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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Contrasting impacts of two types of El Niño events on winter haze days in China's Jing-Jin-Ji region" *by* Xiaochao Yu et al.

Anonymous Referee #2

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Review comments for "Contrasting impacts of two types of El Niño events on winter haze days in China's Jing-Jin-Ji region" by Yu et al., (2020).

In this study, the authors tele-linked the El Nino events and wintertime haze pollution in Northern China. This study concludes that the occurrence of pollution is connected with El Nino modes. Generally speaking, the paper can be significantly improved with the inclusion of chemical research and discussions when dealing with the haze topic (e.g., the composition and the response by each species). This study is more like a purely statistical analysis with insufficient mechanism explanations. Moreover, the overall structure of this paper is somewhat mixed up and the English of this study needs some improvements. I have the following concerns before the formal publication of this study.

Specific comments:

1. This study emphasized haze days, however, without specifying the source of haze. For example, the chemistry here should definitely be discussed. Is PM the one to blame? If so, what is the composition? Also, when conducting the correlation analyses, what are the correlation to individual particle types? Any size distribution biases?

2. In this study, the Nino data used were provided by CMA. I am wondering what is the difference between the CMA Nino data and NOAA nino data? Authors should give more in-depth descriptions on the products they use.

3. The authors heavily relied on the ERA data for both ERA-40 and ERA-interim. Why not using the latest EAR5 data instead? I understand the ERA-40 is for older records but the ERA5 should be available for more recent years. Using state-of-art products boost the innovative part of this study.

4. The authors should expand section 2.3. The described method was very generic and details-lacking. It is very hard for readers to comprehend what has been done. Also, the first two paragraphs of 3.1 should be placed in the method section instead of the results.

5. It is hard to tell whether the correlation results shown in Figure 1 are significant or not as the highest correlation is around 0.5 for both positive and negative correlations. Can authors please justify the significance of these correlations numbers?

6. The caption of Figure 5 "The dots indicate that the differences between more than 60

7. Since this paper primarily focuses on the JJJ region, I would recommend authors to highlight the boundary of this region when making the plots, especially in zoomed-in cases (e.g., Figures 1, 2 and 5).

8. Authors, please check the right panel of Figure 3 for $CP_{year}. The lower whisky overlaps with 25$

9. This paper discusses the positive precipitation anomaly for the CP case. How about the precipitation for the EP case?

10. In Figure 1, I noticed one dot has distinctive signs between nino 3.4 and EP, shown below in square. Why is that the case? I assume these two regions shall be pretty close.

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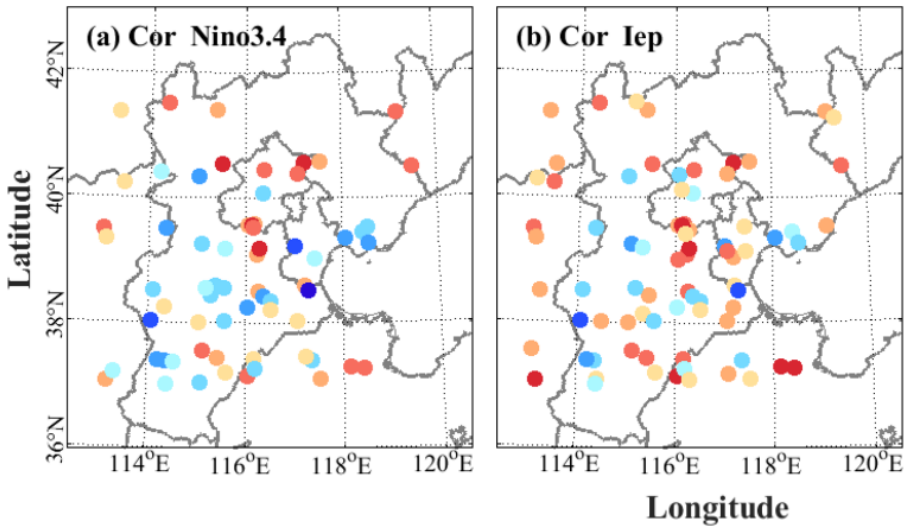

Fig. 1.