

Interactive comment on “Impact of Western Pacific Subtropical High on Ozone Pollution over Eastern China” by Zhongjing Jiang et al.

Anonymous Referee #2

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Review of “Impact of western pacific subtropical high on ozone pollution over eastern china”

This study presents a combined modelling and observational investigation of how meteorological conditions associated with the western pacific subtropical high (WPSH) affect surface ozone. The manuscript tells a nice story, with each piece of analysis following on from the previous. Their approach does represent a broader (temporally and spatially) and more coherent analysis than previous studies, particularly Zhao and Wang (2017).

The manuscript is well written and leads the reader through the analysis in a very clear manner, particularly the introduction. Observational analysis is backed up convincingly by a modelling study which seeks to determine the effect of natural emissions on ozone

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variability. This modelling study further demonstrates the importance of physical and chemical mechanisms during different phases of the WPSH.

Main comments:

1) My main comment is about what this manuscript presents that isn't already published. To me it seems as if the manuscript's novelty is in the modelling, and improved understanding about the processes that alter the ozone budget under the WPSH regimes. However, in the conclusion and abstract much of the text is dedicated to drawing conclusions about ozone changes driven by meteorology, which is very similar to the work of Zhao and Wang (2017). I do note that the authors do point out that their study considers an observational record two years longer than Zhao and Wang. The paper provides useful insights from the modelling approaches, though my opinion is that these insights should be the focus of the paper.

2) The use of north and south China does not seem consistent throughout the manuscript. At L205 north/south is demarcated at 32N. Later, at L333, north and south regions are defined 36-42N and 26-32N respectively. Some clarity would be beneficial. The choice of the north and south region (L333) seems somewhat arbitrary and needs more rationale, as many conclusions in section 3.4 rest on this choice, particularly those surrounding the contributions of BVOCs, soilNO_x etc in figures 6(i-n).

Minor comments:

-L137 Is this definition of weak, normal, strong conditions common? If not, more rationale about these percentile choices is warranted.

-L229-233 This paragraph and the accompanying graphs really clearly and nicely demonstrate the meteorological effects. However, I don't agree that figure 3c shows a decrease in precipitation over northern china, at least not significantly. Figure 3c shows very little change to me.

-L283 Are the modelled strong/normal/weak values calculated from the same days as

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the observations? A direct comparison as seen in Figure 2 would require this, but it is not clear to me that this is the case.

-Figure 1c requires an axis label dependent on your normalisation procedure. It is not apparent what form of normalisation has been performed

-Other figures. The quality of the figures is excellent, if a little small.

Technical corrections:

-L72 'some led' -> 'some that led'

-L103 should 'since' -> 'in'?

-L110 Should 'following' -> 'preceding'?

-L114 was -> were

-L235 'temperatures, less' -> 'temperatures and less'

-L429 'much' -> 'more'?

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