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Comment on acp-2021-1075

Anonymous Referee #2

Referee comment on "A machine learning approach to quantify meteorological drivers of ozone pollution in China from 2015 to 2019" by Xiang Weng et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2021-1075-RC2, 2022

Review of "A machine learning approach to quantify meteorological drivers of recent ozone pollution in China" by Weng et al.

The authors applied advanced statistical approaches to identify major meteorological drivers of ozone pollution over China. They also compared their results with the multiple linear regression methods. Moreover, they also found that by including the large-scale meteorology, their model skill will be improved relative to the model constructed by only local meteorological variables. Based on these regression models, the authors demonstrate the models' capability and advantage in the understanding of major meteorological drivers of ozone pollution and in the isolation of meteorological effects from observed ozone trends.

Ozone pollution issue in China is of great concern. This study adds insights into the better understanding of recent ozone trend in China. I think the major novelty of this work is its new methods. However, several places should be improved in order to highlight this strength. Please find my comments below.

The Abstract should be revised. Firstly, I am surprised that there are almost no quantitative sentences to show the advantages of the machine learning approach. It prevents the readers from easily understanding the contribution of this work in current version. Then, a large fraction of the Abstract is the description of leading meteorological variables. However, these results are not new and have been reported by a lot of studies previously.

Section 3.4. As I mentioned above, this section shows a lot of previously-reported knowledge on the major meteorological drivers of ozone pollution. I suggest the authors to make this concise and to highlight your new findings.

Section 3.5. Another contribution of this work is the quantification of meteorological role in ozone trends. However, I failed to find the comparison between machine learning method and MLR method in this Section. At least, I suggest the authors to list the MLR-based estimates in Table 3.

The “recent” in the Title is not clear. It is better to be replaced by “2015-2019”.

L41: Brief information on VOC emission changes should be added.