

Interactive comment on “An important mechanism of regional O₃ transport for summer smog over the Yangtze River Delta in East China” by Jun Hu et al.

Anonymous Referee #1

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General comments

In this work, the authors used WRF-Chem modelling system to simulate ozone and its precursors in YRD region in China, and analyzed the mechanism of regional ozone transport in a severe photochemical pollution episode. The combination of observation data and mode simulation illustrates the important mechanism of O₃ transport from the upstream to the downstream through the residual layer in the Yangtze River Delta region, which is of great significance for understanding the summer daytime O₃ pollution. The manuscript is well organized and the methodology is feasible, and it may be of great interest to the China's ozone modelers and the local governments. How-

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ever, there are some problems in the simulation and discussion (as shown below). I recommend the publication of journal ACP after the problems were clarified.

Specific comments

1. Abstract should state briefly the purpose of the research, the principal results and major conclusions. Therefore, I suggest the author to rewrite the abstract, avoiding some unimportant statements.
2. The validation of the vertical profile of ozone (or column ozone concentrations) is very important in the analysis of ozone budget, but missing in this study. The reviewer suggests that the evaluation of ozone characteristics and budget should be conducted using not only surface measurements but also aircraft and/or column measurements.
3. In addition to temperature and radiation, wind direction and speed also important meteorological factors for ozone pollution. I recommend the authors adding the statistics of wind in Table 2 and interpreting the difference in the manuscript.
4. Vertical mixing and chemical production are two main factors for ozone difference between 24 and 25 Aug. However, the authors forgot the other factor – dry deposition. I recommend the authors showing the difference of dry deposition in different days.
5. As the authors hypothesize horizontal transport in the residual layer is the main reason for the ozone pollution in 25 Aug. I recommend the authors analyzing the horizontal contribution in the RL carefully using the process analysis.

Technical comments

1. I recommend changing summer smog to photochemical smog throughout the manuscript.
2. Please check all the subscript and superscript throughout the manuscript.
3. Please check all the abbreviation throughout the manuscript. All the abbreviation should be interpreted in abstract and main article separately. Generally, if the phrase

used more than three times, it can be defined by abbreviation. Otherwise, please use the full name of the phrase. For example, AGL has not been used more than three times.

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