

Interactive comment on “Revisiting the trend in the occurrences of the “warm Arctic-cold Eurasian continent” temperature pattern” by Lejiang Yu et al.

Anonymous Referee #1

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The linkage between the warm Arctic and mid-latitude weather and climate is a hot topic for cryosphere research community and for this reason, I see this study is interesting and worth to be noticed as a scientific publication. The manuscript is well structured, and the objectives of this study are clear. The content fits well the scope of ACP. I recommend this manuscript to be published in ACP. However, I see there are some aspects scientifically and technically that still need further improvement for better clarity of this manuscript, I hope authors can make corresponding revisions based on my comments below:

1 Title: “Revisiting the trend in the occurrences of the “warm Arctic-cold Eurasian con-

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continent” temperature pattern” Why “revisit”? Have you (authors) done this before? or are there other papers dealing with this matter before? if so, what are the scientific outcome from those existing studies?

2 To my understanding, SOM is a pure advanced statistical tool and there is nothing related to the physics, right? If this is the case, shall I say any results come from SOM have uncertainties because you need to pre-define SOM nodes and this procedure is a kind arbitrary, right? On top of it, as you pointed out in the abstract only 40% of the surface temperature trends are explained by SOM pre-defined nodes that fit to your pre-condition, i.e. warm Arctic-cold Eurasian continent. What I am trying to say is that for what kind of criteria you need to be satisfied before you can make a rebut conclusion to say: “ok, there is a linkage” or “no, there isn’t a linkage”. This comment and “a kind of arbitrary” above come from your description on line 141-143.

3 How sensitivity of the data source will impact the final result? In this study, you have applied ERA-Interim data. if you use other data resource, e.g. NCEP or MERRA, would be your conclusion changed entirely or partly? I am not asking to use these data sets to rerun SOM, but it would be nice to comment it at the end of this study.

4 Authors focused on the impacts of the SST anomalies over North Pacific and Atlantic Oceans on the trend in the occurrences of the “warm Arctic cold Eurasian continent” temperature pattern. The influence of decreasing Arctic sea ice cannot be ignored. You may consider to add discussions on the influence of sea ice to your pre-defined warm Arctic and cold Eurasian content.

There are a number of technical details need to be clarified:

a) Fig.1: All “percent” sum together is larger than 100%, please check. b) Fig.2: The color bar refers to what? Contour color? what are the background (fingerprint like) information in each sub-plot? The text explanation for figure 2 (line 182 -185) and figure 2 presentation seems not match to each other. I suggest you remove unnecessary from the plot and only show what you have explained in the text so readers can

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understand better. c) The comment above applied to at least Fig, 3, 4, 5 and 6. d) “same as Figure2, but for,,” This is not a good figure caption, please write clear with full information. For those surface fluxes, I think you need to explain the unit of the fluxes, are those daily accumulated fluxes? e) The sea ice concentration figure needs more explanations, e.g. node information was missing; what was meant for positive and negative anomalous? is this also for winter season? how about summer season? Now I realized you actually only investigate winter season for everything, if so, you need to say this explicitly in the beginning of the paper,, f) Fig.7 and 14: I have difficult to understand these figures? What we can learn from those figures? If you only tell the integrated total number of days for each node and compared with showing this figure, what we will missing up? g) Fig. 12: “wave activity flux”: This need to be explained more in detail both here and in the text. 100m2/s, what is this? and in the caption: 107 m2/s,, h) Please mark the study area in corresponding figures 2-6, to help readers understand the mechanism impact more intuitively. i) Table 3 is not mentioned in the article, and some problems of uppercase and lowercase letters (such as not show or Not show), please check them carefully. j) The order of the nodes should be consistent in figures, 10-12. k) Authors should increase some discussions about the application of statistical results in prediction of surface temperature Arctic cold Eurasian continent.

The results in this study are based on statistical analysis. Some numerical experiments may be considered in the further studies.

I hope authors will find my comments useful to make further improvement of this manuscript. The manuscript may need to be reviewed again before it can be accepted for publication in ACP.

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