig. 5, differences to these in Fig. 6).

Thanks for your comments. We respectfully disagree with your assessment "Variations between data shown in each plot are impossible to judge and bear no useful information. You show the differences to the *orig* simulation in subsequent Figure 6 anyway. Please keep only *orig* data in Figure 5, ...". Figure 4 and Figure 5 based on the same information, model against observations. Figure 5 shows the model performance (daily PM2.5, MDA8 O3, and two-week averaged NH3) against observations of the 12 reduced-precision cases side by side with the orig case with respect to different seasons and different regions in a stacked bar fashion. On the other hand, Figure 6 shows the grid-to-grid difference (hourly PM25, O3, and NH3) between each of the 12 reduced-precision cases and the orig case for the entire model with respect to different seasons and regions. In summary, we believe there are two reasons to keep Figure 5 in the manuscript as it is: Figure 5 shows model performance from a different angle which can be serves as an additional validation technique, from Figure 4 and Figure 5 shows a different comparison approach than Figure 6.

Please increase font sizes in Fig. 4, as during the production these will likely become unreadable.

We have increased the font size from 12 to 14.

Please go once more through the entire manuscript and carefully cross-check all table and figure numbers for consistency with the manuscript text.

Cross-checked.