

Interactive comment on “Characteristics and formation mechanism of continuous extreme hazes in China: a case study in autumn of 2014 in the North China Plain” by Y. Yang et al.

Anonymous Referee #1

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This manuscript provides case study on the characteristics and formation mechanism of the extreme haze events in the North China Plain. The recent heavy haze pollution in China has drawn much attention, and the authors of this paper analyzed formation process of four haze events based on chemical measurements in one site of Beijing in October of 2014. Considering there have been many similar studies, it is necessary for the authors to clarify their novelty. Also, parts of the conclusions seem lack corresponding support. At least a major revision is needed before the consideration of publication. Some specific comments are as follows:

1 The title: how did the author define “extreme haze”? Compared with haze events in
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other seasons or the same periods in other years? Previous studies show that heavy pollution is common in October in northern China.

2 The content: the authors tried to explain the haze events with several key factors such as low PBL and high RH, which are common in previous studies such as Liu et al., 2013. What's new in this study? What's the predominant factor, and how about their respective quantitative contributions? It can be confusing if the authors listed various factors without their clear contributions, especially in the section 4.

3 Conclusions in several parts lack sufficient data support: 1) The authors said that biomass burning played an important contribution, but there was a decrease in the fraction of BC in haze events; and the biomass burning was usually concentrated in the first half of October; 2) If secondary transformation was considered important, the authors should put Figure 7 and Figure 2 together, and present their correlation; 3) In Figure 16, if radiation absorption was considered the direct reason of higher temperature, please give the data support. I think higher temperature was more relevant with the regional circulation. 4 This study was mainly based on ground measurements in one site of Beijing, can it explain the widespread haze pollution in northern China, where emission sources and chemical characteristics can be very different.

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