

Atmos. Chem. Phys. Discuss., referee comment RC2  
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## Comment on acp-2021-166

Anonymous Referee #2

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Referee comment on "Intensified modulation of winter aerosol pollution in China by El Niño with short duration" by Liangying Zeng et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-166-RC2>, 2021

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As mentioned in the review of this article, many scholars have conducted the relevant studies on the impact of El Niño events on winter aerosol pollution over China. However, there are some uncertainties in those studies and thus it is necessary to continue to carry out In-depth research to reduce the uncertainty. The ingenuity of this research is that the classification method is distinguished according to the life cycle (i.e. SD and LD) method instead of the traditional El Niño such as intensity, CP or EP of the El Niño. So this study is very meaningful, but it can still be further improved in the following aspects:

- The author can try to discuss the relationship and difference between the SD and LD classification methods and the intensity classification in previous studies or the CP and EP classification.
- Although the authors focused on the analysis of events in different seasons throughout the year when distinguishing between the SD and LD types of El Niño, when studying the impact of different types of El Niño on aerosol pollution, DJF is selected as the researched season, so I recommend the title of this article should be revised to **Intensified modulation of winter aerosol pollution in China by El Niño with short duration.**
- Previous study has shown (Sun et al., 2018) that GCM models have certain limitations to capture climate anomalies generated by El Niño, so there are usually some inconsistencies between the simulation results and the observation results. It is recommended that the author face up to these problems and discuss the uncertainty of the study.

Reference:

Sun, J., Li, H., Zhang, W., Li, T., Zhao, W., Zuo, Z., Guo, S., Wu, D., and Fan, S.: Modulation of the ENSO on Winter Aerosol Pollution in the Eastern Region of China, J. Geophys. Res. Atmos., 123, 11,952-11, <https://doi.org/10.1029/2018jd028534>, 2018.

