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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Effectiveness of short term air quality emission controls: A high-resolution model study of Beijing during the APEC period" *by* Tabish Umar Ansari et al.

Anonymous Referee #2

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Major comments:

1. The APEC emission control analysis (Section 5) is a bit confusing in terms of writing and additional modeling analysis is needed to support the authors' conclusion that meteorology played a more important role for good air quality during APEC. First, I suggest the authors put a summary at the beginning of the section to state their overall strategies to separate the relative role of emission control vs. meteorology. Second, to put this analysis in the context of previously published ones, I suggest the authors conduct a sensitivity run in which the emission reductions are implemented over the whole study period (Oct – Nov). The resulting changes in PM2.5 concentrations should be

compared to the 22% change the authors estimated. If the comparison is satisfactory, it can demonstrate the authors' simplified method is justified and such a method can be adopted by others.

2. On the evaluation of model meteorology (Section 3), I suggest the authors add a paragraph or two to state what meteorological factors/conditions are most different between the APEC and non-APEC period and to what extent the WRF model can reproduce such differences.

3. I concur with the first reviewer that the manuscript is too long and particularly the tables are tedious and do not add substantial values to the manuscript. I suggest Table 2-4 can be shortened (e.g. showing only the inner domain) and put the rest in the supplementary.

Minor comments:

1. The first line of the abstract: add "short-term" before emission controls.

2. Pg 3, line 15: the statement on little SOA response to emission changes is too assertive with only one reference as support. In fact, I don't agree with this statement because (1) emission controls can affect the biogenic-anthropogenic interactions (NOx-BVOC) which affect SOA and (2) there is considerable uncertainty surrounding the role of anthropogenic VOC emissions on SOA in China. Thus, I suggest the authors change the tone of the statement and acknowledge the uncertainty in their modeling exercise due to omitting of SOA.

3. Figure 2 and Figure 4: (1) label the APEC period; (2) add the month on the x-axis

4. Pg 9, line 9: the November period should be the October period.

5. All the time series figures should have the month on the x-axis.

Grammar:

1. Pg 2, line 6: add comma before modeling.

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