

Review of the paper entitled “The underappreciated impact of emission source profiles on the simulation of PM2.5 components: New evidence from sensitivity analysis” by Zhongwei Luo et al.

This article investigates the influence of source profile changes used in the chemical transport model on the simulation of PM2.5 chemical composition. The research results are convincing and have significant implications for improving the simulation effect of chemical transport models. I recommend the acceptance for publication after minor revisions. Several editorial comments for improving the information content and presentation of the paper are listed as follows.

Comments:

1. Abstract:

The sentences in the abstract part are almost exactly the same as those in the conclusion part of the text. Please try to avoid this situation and make appropriate modifications.

L26-29: It is unnecessary to have these sentences regarding the aims of this paper in the abstract. Please remove them.

L32: it should be “.....PM2.5 concentrations”. There are many English errors in the text part. Please correct all of them before publication.

2. Model configuration :

You used the MEICv1.3 source emission inventory. This type of emission inventory can vary greatly from year to year, which can have a significant impact on the simulation results. Please provide additional information on which year's emission inventory was used and explain the reasons.

L138-140: Regarding the CMAQ, more references are needed such as (1) Eder, B., and S. Yu, 2006. A performance evaluation of the 2004 release of Models-3 CMAQ. *Atmospheric Environment*, 40: 4811-4824. (2) Yu, et al., 2014. Aerosol indirect effect on the grid-scale clouds in the two-way coupled WRF-CMAQ: model description, development, evaluation and regional analysis. *Atmos. Chem. Phys.* 14, 11247–11285, doi:10.5194/acp-14-1-2014.

3. Fig.3

Why are there Chinese characters in the picture?

4. There are some English grammar errors such as

L262: It should be “...p **is** the...”.

L266: It should be “...the value **is** close...”.

L337: It should be “Evaluation index for simulation results”.

L356: It should be “...the simulated results of...”.

Please correct other English grammar errors in the text.

5. Part 3 (L274~277,P13):

Please provide additional information on the specific location of the site you have chosen and explain the reason for your choice.