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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Spatiotemporal variability of NO_2 and $PM_{2.5}$ over Eastern China: observational and model analyses with a novel statistical method" *by* Mengyao Liu et al.

Anonymous Referee #2

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In this paper, the authors analyzed the spatial and temporal variability of ground level NO2 and PM2.5 in Oct-Dec. 2013, and evaluated model performance of GEOS-Chem and CMAQ on the spatial and temporal variability. The topic is important, the method is sound, and the results look reasonable. I suggest this manuscript be accepted as a discussion paper with some minor revision described below.

Revision suggestion: (1) The separation of SEC and NEC using Huai-River would be more appropriate, especially when considering the variability of NO2 and PM2.5 due to emissions and meteorology factors.

(2) The emissions used in GEOS-Chem and CMAQ are different and it adds more

complexity to illustrate the performance difference between the two models. Better to use the same emissions to eliminate this factor, or at least to discuss how this factor contributed to the difference

(3) If the too thick first layer of GEOS-Chem (130m) is the main reason for model underprediction, is it possible to configure the first layer to 80m as the CMAQ model so that you can provide direct proof to support your argument?

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