

Atmos. Chem. Phys. Discuss., referee comment RC2
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Comment on acp-2021-291

Anonymous Referee #2

Referee comment on "Identifying the spatiotemporal variations in ozone formation regimes across China from 2005 to 2019 based on polynomial simulation and causality analysis" by Ruiyuan Li et al., Atmos. Chem. Phys. Discuss.,
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Li et al. incorporated ground-based observation networks and remote sensing datasets to investigate the spatial and temporal variation of ozone transitional regimes from 2005 to 2019. Given the rising concern of ozone pollution to public health in China, this work is timely and very relevant to the scope of ACP. The manuscript is well organized and neatly presented in its methods and results. I have the following comments and suggestions for authors to further improve this work.

- The novel insights and research contribution of this study should be better articulated. From the results and discussion section, I found several statements "Page 7, lines 202-203: the variation trend of HCHO agreed well with previous studies (Jin and Holloway, 2015; Shen et al., 2019b)", "Page 7, lines 207-208: which was consistent with previous studies (Jin and Holloway, 2015; Li et al., 2019a)", "Page 10, line 291: our findings were generally consistent with previous studies". It would be better to highlight the position of this study and further justify the research advance, e.g., regarding the methods and datasets, or a more comprehensive picture of ozone formation regimes in China.
- The authors set the implementation of Clean Air Action in 2013 as the breakpoint, which is appropriate for the comparison between these two baselines. However, the contribution from this policy to driving the decreased NO₂ should be acknowledged in a more systematic and quantitative way, by adjusting a number of confounding factors.
- The scaling biases between the station-based observations (i.e., point) and remote sensing based measurement (i.e., 0.25-degree footprint) should be discussed, especially for heterogeneous land cover/land uses.