

Interactive comment on “Meteorological modes of variability for fine particulate matter (PM_{2.5}) air quality in the United States: implications for PM_{2.5} sensitivity to climate change” by A. P. K. Tai et al.

Anonymous Referee #1

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This manuscript presents an analysis of the relationship between meteorology and PM_{2.5} over the USA. Using multiple linear regression and principle component analysis the dominant modes of variability controlling PM_{2.5} in different regions are identified. The manuscript contains numerous new results, and will be of interest to readers in ACP. It is well written, and I think it is acceptable for publication in its current form.

However, while I think it could be accepted as it is, I think the paper would be improved if more details were presented. Several key results are mentioned without any supporting figures or detailed discussion, and I think the authors should consider including a few more figures (see suggestions below). The analysis of the climate runs is also rather

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brief, and more analysis could also be added.

SPECIFIC COMMENTS

Pg 31043, lines 20-: This is one example of a place where additional figures, and some more discussion, would be very useful. An additional figure showing the synoptic maps of the phases of dominant mode (as in fig 6) for each region would help the reader see the differences / similarities between the different regions. It would also provide more support for statements made in the abstract and conclusions (e.g., pg 31047, line 20).

Pg 31044, lines 9-: Again, figures showing the different behavior in the Southeast would be very helpful to a reader.

Pg 31045, lines 15-19: How different are the statistics for your diagnostic of cyclones and that used by Leibensperger et al.? I imagine it would be relatively easy to apply your method to same region / period as in Leibensperger et al., and to show directly the (in)sensitivity to diagnostic used.

Pg 31046: The results from the climate runs is one of the papers major conclusions, but there is only 2 paragraphs discussing this analysis. Again I would prefer to see more results. In fact, I think this analysis could be expanded and form its own paper.

MINOR COMMENTS

Pg 31037, line 17: Why are the EPA data interpolated onto the model grid? Wouldn't it be better to interpolate met fields onto the location of the EPA data and perform the analysis on these locations.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 31031, 2011.

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