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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Attributions of meteorological and emission factors to the 2015 winter severe haze pollution episodes in Northern China" *by* Tingting Liu et al.

Anonymous Referee #2

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Review of Liu et al.

This manuscript presents a comprehensive analysis of the differences in meteorological conditions over North China between winter 2014 and 2015 and the impact of those differences on PM2.5 air quality. The analysis is solid and the presentation is clear and well-written. I recommend publication in ACP after the following comments are addressed.

Major comment:

1. More evidence or discussion is needed to support the authors' argument that the meteorological difference between winter 2014 and 2015 over North China is related

to the strong El Nino in 2015. The analysis presented in the manuscript is all confined to North China, so it's difficult to judge whether the meteorological difference is due to the intrinsic year to year variability on local and regional scale or indeed something related to ENSO. For example, the authors can discuss if prior El Nino winters have seen similar changes in the wind convergence zone over North China. In addition, previous analyses have analyzed the role of winter monsoon on wintertime PM pollution in North China (e.g. Jia et al., A new indicator on the impact of large-scale circulation on wintertime particulate matter pollution over China, ACP, 2015). The authors should give a more comprehensive summary of those prior studies that link region- and local-scale meteorology changes to larger-scale variability. In this context, this manuscript might be the first to investigate the role of El Nino on winter time PM pollution in China.

2. The manuscript focuses on North China, but only four cities are analyzed. Are these cities representative of the whole region? What is the specific domain of North China? Better to include a regional mean comparison between the two winters in the tables and discussion.

Minor comments:

1. Pg 2, line 12: change 'drop' to 'dropping'

2. Pg 3, line 5: change "as high" to "as high as"

3. Figure 1: missing symbols and legends

4. Pg 7, line 6: what are the emissions control measures implemented between the two years? How significantly are these measures expected to reduce emissions? It will be helpful to describe them in the context of changing pollution levels between the two years.

5. Pg 7, line 14: change "gathering" to "accumulation"

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