

Re: We thank the Editor and the Topic Editor's comments on our manuscript. We have carefully taken your comments into considerations in preparing our revision, and below marked in blue is our response to your comments point by point, or you can see the revised manuscript for more details. Thanks again for your comments.

Specific:

Editor (Sarah Buchmann) :

Your figures #3 and #9 are very low in quality and this is why, some parts are not even readable when zoomed in. For the next revision, please change these figures with higher quality versions.

Re: Thank you for your comment, the quality of figure #3 and figure #9 are improved now as show in below, and these figures have been updated in the revised manuscript.

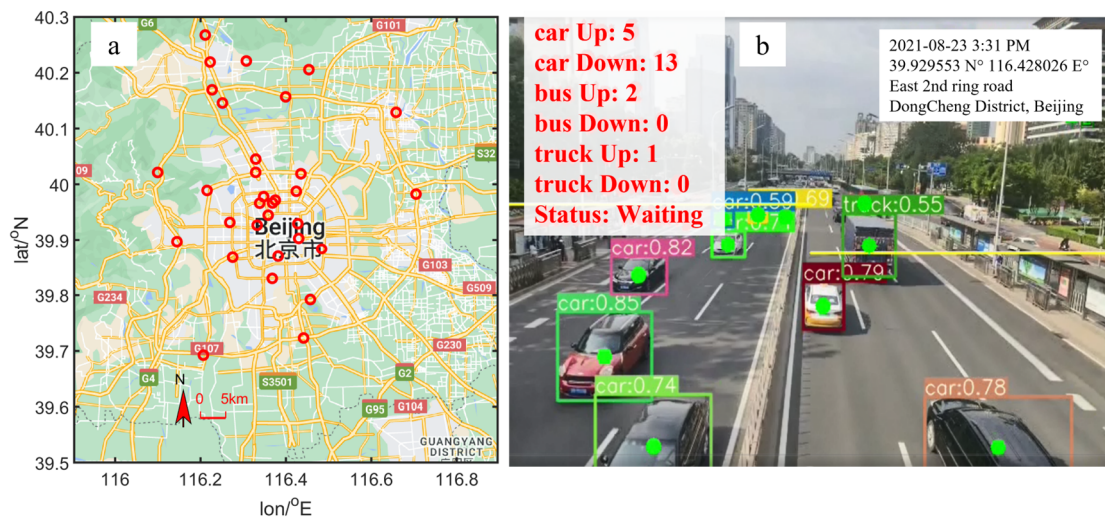


Figure 3. (a) Locations of observation sites on different roads for vehicle information (Imagery © 2022 Google, map data © 2022 Google). (b) Detection results of vehicles on road by the YOLO system.

