

Weather Clim. Dynam. Discuss., referee comment RC2  
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## Comment on wcd-2022-23

Anonymous Referee #2

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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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The authors have applied three-dimensional normal mode decomposition to wind and geopotential fields to investigate structural differences of European heat waves in modal space relative to climatology. They find the skewness of PDFs of planetary-scale circulation is increased by a factor of two, and variance decreases for planetary scales and increases for synoptic scales during the heat waves. Overall, I find this study can provide a unique perspective of heat wave characteristics in modal space, but they may need to put more efforts into interpreting and presenting the results. Below I list several concerns:

- Please address the significance of the difference in Figs.6,8. Because there are limited samples for the heat waves, is it possible that the difference is caused by sampling?
- Based on the presented results, one may also get the impression that heat waves are structurally similar to climatology, except that the amplitude is higher. Should we emphasize the similarity or the difference?
- Why are the amplitudes of the two PDFs so similar in Fig.6, while the total number of heatwaves is much smaller than the number of cases used to calculate climatology? I am not sure whether I understand how they defined climatology.
- What's the reason to normalize energy anomalies? Does it impact the major results?