

***Interactive comment on* “Effects of turbulence structure and urbanization on the heavy haze pollution process” by Yan Ren et al.**

Anonymous Referee #2

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The authors investigated the influence of turbulence structure and urbanization on the heavy haze pollution process, and did a very detailed analysis. The results provide valuable information on the interaction between pollution and turbulence flux and the differences between urban and rural area during heavy haze time. However, further study according to following comments is needed:

Major comments:

1) the authors mentioned “the impact of the pollution process on suburb areas is much greater than that on urban areas. Urbanization seems to help reduce the consequences of pollution” in the end of abstract. What are the dynamic/physical mechanism behind that? What is the difference in PM_{2.5} source at urban areas and suburb areas?

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2) The heights of two observational sites are different, one at 25m and the other at 10m. What are differences of temperature, wind speed, specific humidity and PM_{2.5} caused by the height difference?

The authors used one point to represent the whole Beijing, how much is the difference in surface temperature, wind speed, specific humidity and PM_{2.5} at different locations of urban Beijing?

3) The authors pointed out the differences between clear and pollution days in the mass and energy exchanges at surface and concluded that the pollution inhibits the mass and energy exchange at surface. However, weak vertical mixing and surface wind can cause pollutants to accumulate and lead to heavy pollution.

Minor comments:

1) Figure 2a only has one line, but 2b and 2c have two lines. Figure 2a should have two lines to show the results from two stations.

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2018-881>, 2018.

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