Weather Clim. Dynam. Discuss., referee comment RC1
https://doi.org/10.5194/wcd-2021-7-RC1, 2021

Comment on wcd-2021-7

Anonymous Referee #1

Referee comment on "Large-scale drivers of the mistral wind: link to Rossby wave life cycles and seasonal variability" by Yonatan Givon et al., Weather Clim. Dynam. Discuss., https://doi.org/10.5194/wcd-2021-7-RC1, 2021

The authors investigate the different expressions of isentropic PV that govern the occurrence and role of the mistral wind using a SOM clustering approach, which reveals new aspects of the upper-level circulation impact on low level features.

The paper is beautifully written and concise, with a thorough discussion of the findings and it should be accepted for publication in Weather and Climate Dynamics. Though there are some points that in my opinion need to be clarified, mostly regarding methodological choices. I hope the authors find the following comments useful.

specific comments

- In the title, why “synoptic” and not “large-scale” drivers is chosen?
- I don’t quite understand why for the identification of the mistral days the cyclone masks are firstly applied and you did not apply the wind criterion alone. Could you please elaborate on that? Additionally, did you test the sensitivity of the results on different wind speed thresholds? (lines 118-123)
- Commonly normalization refers to the use of min value and of max-min range to bring the values between 0 and 1. I would say that the choice here is more of a rescaling. Most importantly, is this step necessary for the SOM application? If not, why this modification was applied? (lines 52-56)
- The set-up and validation of SOM method are extensively discussed, though I would like to ask if the frequently used quantization and the topographical errors were examined as well.
- I would suggest to add the resulted PV maps for the 16 clusters along with the STD maps in the Appendix A2 in order to facilitate the reader to follow the discussion, otherwise one should go back and forth between Figure 3 and A2. In any case, I think that the resulted PV maps is necessary to be provided per se.

minor comments

- In line 23, I am not sure that “filament” is the appropriate term here
- In lines 42-43, please define “altitude-crossing mechanism”
- In Figure 3, the colorbar for the PV units is missing