Atmospheric Chemistry and Physics Discussions

Atmos. Chem. Phys. Discuss., referee comment RC1
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Comment on acp-2022-248

Anonymous Referee #1

Referee comment on "Predicting gridded winter $PM_{2.5}$ concentration in the east of China" by Zhicong Yin et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2022-248-RC1, 2022

In this manuscript, the authors integrated the emission and climate factors to establish the prediction model to provide gridded wintertime PM2.5 concentration in east of China. The results showed the model well reproduced both the trend and the interannual variation of PM2.5 concentration. The model also reproduced the significant decrease in PM2.5 after the implementation of strict emission control measures since 2013. I acknowledge that the accurate gridded PM2.5 prediction can support air pollution control on regional and city scales. The manuscript is well organized and clearly written, but some details and ambiguous presentation need more clarification. I recommend a minor revision and my comments are listed below.

Specific comments:

- Can you specify the reason why the study period varies between 2000-2020 and 2001-2019? As DY is the difference between the current and the previous year, the prediction period should be 2001-2020?
- Table 1: “SP-CE” should be “SP-EC”.
- Line 188-189: It is hard to find the center located in the Inner Mongolia.
- Line 193: “were similar to PC2” should be “were similar to PC1”.
- Line 210-211: Can you explain more here about how “The anomalous atmospheric circulation associated with PC3 and its predictors could enhance cold air invasion to NC but prevented the cold air from moving further south”?
- Line 224: Please add the units of RMSEs.
- Figure 5: Why is the range of PCs values different from those in Figure 2?
- Figure 8: You should indicate the unit of the shading in the figure or the caption.
- Line 282-283: “COVID-19 quarantines” occurred in 2020, not in 2019.