

## ***Interactive comment on “Filling the gaps of in-situ hourly PM<sub>2.5</sub> concentration data with the aid of empirical orthogonal function constrained by diurnal cycles” by Kaixu Bai et al.***

**Anonymous Referee #2**

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The submitted manuscript well fits within the journal scope as it is describing a method to fill missing values in hourly PM<sub>2.5</sub> concentrations for more than one thousand observational sites across China. Overall, the work is consistent and the method is well explained. Nevertheless, in my opinion, before publication, two points should be considered before publication.

1) The authors made a sensitivity study to assess how the number of neighbour stations impact the reconstruction of PM<sub>2.5</sub> concentration. However, it might happen that the spatial distribution of the neighbour station might influence the final result, i.e. in case of equispatially distributed or spreade. I suggest to perform a sensivity test for

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a couple of cases taking as metric the sum of euclidean distances using the same number of stations for the same aerosol loading.

2) it is missing how the measurement error is impacting the reconstructiion as all the mesurements are presented without errorbars.

English i should be revised as some sections are not very clear.

Specific comments are available in the attached file

Please also note the supplement to this comment:

<https://www.atmos-meas-tech-discuss.net/amt-2019-317/amt-2019-317-RC2-supplement.pdf>

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