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Interactive comment on "Severe winter haze days in the Beijing-Tianjin-Hebei region from 1985–2017 and the roles of anthropogenic emissions and meteorological parameters" *by* Ruijun Dang and Hong Liao

Anonymous Referee #1

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This paper investigates the roles of meteorology and emission on the long term changes of winter haze in the BTH region. To my knowledge, this is the first attempt to quantify these two effects for historical periods. The results shown here thus have important implications for the understanding of haze formation and air quality control in north China. The paper is also well organized and easy to follow. I only have a few minor comments as listed below:

1. It is better to include some more quantitative results in the abstract, such as those in Table 1 and Figure 12. 2. Section 2.2: Historical visibility data usually have higher

uncertainty and noise level, I wonder if any quality control is enforced? 3. Section 2.3.1: The authors perform nested simulation with high resolution. However, the input meteorology data is still of low resolution. I wonder if this will affect the simulation results? Or is nested simulation really necessary? 4. Section 4.2: I suggest adding some discussion about the uncertainty of the trend of each species, as this can be significantly affected by uncertainties in emission (especially historical emission data) and chemistry processes in the model. 5. Section 5: When using equation (1) to make the partition, the contribution of each factor is assumed to be linear. This may not always be true. For example, both transport and PBL mixing can be affected by horizontal wind speed. So maybe a note is needed here when interpreting the results? 6. Figure 9 is very interesting and important. I wonder if the results are similar for different periods with different haze day trends?