Atmospheric Chemistry and Physics Discussions

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Comment on acp-2021-709

Anonymous Referee #1

Referee comment on "Meteorology impact on $PM_{2.5}$ change over a receptor region in the regional transport of air pollutants: observational study of recent emission reductions in central China" by Xiaoyun Sun et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2021-709-RC1, 2021

The manuscript by Sun et al. analyzes the impact of meteorological factors on the changes in PM2.5 concentration in Twain-Hu Basin, China using a Kolmogorov-Zurbenko filter. They conclude that interannual and seasonal meteorology have the largest impacts on the changes in PM2.5. However, the method used in this work is not validated using synthetic data or with other methods, so the accuracy of the results is doubtful. In addition, this work focuses on a very small region, and the results may not have broader implications for national - global air pollution issues and may not fit the scope of the general ACP readership.

Abstract, please clarify why THB is selected as the studied region in this work.

L99-100, please clarify what the numbers in the subscript of KZ stand for and why using 1.7 years here.

L148-154, it is not clear to me how the authors verified this approach. How are the results compared to analyses using other methods? Could synthetic data be generated to test this approach?

Section 3.1, how are the results compared to other studies?

L196, what are the relative contributions of emissions and meteorology to the long-term changes in PM2.5 based on the analyses here?

L217-218, this can be testified by checking the trend of SO2 emissions in this region from the emission estimate. Do the emissions support your explanations here?