

Atmos. Chem. Phys. Discuss., referee comment RC1  
<https://doi.org/10.5194/acp-2022-493-RC1>, 2022  
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## Comment on acp-2022-493

Anonymous Referee #1

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Referee comment on "Examining the implications of photochemical indicators for  $O_3$ - $NO_x$ -VOC sensitivity and control strategies: a case study in the Yangtze River Delta (YRD), China" by Xun Li et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2022-493-RC1>, 2022

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The values of photochemical indicators are widely used to determine the  $O_3$ - $NO_x$ -VOC sensitivity with measurements, which has important policy implications. This work examined the effectiveness of four indicators such as  $PH_2O_2/PHNO_3$ , and surface  $HCHO/NO_2$  with air quality models. It can provide decision-makers with some useful information when they use the photochemical indicators to make control strategies. The manuscript is well written and fits the scope of ACP, which is worthy of publication. However, there are a few questions as follows that need to be addressed to further improve the manuscript.

Major comments/questions:

- What are the influences of regional transport on the results?
- How will  $NH_3$  and inorganic aerosols such as sulfate, nitrate, and ammonium affect the  $HCHO/NO_y$  and  $NO_y$ ?

Some minor issues:

Page 2 line 45: “, the O<sub>3</sub> to nitric acid ratios (O<sub>3</sub>/HNO<sub>3</sub>), and NO<sub>y</sub>)”

Figure 1. The letters are skewed.

Page 6 lines 138-140: Why are the 95<sup>th</sup> percentile for the VOC-limited grids and the 5<sup>th</sup> percentile for the NO<sub>x</sub>-limited grids chosen as the boundaries of the transition interval?

Page 11 lines 240-242: I suggest moving this part to the methodology section.

Page 14 lines 295-296: This seems to conflict with your argument that the emission had no significant influence on the thresholds of PH<sub>2</sub>O<sub>2</sub>/PHNO<sub>3</sub>.

The first row of Table 4 was incomplete.

Lines 450, 491, 521: The format of journal names should be consistent.