Atmospheric Chemistry and Physics Discussions

Atmos. Chem. Phys. Discuss., referee comment RC1
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Comment on acp-2022-627

Anonymous Referee #1

Referee comment on "Ground-level gaseous pollutants (NO_2, SO_2, and CO) in China: daily seamless mapping and spatiotemporal variations" by Jing Wei et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2022-627-RC1, 2022

Wei et al. estimated long-term daily seamless different ground-level gaseous pollutants with high accuracy using machine learning and big data by combing monitors, satellites, and models. The public dataset are important to study air quality in China and also have been widely adopted in public health-related studies. The study is well organized and the results are well presented. However, the manuscript still suffers from some flaws. I recommend the manuscript for publication after the following comments are well addressed.

Major comments:

- The authors have constructed many air quality dataset (e.g., PM_5, PM_{10}) across China. Please introduce the novelty of this study compared with previous studies. I think it is essential to add these contents in the introduction.
- The authors should discuss the limitations of this paper and prospects for future work in the conclusion. The development of high-resolution dataset might not be the final aim.

Specific comments:

Line 41-43: Please spell out these abbreviations, e.g., NOx, VOCs, et al. Also, please double-check and correct such issues throughout the paper.

Lines 48 and 54: Should be MEE and WHO.

Lines 64-69: The authors are suggested to highlight the main purpose and provide more

descriptions of the main work here to enrich the Introduction.

Lines 83-88: A long sentence suggests splitting.

Line 97: 0.1° × 0.1°?

Figures 2 and 3: Please clarify which cross-validated method was used.

Section 3.2.3: Besides annual variations, it is also interesting to see how three gaseous pollutants changed in different seasons on both the national and regional scales during the study period.

Lines 286 and 294: References are needed to support the evidence here.

Figures 9 and 10: Since the air quality guidelines have been newly updated in 2021, it is suggested to show the spatial distributions and variations of the percentage of polluted days exceeding both the WHO recommended long-term and short-term AQG levels and interim targets.