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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Attributing trends in extremely hot days to changes in atmospheric dynamics" *by* J. A. García-Valero et al.

Anonymous Referee #2

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– General comments

This manuscript provides yet another analysis of weather extremes and their relations to atmospheric circulation over the Iberian Peninsula. Even though the topic is important and worth studying, I have doubts about the scientific quality and formal aspects of the paper. I don't think the topic is original - a similar analysis, only using station temperature series instead of gridded data, was performed by Fernandez-Montes et al. (Atmospheric Research, 127, 154–177, 2013).

– Specific comments

1. The methodology is so complex that it is hard to follow the message. I am not convinced that the methodology is correct. It seems problematic to study extreme events

in data that were smoothed twice: first by interpolating station temperature data into a grid, second by averaging data from gridpoints in each of the 8 regions. I suppose that the statistical distributions (PDFs) of the daily data are severely distorted, especially in their tails, i.e. extremes. Indeed, the effects of extremely high temperatures are always local and should be studied at a local scale, be it adverse health effects or environmental effects such as drought or wildfires.

2. The classification of circulation types in all days when extremely high temperatures occurred anywhere within Spain is again problematic. It would make more sense to perform the classification separately for each of the regions.

3. The method used to allocate all days without extremely high temperature to circulation types that occur in days with extremely high temperature is either incorrect or improperly described (section 5.1, table 6). I did not understand the selection of thresholds of correlation and distance. How could two fields of an atmospheric variable that are negatively correlated still be considered similar?

4. The Conclusions and Discussions section is barely understandable without reading the rest of the article. As I am not convinced that the used methodology is correct, I am simply not able to identify with the presented conclusions.

– Technical corrections

1. The level of English should be improved. Common mistakes include incorrect word order, improper use of words, misspellings, mistaken concord. Some sentences do not make sense. This hampers the overall readability of the manuscript.

2. Please clarify the number of extremely hot days – is it 863 (p. 3331, l. 4) or 784 (p. 3333, l. 6)?

3. In Table 2 it is not obvious what do the non-diagonal percentages mean, specifically, to which region the percentage pertains. Example: NE and SW regions share 37% of extremely hot days, but does this mean that 37% of EHDs from the NE region are also

hot days in the SW region, or vice versa?

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