

Weather Clim. Dynam. Discuss., referee comment RC1  
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## **Comment on wcd-2022-23**

Anonymous Referee #1

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Referee comment on "Signatures of Eurasian heat waves in global Rossby wave spectra"  
by Iana Strigunova et al., Weather Clim. Dynam. Discuss.,  
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### **Summary of the article**

This manuscript isolates heat waves events, defined as episodes which spatially averaged surface temperature in Eurasia are above 95% percentile on at least 3 consecutive days, and compare their spatial spectra of energy anomalies of various ranges of wavenumbers with the climatology. This work finds that during heat waves, the skewness of planetary waves grows while that of the zonal mean flow goes in opposite directions, which is consistent with previous findings.

### **General comments**

I am concerned about the fact that the analyses done in this work all confirm previous findings but provide no additional insights to how we understand heat waves/blocking. It has been well-known that heat waves are associated with blocking since blocking, by definition, refers to the phenomena in which (1) the eastward zonal wind is disrupted (increase in wave amplitude essentially implies weakened zonal wind, as implied by non-acceleration theorem) (2) the high pressure cell remains stagnant for a few days, (Therefore, reversal of zonal wind and geopotential height anomalies have been used to define/detect blocking.) which, this manuscript essentially shows.

There have been many studies showing blocking being the culprit of heat waves in the eurasia region as confirmed by the analyses here. Therefore, in order to be accepted for publication, the authors should have shown what extra insights about heat waves can we obtain from these analyses, which I think the current version of manuscript is lacking.

### **Specific comments**

There is one sentence in the manuscript that I find confusing in Section 3.2: "Under the global variability spectrum, we imply the PDFs of the global energy anomalies and under signatures of heat waves, we imply significant changes in the distribution of energy anomalies." If the authors have new findings and plan to greatly revise and resubmit the manuscript, please rewrite this sentence with clarity.