Second round of review of
"Physical Processes Leading to Extreme day-to-day Temperatures Changes, Part 1: Present-day Climate"
by Kalpana Hamal and Stephan Pfahl
submitted to Weather and Climate Dynamics

General comment:
This is the second time I am reviewing the manuscript, and I believe it has substantially improved during the first round of review. In particular, I appreciate that the authors are now more precise in their use of terminology (e.g., "advection," warming/cooling events), which significantly enhances the clarity of the text.

However, in response to some of my previous comments (regarding lines 159-161, twice line 214, Caption Figure 4 in the original manuscript), the authors stated that they had incorporated the suggested changes into the revised manuscript. Unfortunately, these changes do not appear in the current version. I assume this was an oversight, and I would like to encourage the authors to implement these revisions in the next version.

I still have a few minor suggestions for improving the text, but overall, I feel the manuscript is close to being ready for publication.

Minor comments:

L61: The sentence "In contrast, tropical regions typically exhibit weaker temperature advection" suggests a comparison, but earlier in the text, you have not explicitly mentioned that other regions exhibit stronger temperature advection. Consider rephrasing to make the comparison clearer and more logically connected.

L61: I feel that the use of "However" at this point may not be appropriate.

L112: "The approximation in equation (4) is based on ..." instead of "… is associated with"?

L124: I suggest removing the word "previous" from the phrase "previous studies on extreme temperatures" as it may imply that your study also focuses on extreme temperatures, which it does not.

L125: It is not clear to me why the near-surface layer must be assumed to be well-mixed. Could you clarify this point?

L127-129: Think about just omitting the fact that you actually computed 10 day trajectories, although in the end you only needed 3 day trajectories.

L136: Where does the "these" refer to?

L137: I would try to be consistent with the heading of this subsection, so I suggest instead of "Lagrangian temperature variation decomposition" "Lagrangian temperature variability decomposition".

L186: "… while in the tropics, σ DTDT is lower associated with lower σ T , despite lower r 1,T ." I have difficulties to understand this sentence. Think about reprhasing.

L541-544: “… but advection plays a smaller role, in particular for temperature extremes and heat waves in larger parts of the mid-latitudes”. I appreciate that you tried to add a more nuanced discussion here. However, I still feel that it is not correct what is stated here, since the literature is not clear about whether advection really plays a smaller role for warm extremes than for cold extremes. Maybe just apply a more cautios formulation, e.g. “… where advection is sometimes thought to play a smaller role, in particular for temperature extremes and heat waves in larger parts of the mid-latitudes”?

L576: Where does the “this” refer to?

Technical corrections:

L147: cross the “was”?