

## ***Interactive comment on “A global climatological perspective on the importance of Rossby wave breaking and intense moisture transport for extreme precipitation events” by Andries Jan de Vries***

**Anonymous Referee #2**

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General comments:

A global systematic analysis of the main processes contributing to EPE genesis is presented. In particular, the occurrence of two main drivers (in tandem and isolation) is considered for the first time on a global scale; Rossby wave breaking and IVT. To this end, this represents a very original contribution to the understanding of EPE generation.

The analysis builds on detailed and careful analysis of the data, on a large number

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of variables. I find figures excellent and well-illustrating results. However, the text sometimes is a bit too dense and difficult to follow due to overuse of bullet (numbered) lists, which breaks the flow of the text.

My suggestion, for example, is to reduce the abstract which I found far too long and detailed in the description of the results. See the attached pdf for detailed comments also on the abstract.

Major comments:

Seasonality is not explicitly considered in this analysis. I wonder how the repartition of these five categories in the space could change in the seasons.

Lines 323-325: The definition of IVT<sub>pct</sub> is not totally clear: Do you subtract to the full IVT the 95<sup>o</sup> percentile of the annual distribution at each grid point ? If yes, state this.

Lines 585-594: The difference between subtropical and extratropical circulation around EPE it is not very clear. Perhaps commenting more on the anomaly panels, one could see better the difference in baroclinicity with a more pronounced back-tilted cyclones in the extratropics.

Lines 710-713: I found weird the explanation of white areas in Fig.12 . It is stated that these areas coincides with those where cyclones and warm-conveyor belts have the highest relevance. Correct. But the same areas should also display substantial IVT values, like over the western Atlantic. If you have cyclones and WCB, usually there are also high IVT values (at least), in addition to upper level waves. I wonder if this lack of classification in this region it is not due to the definition of IVT<sub>pct</sub> objects which set to a too high treshold for this region in which very frequently IVT is very high. This is not clear to me and it deserves a clarification.

In addition to these few major points I have noted few technical corrections on the annotated pdf attached below.

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Please also note the supplement to this comment:

<https://wcd.copernicus.org/preprints/wcd-2020-44/wcd-2020-44-RC2-supplement.pdf>

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Interactive comment on Weather Clim. Dynam. Discuss., <https://doi.org/10.5194/wcd-2020-44>, 2020.