Public response to Reviewer 3 egusphere-2024-3404

The authors thank Reviewer 3 for the constructive comments and suggestions. Please, see our responses below.

Response to Reviewer 3

Reviewer 3

Reviewer Comment 3.1 — The authors have addressed some of the concerns about the naming of their method and have edited the manuscript to make it clearer that this is not necessarily a better method that previous clustering methods, but rather an identification of a somewhat different thing.

However, in arguing why the paper should not use the term "cyclone families" in their description of the spatio-temporal clustering, it has introduced a bit of confusion. The authors argue that the clustering algorithm does NOT identify the cyclone families of Bjerknes and Solberg due to them following the same track rather than necessarily developing on the same polar front. However, they still name one of their clustering types as Bjerknes type. Plus, much of the study is motivated by this idea of cyclone families.

My recommendation is that this confusion is cleared up in the abstract, the introduction, and the conclusions with somewhat different motivation, and that the Bjerknes type is renamed to something that does not confuse this point.

Reply: We thank the reviewer for their time and positive feedback. We are glad to read that our revisions improved the manuscript and that we were able to address most of the concerns. Regarding the remaining concern about the nomenclature, we agree that this could have been clarified further and we thus attempted to do so in the indicated sections. While we do not specifically detect cyclone clusters demanding that these cyclones formed on the same front, our detection algorithm, however, most likely includes these type of cyclone clusters. Hence, it is probably not correct to state that our detection algorithm does "NOT" detect cyclone families according to Bjerknes and Solberg, but that we not explicitly sub-categorise our detections into such a class.

We agree that the naming of Bjerknes-type creates some ambiguity and we have now re-named these clusters to "sequential" type cyclone clusters. We hope that the final textual changes and the renaming alleviate the remaining concerns of the reviewer.