

## ***Interactive comment on “Regional responses of surface ozone in Europe to the location of high-latitude blocks and subtropical ridges” by Carlos Ordóñez et al.***

### **Anonymous Referee #1**

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Ordóñez et al. present a comprehensive analysis of the influence of the location of high-latitude blocks and subtropical ridges on European near surface ozone concentrations. The catalogue for blocks/ridges based on geopotential height at 500 hPa from the NCEP/NCAR reanalysis and a novel gridded dataset for maximum daily 8-hr average ozone utilized by the authors have been well-documented in the recent literature. The manuscript is clearly structured, well prepared and provides interesting insights in European surface ozone variability. I recommend publication in ACP after some minor clarifications/changes described below.

Specific comments:

1) The authors are using the NCEP/NCAR reanalysis at  $2.5^\circ \times 2.5^\circ$  horizontal resolu-

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tion to detect high-latitude blocks and subtropical ridges. In Sect. 2.2 we learn that the same catalogue as in Sousa et al. (2016a,b) is used. I wonder if the frequency of blocks and/or ridges identified would significantly differ if another reanalysis (ERA-Interim or MERRA) at higher horizontal resolution would be used?

2) Do the grey bars in Figure 5 really show the seasonal climatology (all data) or do they show surface MDA8-O3 during times when no block/ridge is present in the domain? If all data is shown I suggest adding a PDF curve also for the no block/ridge case.

3) Sections 3 and 4 provide a very comprehensive overview about the effects of blocks and ridges on seasonal MDA8-O3. To allow easier comparison among individual cases I suggest combining Figures 7 and 13 in one 4-panel illustration.

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