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Interactive comment on “Modeling the feedback between aerosol and meteorological variables in the atmospheric boundary layer during a severe fog-haze event over the North China Plain” by Y. Gao et al.

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Received and published: 24 March 2015

We thank the reviewer for helpful and constructive comments.

China is experiencing the low visibility and serious air pollution in large regional scale during last few years. January 2103 was the worst month when the heavy air pollution episodes last almost whole month and covered the most of China. The MS investigated the episode happened in January 2013 and study the feedback of aerosol and meteorological variables. It gives a highlight to understand the pollution process and it

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represents a substantial contribution to scientific community. However there are a few questions needed to be revised.

1. "Fog-haze" was used in the title, it is important to define what is the fog-haze day.

Reply:

We thank the reviewer for this constructive comment.

The "severe fog-haze event" in the title refers to the period of 10~15 January when the aerosol concentration was very high and the atmospheric visibility was extremely low. Now we make it more clear in the manuscript:

We revise the sentence at Page 1094 Line 5 to "The numerical experiments are performed for the period 2–26 January 2013, during which a severe fog-haze event (10–15 January 2013) occurred with the simulated maximum hourly surface PM_{2.5} concentration of ~600 ug m⁻³, minimum atmospheric visibility of ~0.3 km and 10–100 hours of simulated hourly surface PM_{2.5} concentration above 300 ug m⁻³ over NCP."

We revise the sentence at Page 1096 Line 3~4 to "During 10–15 January 2013, extremely severe fog-haze occurred over the NCP, especially over Beijing, Tianjin, and south of Hebei Province with very high aerosol concentration and extremely low atmospheric visibility."

We also revise the sentence at Page 1106 Line 10 to "In this section, the aerosol radiative forcing (ARF) and its impacts on surface energy, temperature, RH, atmospheric stability, wind, and PBLH during the fog-haze period (10–15 January) with the simulated maximum surface PM_{2.5} concentration of ~600 ug m⁻³, minimum atmospheric visibility of ~0.3 km and 10–100 hours of simulated hourly surface PM_{2.5} concentration above 300 ug m⁻³ over NCP are presented."

2. Some figures are not clear, especially in Fig. 1 and Fig. 2.

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We thank the reviewer for this helpful comment.

As the terrain height is not mentioned in the manuscript, now we delete the distribution of terrain height in Fig. 1 to make Fig. 1 more clear. We also check Fig.2 and other figures to make them more clear.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 1093, 2015.

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