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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Understanding the Recent Trend of Haze Pollution in Eastern China: Roles of Climate Change" *by* H. J. Wang and H. P. Chen

Anonymous Referee #2

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The impact of climate change on air quality is an important cross-disciplinary topic. Previous studies were mainly conducted by using numerical models and there is limited number of studies based on analysis of observational data, especially in China. This study presented a very interested analysis on the trend of number of haze days and investigated the influences from Artic sea ice extent, precipitation and surface wind speed for different decades based on measurements at 756 ground station during 1960-2012. This paper is generally well-written and provides a different but unique angle of view from climatologist on the trend of air pollution in eastern China. I would like to recommend its publication in Atmospheric Chemistry and Physics after the following minor/technical points addressed appropriately.

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Discussion paper

Main comments:

1)If I understand it correctly, the “haze day data” (i.e. the term defined as “monthly haze day data” at L1, Page 4.) used in the trend analysis is the “total number of haze day in a month”. In the text, this term is not very clear defined. It will be better to give some details of the data in Sect. 2 and clarified this term because it is not widely used in countries other than China. Also, it will be better to include some previous works e.g. Chen et al., 2015, which used the same dataset, as a reference in this section.

2)The discussions in the last paragraph of Sect. 3 (L3-L19, Page 7): The authors tried to discuss the reasons of the contradict trends between haze pollution and emission control. One point worthwhile to be mentioned here is that the trend of haze pollution based on “haze day data” actually is the trend of frequency (of haze day) but not the averaged pollution concentrations. The former might link more with the change in occurrence frequency of extremely stagnant weather, which was influenced by natural climate variability (Zhang et al., 2016), but the latter will be more related to the emission and control measures. Here a comparison with the two variables should consider the differences, at least mention the possible influence. In additional, this part probably can be moved into the Section 4 as the last discussion point highlighted for policy makers.

Reference: Zhang, Y. et al., Impact of synoptic weather patterns and inter-decadal climate variability on air quality in the North China Plain during 1980-2013, Atmos. Environ.,124, 119-128, 2016.

Minor comments:

1)Line 21-22, page 2: “particulate matter 2.5”, Please change it to “fine particulate matter (PM2.5)” or “particulate matter with mean aerodynanmic diameter less than 2.5 micrometers”.

2)Line 20-21, Page 3: “a recent study further reveals that”, should you have a reference here? For example, “a recent study by Wang (2015) further revealed that”.

3)Figure 6: What does “Jiangnan(JN)” in the figure notes mean? Maybe change it to “South China”.

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