Review of V2 of ‘A modeling study of impact of emission control strategies on 1 PM2.5 reductions in Zhongshan, China using WRF-CMAQ’ by Jianhua Mai et al.

Although the subject of the paper is of general interest and I support the publication of the paper, the paper cannot yet be published in its current form. There are still several weaknesses in the revised manuscript. Although these are sometimes just minor, addressing them will significantly improve the quality and the benefit of the paper. In particular, important information is still missing at several places, some sentences appear a bit out of context, and the language quality must be improved significantly. I recommend consulting a native speaker or a language support service.

Specific comments:

1) Not all previous reviewer comments are addressed properly in the revised paper.

For example, I could not locate the information related to point 2 of the review in the

revised paper.

Point 3: Lines 115 to 117 of the revised paper do not describe very how the emissions

for the 9 km grid were prepared exactly. If it was just by interpolation (which is what I assume when looking at Fig. 2) then please mention this.

Point 11: The question if answered properly in the reply to the comments. However,

lines 379 to 381 of the revised paper do not include this information.

Answer: The information for point 2 is located in lines 100 to 102 (please correct the line numbers before you send out if these numbers are changed later). The information for point 3 is in lines 124 to 126. And the information for point 11 is addressed in lines 341 to 344.

2) Lines 89 – 90: As the results of the WRF simulation will depend to some extent to the applied physics options, please add this information in an appendix.

Answer: A new table (Table 1) is added to present such information. The explanation about the physics options is given in Line xxx2-xxx2.

3) Fig. 1: Is b) identical with the nested CMAQ domain? If not, it would be better to plot the three emission categories for the CMAQ domain – and please mention this in the figure caption.

Answer: Fig.1b is re-plotted for the CMAQ domain and it is mentioned in the figure caption (lines 100 to 101). (Did you understand the reivewer’s question?)

4) Caption of Fig. 2: Please mention which domain is shown.

Answer: The information is added to caption of Fig.2 (lines 135 to 136).

5) Fig. 3: Axis labels for the Pressure Difference are different from the other figures.

It is really difficult to locate a certain date when looking at the curves in Fig. 3. Please consider adding some vertical lines to lead the eye. Or mark the days with cold front activities by shaded areas.

Answer: The axis labels for the Pressure Difference are changed to fit other figures in Fig. 3 and some vertical lines are added to lead eyes.

6) Line 196: ‘So data from those four sites are processed to match with the model output’. What does this mean exactly?

Answers: This sentence is changed to “So data from those four sites are averaged for model evaluation as well as the model output of the grids where the four sites located” (lines 203 to 204).

7) Lines 210 ff.: It is very hard to see the mentioned features in the figures (see also comments related to Fig. 3).

Answer: Some vertical lines are added in Fig.4 in order that the reader can get the features in the figure easier.

8) Line 219: I cannot see that the model can capture the observed patterns very well. As visibility is not only related to the PM2.5 concentrations but also to humidity (a discussion about the visibility should also include some information how optical properties of the aerosol and visibility is calculated in CMAQ, the dependence between aerosol water and relative humidity etc.).

Answer: The discussion about visibility is not very important in this paper. As the point of the reviewer, visibility is not only related to the PM2.5 concentrations. So we decided to remove all content about visibility in the paper. (It is not wise to argue with reviewer. Please follow the reviewer’s comment to add the information how optical properties of the aerosol and visibility is calculated in CMAQ. Please provide answers here and in the text).

9) Fig. 4: See comments on Fig. 3.

Answer: Some vertical lines are added in Fig.4 in order that the reader can get the features in the figure easier.

10) Table 2: Please add correlation (and also some remarks in the text).

Answer: Correlation is added in Table 3 and also some remarks about correlation are added in the text (lines 232 to 247).

11) Fig. 5: The blue color is not very favorable for reading the names of the cities in the figures.

Answer: Fig.5 is re-plotted for easier reading.

12) Lines 303 -304: The second sentence is somewhat out of context.

Answer: This sentence (now in lines 301-302) is necessary because it explain why the model overestimates the cross-region transport.

13) Table 3: % of what?

Answer: This part of content is removed from the paper.

14) Lines 317 – 326: The paragraph about the visibility (and the first sentence in particular) is somewhat interrupting the discussion about PM2.5. The paragraph just includes very general statements and is not necessary anyway. Please consider to remove it or to move a much more in-depth discussion at the end of section 4.2.

Answer: This part of content is removed from the paper.

15) Line 337: Why does aging decrease PM2.5 concentrations?

Answer: aging is removed from the text.

16) Line 356 – 367 and Table 4: It is not clear, what the authors mean by 1st day. 2nd day, 3rd day. Is it the day after the passage of a cold front? Was the reduction estimated by an extra simulation or estimated by an analysis of the monthly run? Was a single 3-day episode considered, or is this an average of several (how many) 3-day episodes? Please describe in more detail.

Answer: More details about the sensitivity simulations are given in lines 339 to 344 and Table 4. (Please answer the question one by one carefully, provide all answers here and change in the text with line numbers)

17) Section 4.4 is quite short, better merge it with 4.3. Furthermore, 4.4 is mostly introduction and does not contain many results.

Answer: Section 4.4 is merged with Section 4.3 and the subtitle of Section 4.3 is changed to “**Impact of local emission controls under no cold front condition**”.

18) Lines 381 – 383: According to Table 5 the contribution of residential emissions is almost as large as the industrial emissions. Could changes in domestic heating also help to mitigate high PM2.5 concentrations?

Answer: Of course the control of domestic heating helps to mitigate high PM2.5 concentrations. But this only happens in northern part of China because there is no domestic heating in southern China.

19) Lines 413 – 414: This holds only for the conditions of the considered episode. Therefore, please add restrictions (not only here).

Answer: Such restrictions are added in lines 31 to 35, lines 361 to 362, and lines 394 to 396.

20) Reference 29: Please cite the developers and not just an application.

Generally, there is an extreme preference for Chinese references in this paper.

Answer: Reference 29 is replaced for a new article. There are 36 references in this paper but only two of them are in Chinese.

21) Various locations: ‘No cold front’: Does this mean ‘stagnant conditions’. Please clarify (if appropriate).

Answer: We give a criterion of ‘no cold front’ using the pressure difference in lines 284 to 285. Of course in most time ‘no cold front’ means ‘stagnant condition’, but we used ‘no cold front’ in the text to compare with the ‘strong cold front’ case.

Language Issues: ‘play higher contributions’, ‘In specific’, ‘have showed’, ‘a month 16 haze episode days’, ‘high concentration of PM2.5 plume’, etc.: Please improve the language quality.