

Atmos. Chem. Phys. Discuss., referee comment RC1
<https://doi.org/10.5194/acp-2021-476-RC1>, 2021
© Author(s) 2021. This work is distributed under
the Creative Commons Attribution 4.0 License.

Comment on acp-2021-476

Anonymous Referee #1

Referee comment on "Recent ozone trends in the Chinese free troposphere: role of the local emission reductions and meteorology" by Gaëlle Dufour et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-476-RC1>, 2021

This paper addresses important issues for understanding the evolution of ozone pollution over China and how it is responding to air quality regulations. This is a complicated problem so although this study does not resolve discrepancies between data sets, it is a careful analysis and represents an advancement in our understanding of Chinese ozone pollution. I recommend publication once minor issues are addressed.

Specific comments:

p5 line 8: I could not find references at <https://quotsoft.net/air/> regarding the accuracy and precision of this data. Please provide more information and/or other references that use the data.

p7 line 1: Zheng et al., 2018 uses the MEIC inventory – I assume that also used here? This should be stated explicitly since there are other bottom-up inventories for China, e.g., as mentioned in Zheng, B., et al., (2018), Rapid decline in carbon monoxide emissions and export from East Asia between years 2005 and 2016, *Environ. Res. Lett.*, 13(4), 044007, doi:10.1088/1748-9326/aab2b3.

p8 line 12: Could the lower bias and degraded correlation with IASI-IAGOS compared to IASI-ozonesondes also be related to the assumption of a vertical profile at the lat/lon of the mid-point in a slanted profile? This might explain the low bias in the lowest layer since those measurements would be taken closer to urban areas near the airport.

Fig. A1: In addition to the 2014-2017 mean and statistics, it would be useful to see the trends in ground station observations compared to the model surface ozone.

Wording change suggestions:

p2 line 15: "have been applying" to "have been enacted"

p3 line 3: "In this study, we question the ability..." to "In this study, we examine the ability..."

p3 line 8: "Results are also discussed in light with the TOAR outcomes" to "Results are also contrasted with the Gaudel et al., (2018) TOAR outcomes"

p4 line 28: Since validation references are not given in this section, I suggest adding a line: "Initial validation of the KOPRAFIT IASI ozone retrievals with ozonesonde and IAGOS data is presented in Section 3."

p8 line 14: "worsen" to "lower"

p9 line 23: "less than 300 data" to "less than 300 profiles"?

p11 line 19: "desertic" to "desert"

p11 line 21: "This region should not be considered here." to "This region is not considered here."

p11 line 24: "This translates even stronger to the model" Not quite sure what is meant by this- maybe "This feature becomes even stronger in the model when AKs are applied"?

p17 line 2: "nudging" to "nudging"

p19 line 20: "These results seem to comfort the consistency" to "These results corroborate the consistency"

p19 line 25: "and the caution to take to not overinterpret the results" to "and the need for caution to prevent overinterpreting the results."

p20 line 12: "Some individual studies exist but once again they do not allow one to conclude" Conclude what?

p21 line 23: "leads to reduce" to "further reduces"