

## ***Interactive comment on “Street-scale air quality modelling for Beijing during a winter 2016 measurement campaign” by Michael Biggart et al.***

**Anonymous Referee #1**

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In this manuscript, the authors use the Gaussian pollution dispersion and a chemistry model named ADMS-Urban measured the street-scale resolution concentrations of NO<sub>x</sub>, NO<sub>2</sub>, O<sub>3</sub> and PM<sub>2.5</sub> in Beijing. They construct a traffic emissions inventory, and this method improves the consistency of simulation data and measurement data of Beijing's air quality monitoring network and the Institute of Atmospheric Physics (IAP) field site. ADMS-Urban model can solve the sharp concentration gradients adjacent to major roads. This manuscript can provide valuable information for evaluating the street-scale air quality. The following advices hope to attract your attention.

Q1: Several articles have been quoted many times in the introduction. It is recommended that multiple references be cited to reflect the amount of reading and to enhance the persuasion.

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Q2: The novelty of this work should be highlighted in the introduction. I suggest present in the last two paragraph.

Q3: The introduction is long and unclear. You should summarize the advantages and disadvantages of various methods at the end to highlight your innovation points of the article.

Q4: Line 134, don't quote the two references separately, insert them at the end of the sentence.

Q5: Line 144, please explain the reason for using hourly wind direction and speed.

Q6: Lines 229-231, datas should be provided to support the point.

Q7: It is suggested that the idea of Sect. 3.3 should focuses on the comparison of the simulation results of the MEIC-Std and MEIC-Opt two emissions inventories. On this basis, the specific conclusions are explained.

Q8: The title should be placed on the top of the table, as shown in Table 1 in the 1163 line. Please correct it in sequence.

Q9: How to modify the PBL stability parameters should be detailed in Sect. 2.1.2 rather than just in results , and should referenced with the conclusion.

Q10: Note some details to the format of the paper. Such as: Please change the font in formula 4 into italics. The last name in the legend in Fig 1. is incomplete. The “:” and “.” behind Fig 1. and Fig 2. should be consistent.

Q11: Line 560 “The corresponding F<sub>b</sub> value improvement, at urban sites, from. . . .” It is should tell the reader more clear that why the F<sub>b</sub> can reflect the traffic emission (for different range)? And some references should be cited.

Q12: Line 570 “Little change is seen across suburban areas with the inclusion of explicit road source emissions, reflecting the lower density of roads and more dominant contribution from diffuse emissions with distance away from Beijing's urban centr” Please

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make more explanation.

Q13: Line 620: “The results suggest that although atmospheric stability has a strong impact on NO<sub>2</sub> concentrations, the use of observed PBLH instead of modelled heights has little effect”. This conclusion should be extended.

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Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2019-783>, 2019.