

Atmos. Chem. Phys. Discuss., referee comment RC2
<https://doi.org/10.5194/acp-2021-764-RC2>, 2022
© Author(s) 2022. This work is distributed under
the Creative Commons Attribution 4.0 License.

Comment on acp-2021-764

Anonymous Referee #1

Referee comment on "Atmospheric oxidation capacity and ozone pollution mechanism in a coastal city of southeastern China: analysis of a typical photochemical episode by an observation-based model" by Taotao Liu et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-764-RC2>, 2022

AOC is key to photochemical reactions and the formation of secondary components like O₃ and secondary organic aerosol. This study uses OBM to understand the AOC in a coastal city in China during a typical photochemical episode. It is well organized and suitable for publication in ACP. I have below comments for the authors.

- OBM is good for understanding the local photochemical formation of O₃, but it is not good to evaluate the transport, while back trajectories cannot quantify the contributions. Thus, it is important to show the method of how the regional transport contribution is determined. In this study, the differences between observed O₃ changes and local formation were treated as regional transport, which is very misleading. A better method representation should be physical processes instead of regional transport.
- CO looks very important in OH reactivity, a quick search showed me that it is quite different from other countries, please add comparison or discussion why it is high in this study. (CalNex-LA, BEACHON-SRM08, DISCOVER-AQ)
- The episode is just one high O₃ event, thus, not necessarily the whole story of O₃-NO_x-VOCs relationship. It should be cautious when making policy implications.
- From Figure 11, the R_{tran} is mostly opposite to the R_{chem}, which means local formation and so-called regional transport do not work together to cause high ozone events. The conclusion that "regional transport aggravated the pollution of ozone" is not accurate.
- Some expresses are not in scientific mode, for example, 1) In Abstract, "were the important primary sources of ROX", O₃ and HCHO are not emission sources, so not proper to use primary. 2) how the uncertainties are calculated? OH contributed to 91±23%, at what cases, you have a larger than 100% contribution?