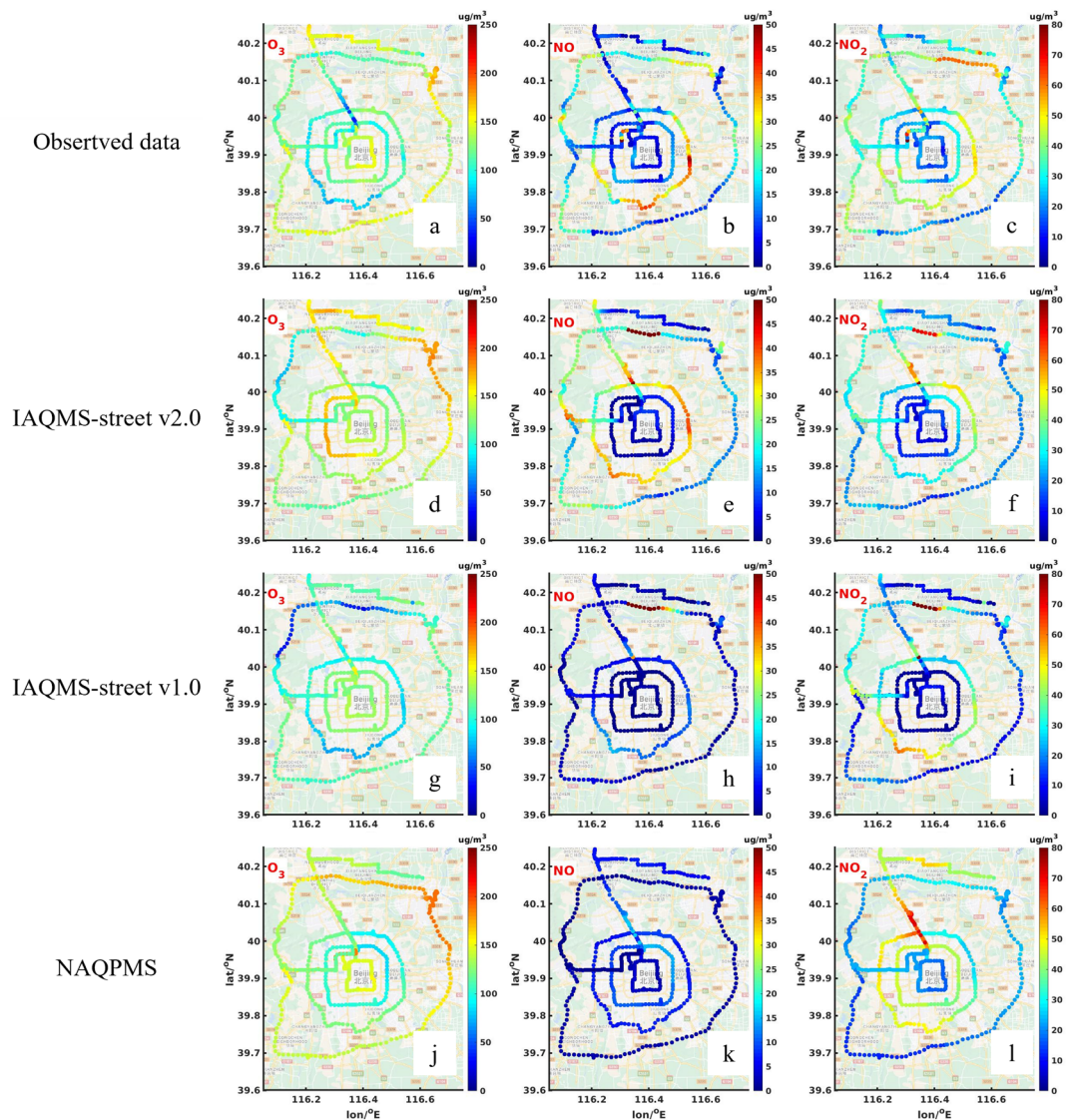


Figure 9. Horizontal distributions of the observed O₃ concentration (a), NO concentration (b), and NO₂ concentration (c) at the street scale and simulation results by the two-way coupled model in IAQMS-street v2.0 (d–f), IAQMS-street v1.0 (g–i), and NAQPMS (j–l) (Imagery © 2022 Google, map data © 2022 Google).

Topic Editor (Leena Järvi) :

1. Thank you for your good work concerning the reviewer comments. There are a few corrections still needed before I can accept the manuscript for publication. The language in the new section 2.5 needs to be improved: there are several mistakes so carefully check it through.

Re: Thank you for your comments. We appreciate the editor’s positive evaluation of our work. Based on editor’s comments, The section 2.5 has been revised to:

“In the base scenario (S1), the time step was set as 20 min in IAQMS-street v2.0. An additional simulation scenario was set with a time step of 5 min in IAQMS-street v2.0 to analyze the influence of the time step in the coupled model. The comparison of simulated pollutants in IAQMS-streetv2.0 with different time

steps is shown in Fig. S3 and Fig. S4. The FAC2 between simulation results of O₃, NO, and NO₂ for the time step of 20 min and 5 min reached 0.99, 0.97, and 1.0. The NMB of O₃, NO, and NO₂ is 0.03, 0.11, and 0.03. Overall, the simulation results based on a 20-min time step can achieve similar simulation accuracy with a smaller time step of 5 min. The results showed that the simulated pollutants are numerically stable in the coupled model with nonstationary approaches, which is consistent with the previous research findings (Lugon et al., 2020).

In terms of computational time, the NAQPMS used 4 nodes and 24 ppn (Processor Per Node) while MUNICH used 1 node and 28 ppn in this study. During the study period, the calculation time was 121.6 h in IAQMS-street v2.0 and 96.2 h in IAQMS-street v1.0, and the calculation time increased to 212.8 h in IAQMS-street v2.0 with a smaller time step of 5 min, which means that the smaller the time step, the longer the computation time.”.

Please see the revised manuscript for more details.

2. L198-199: The reference YOLOv5s should be updated so that the github link and date of access are in the reference list and not in the main manuscript following the editorial guidelines.

Re: Based on the editorial guidelines, the reference to YOLOv5s has been updated, and the Zenodo link and date of access are included in the reference list as follows: “Jocher, G.: YOLOv5 by Ultralytics (Version 7.0), Zenodo [Code], <https://doi.org/10.5281/zenodo.3908559>, 2020, last access: 13 August 2023”. Please see the revised manuscript for more details.

3. L421: Similarly the Zenodo link to the dataset Wang and Li, 2022 should be in the reference list as Tao Wang, Jie Li, & Zifa Wang. (2022). IAQMS-street online model data. <https://doi.org/10.5281/zenodo.7298948>

Re: The Zenodo link of the dataset used in this study has been added in the reference list as follows: “Wang, T., Li, J., and Wang, Z. F.: IAQMS-street online model data, Zenodo [data set], <https://doi.org/10.5281/zenodo.7298948>, 2022.”. Please see the revised manuscript for more details.

4. There are multiple mistakes in the reference list with paper names in capital letters, references Ministry of Ecological Environment of China. are not referred in the main text etc. Please check all references carefully.

Re: The reference list has been checked now and the references of Ministry of Ecological Environment of China have been removed from the reference list. Please see the revised manuscript for more details.

Date of this revision:

13 Aug 2023