

Interactive comment on “Wintertime aerosol chemistry and haze evolution in an extremely polluted city of North China Plain: significant contribution from coal and biomass combustions” by Haiyan Li et al.

Anonymous Referee #2

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General Comments

This manuscript discusses a wintertime field campaign in the North China Plain during an extreme haze period. The authors evaluate the sources of primary and secondary PM and discuss the evolution of PM constituents and gaseous pollutants in light of prevailing meteorological conditions. The paper is well-written and provides full documentation of the methods, calculations, analyses performed, and conclusions based on these analyses. Given the manuscript's focus on field measurements, the evolution of pollutants within air polluted air masses, and a geographic area that hasn't been the

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subject of many intensive field campaigns, this manuscript falls within the scope of ACP. I have no major comments on the manuscript, but present a set of minor comments in the "Specific Comments" and "Technical Corrections" sections below. I do note that for future manuscripts, the authors should ensure that every line is numbered, as reviewers of this manuscript had to count lines to ensure that the correct line numbers were cited.

Specific Comments

1. Line 44: "may cause climate change" is very vague. This should be expanded to a sentence discussing radiative forcings and the indirect and direct effects of PM.
2. Line 153: The CNAAQs is quite high compared to PM standards in other countries. It would be helpful to compare the CNAAQs here to international standards to give readers a broader picture of the percent of days that had high PM.
3. Line 155: Explain how "red haze alarms" are calculated.
4. Figure S9: This figure is a key piece of information related to your argument in lines 170-175. I suggest moving this figure from the supplement to the main document.
5. Line 173: I don't agree with your definition of "background." It would be more correct to simply state that ozone concentrations were nearly zero during haze episodes, as these episodes cannot be considered background time periods.
6. Line 194: Define the acronyms WS and WD here.
7. Line 195: It's not clear how figure S10 supports this argument, and this should be clarified.
8. Lines 216-218: The final sentence in this paragraph is an opinion, not a result, and therefore should be moved to the conclusions.
9. Line 385: What evidence do you have that fN increased? To me, it appears that the median fN at 90-100% is the same as at 20-40%.

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10. Lines 412-413: Clarify what is meant by "low efficient combustion."

Technical Corrections

1. Line 56: "combustions" should be "combustion"
2. Line 225: "the" should be inserted between "during" and "biomass"
3. Line 392: "For another" doesn't fit well here. I suggest changing this to "Another explanation is that"
4. Line 421: "northeastern" should be changed to "northwestern"

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2016-1058, 2017.