

# ***Interactive comment on* “Quantitative impacts of meteorology and precursor emission changes on the long-term trend of ambient ozone over the Pearl River Delta, China and implications for ozone control strategy” by Leifeng Yang et al.**

## **Anonymous Referee #2**

Received and published: 22 June 2019

The manuscript by Yang et al. describes the quantitatively statistical analysis of meteorology and precursor emissions impacts on ozone evolution in PRD region. The strategy of the analysis is clear and the manuscript has been relatively well organized for such a topic. This study presents an innovative approach to quantify the contributions of meteorological factors as well as non-local precursor emissions for ozone concentration in PRD. Besides, this study reveals the special distribution differences of ozone increase contribution under general conditions and ozone episodes, and uses a model to explain the difference result from emission control. Furthermore, specific

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suggestions are given in order to acquire high ozone reduction efficiency. Therefore it merits to be published in ACP. However, more detailed explanations are expected to make this manuscript complete and more convincing. In the following, I had a number of specific comments for the authors' reference to address before publication.

Specific comments:

1. It is confusing for the final sentence at the second paragraph of section 3.1. How to conclude the meteorological condition is the most important driving factor for ozone episodes through Fig. 3b?
2. In Fig. 4a, what is the legend of the color contour?
3. In the first paragraph of section 3.3, considering the monsoon climate, why local emissions have distinct impacts while non-local emissions are consistent?
4. In section 3.3, I would like to suggest the authors to further explain how to distinguish the non-local emissions from the impact of meteorological condition, as the PC1 is associated with northeasterly wind and meteorology has been removed in meteorological adjustment part.
5. What does the score mean in Fig. 5b and Fig. 6? I would like to suggest the authors add more explanations in figure caption for Fig. 5b and Fig. 6.
6. As SSR plays an important role in meteorology factors, I wonder if it is necessary to add the correlation of SSR with PCs?
7. In sections 3.3 and 3.5, long-term trends of local and non-local emission contributions on ozone is an interesting finding. The authors are suggested to provide in-depth discussion the influencing factors shaping the trends rather than simply describing them, both under general conditions and during ozone episodes.
8. There exist some uncommon usages of scientific writing English in the manuscript, such as Line 74 'such a philosophy' and Line 90 'is suffered from'.

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9. In Line 127,  $u$  and  $v$  are wind direction and speed respectively while in Fig. 6  $u$  and  $v$  both represent wind direction.

10. Some grammatical mistakes should be corrected, for example in Line 299, there should be a sentence after the word 'while'.

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Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2019-355>, 2019.

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