

Interactive comment on “Understanding Severe Winter Haze Pollution in the North-Central North China Plain in 2014” by Zhicong Yin et al.

Anonymous Referee #2

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In this work, the authors discussed the possible mechanisms of the severe haze pollution over the North China Plain in winter. Three teleconnection patterns (EA/WR, WP and EU) might have led to stable meteorological conditions that contributed to severe haze events over the North-Central North China Plain in 2014. Using SVD analysis, several external forcings were pointed out to have enhanced certain teleconnection patterns. This paper highlights the links between external forcings, teleconnection patterns and WHDs, but more discussions in detail were still needed in this paper:

1. 39 NCP stations were used to reconstruct the climatic WHDs, significant spatial variation of WHDs could be observed in Figure 4(a). Only four rural stations were selected to represent urban haze. The authors didn't introduce the locations of the four stations.

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2. During the period from 1979 to 2012, the negative SLP anomaly in the Siberia region and the positive SLP anomaly over West Pacific led to weakened EAWM inducing the southeasterly anomaly (Figure 5 (a) and (c)), which was favorable for haze events. But in 2014, anomalies of meteorological fields (Figure 5 (b) and (d)) for WHDs in the NCP region were different from those in 1979-2012. Although the surface temperature was higher than average over the Asian continent, the surface wind fields over NCP region didn't show favorable conditions for WHDs. As anthropogenic emissions could also influence air quality, meteorological conditions might not be the main cause of WHDs in 2014.

3. Two extreme haze phenomenon were discussed in this work. Teleconnection patterns in 2010 and 2014 were different, but over the NCP region, anomalous circulations of wind fields in 2010 were similar with those in 2014. And the authors didn't discuss the regional meteorological conditions over NCP region in detail in 2010. Thus, in order to prove the importance of meteorological conditions on these two haze events the authors need to provide more evidences to support their arguments.

4. The authors concluded that anomalous circulations in winter 2013 were not as favorable for haze conditions as those in 2014. But the number of WHDs in 2013 was as large as that in 2014. Does it mean that the influence of anthropogenic influence was more significant in 2013 than in 2014? How could the authors eliminate the influence of anthropogenic influence?

5. In Line 10: inappropriate adjective “highest”.

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