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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Modeling tropospheric O_3 evolution during the 2016 Group of Twenty summit in Hangzhou, China" *by* Zhi-zhen Ni et al.

Anonymous Referee #1

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The authors used regional chemical transport model to describe the evolution of ozone formation in an urban city. They studied the different characteristic of the ozone formation before, during and after tropical cycle passing by, and also explained the possible cause for the high ozone at the urban city even when strict air pollution controls were carried out. In general, the paper is not well summarized, but the explanations were also poor. Time should also be spent to describe their methodology on the emissions, and the model setup. Please see my comments below. Also the authors need to keep consistent for the tense used in the main manuscript. The authors keep switching from present to past tense in the whole paper.

Specific comments:

line 25: define O3.

line 28-29: explain what is the new mechanism. Otherwise, rewrite this sentence.

line 30: change "are" to "were";

line 32: change "intensify" to "intensified";

line 52: define O3Âň Âňand CO; put reference for line 52-53

line 55-58: surface ozone is not considered as climate forcer, but actually the tropospheric ozone. Please modify.

line 75-76: rewrite the sentence.

line 81: suggest to change the reference to Lin et al., 2012, 2015.

Line 101: define WRF-Chem as it was first shown here;

Line 111-113: I was confused by what data was actually used here, and what is the purpose.

Line 115-116: Does the U.S. Geological Survey database includes the terrain soil properties, and albedo info for China? Please clarify. Also, please detail the interpolation process.

Line 120-122: put reference for the FNL dataset.

Line 123-125: describe the simulation period & setup for the MOZART4 simulation which was used to provide the BCs and ICs for the WRF-Chem runs. Does the dynamical BCs were adopted from MOZART4, or only profile data used?

Line 129-130: which year's emission inventory from MEIC was used in this study?

Line 131-133: the authors should describe in detail how they get the finer emission inventories, and how did the O3 precursors look like. Suggest add a table to show the results.

Line 136-137: for the biogenic emissions from MEGAN, describe the online or the

offline version was used for this study.

Line 152: suggest to change “model result” to “model results”

Line 158-159: suggest to change to “the meteorological parameters were also evaluated with the observational data, including ”

Line 163-164: put reference for the LiDAR data.

Line 167-168: not a complete sentence.

In Fig. 2: describe the figures a, b and c,d, as “scatter plots for the MFB and MFE... scatter plots for daily observed and modeled O3 (c) and NO2 (d)”. Line 179: change “evaluate” to “evaluated”

Line 181: change to “agreed”

Line 182: add “as” in front of shown in fig 2.

Line 183: Fig 2c has nothing to do with MFB and MFE. Consider to remove. The same as line 185

Fig 3. Describe the observational data used for evaluating the model performance in Hangzhou.

In fig 6, in the captions, please detail the heights in each plot. The Y axis on the plot e-h is NO2, which is different with the NOx listed in the caption. Add the units of O3 for plot a-d in the caption.

Line 228: “The O3 concentrations increased in the daytime” I did not understand how the authors made this conclusion from Fig. 6.

Line 230-245: remove the hyphen between numbers and “hPa”

Line 244-245: “This result is in contrast to the O3 variation found in the vertical layers.” Put reference for this sentence. Also explain why the differences are.

Line 345-347: this study is not representative of major urban ozone pollutions.

In the supplementary:

Page 1: keep the title consistent with main manuscript

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