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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Two pathways of how SST anomalies drive the interannual variability of autumnal haze days in the Beijing–Tianjin–Hebei region, China" *by* Jing Wang et al.

Anonymous Referee #2

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This paper provides a new possible signal source in the North Atlantic subtropical sector (R1) and the western North Pacific sector (R2) for autumnal haze days (AHD) in the Beijing-Tianjin-Hebei region (BTH region) via the tele-connection mode. The effect sequence of the warm phase of these two oceanic sources on the AHD in BTH is basically reasonable, leading to depressed planetary boundary layer and subsidence of the atmosphere. These changing meteorological conditions are the favorable background for the higher AHD in BTH. The methodology used in this paper is correct (i.e. Rossby wave train). The findings obtained by this paper may be useful to make the seasonal outlook of the air pollution condition in autumn. The specified corrections: (1) For the SST of the North Atlantic, why only the middle oceanic region is selected? The

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Discussion paper

representative signal source of the AMO should be the triple-pole SST pattern, with high-latitude and the tropical poles being more important. (2) From Figure 2, one see the rapid increase of AHD in BTH. However, other studies have shown that the rapid increase in AHD started from the mid-ninety of 20 century or early in this century. Please compare the difference between them and explain why. (3) For Figure 6, please indicate the significance level for the correlation coefficient. (4) The anticyclonic circulation over Northeast China-Okhotsk Sea at 850 hPa is a critical system. Please check if it only takes place in autumn (or/and winter)? Whether or not it already exist in summer? (5) From Figure 10(a), the descending motion seems to be out of BTH region. Please explain it. (6) The warm R2 should be associated with the El Nino event. Therefore, according the EAP pattern, it could be “- + -“ meridional circulation pattern. Please attention to this point and further properly modify the position A in Figure 13.

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