

## ***Interactive comment on “TempestExtremes v1.0: A Framework for Scale-Insensitive Pointwise Feature Tracking on Unstructured Grids” by Paul A. Ullrich and Colin M. Zarzycki***

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### **Reviewer #1.**

This is an excellent manuscript, very well written, in an important topic with many applications. I recommend the publication of the manuscript with minor revisions. My main suggestion is that the authors should expand the explanations of their method, as detailed below. The issue of tracking features in models is an important one, and has important issues. It has many implications, as it hinders model intercomparisons,

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as well could have important implications in model projections. Therefore, having an open code that can be used in different models, with different resolutions and for multiple features is extremely attractive. I like the solution of using a great-circle-distance for dealing with models with different resolutions. It would be good for the authors to expand on this topic a little bit, maybe showing an idealized example of with plots of the great-circle distance in models of two different resolutions, to make the solution clearer for the reader. Similarly, a short paragraph describing the  $k$ -d tree in more detail it would be important for readers that are not familiar with the algorithm. Each of the sub-sections 2.1-2.8, could benefit with an expanded explanation on how the algorithm of works.

We agree with the reviewer and have added a few additional comments to each of section 2.1-2.8, including a new figure explaining differences between great-circle distance and latitude-longitude distance and a new figure explaining how the  $k$ -d tree data structure functions.

It is not clear from the manuscript if simple examples for each case (TCs, extra-tropical cyclones, easterly waves) will be available together with the software, so that one can learn to use the software. I would strongly suggest that this would be the case, having full examples, including input files, and examples of output files for the user to reproduce, is fundamental for others to learn to use the software

We also agree with the reviewer on this point and have added three selected examples to the TempestExtremes software package for TCs, ETCs and easterly waves. These can be downloaded from [http://climate.ucdavis.edu/tempestextremes\\_cfsr\\_tests.tar.gz](http://climate.ucdavis.edu/tempestextremes_cfsr_tests.tar.gz).

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