

## ***Interactive comment on “A global historical data set of tropical cyclone exposure (TCE-DAT)” by Tobias Geiger et al.***

### **Anonymous Referee #2**

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This manuscript describes a new public-available dataset of TC exposure. The exposure is defined as the number of the people and the sum of the property assets that potentially affected by a TC. The hazard discussed here is the wind. This manuscript demonstrates a new approach of producing a globally consistent exposure records using limited data with reasonable assumptions. For example, they assume the structure of the mean radial profile of surface wind with best-track data and generate 2-dimensional surface wind map for global TCs; they approximate the property assets with GDP. Furthermore, this dataset provides a valuable additional resource to the community studying TC related impacts, in particular for non-experts in this field, as pointed out by the authors in the Conclusion. I have only a few minor comments:

1. TC surface wind has wide variability. For practical purpose, one often approxi-

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mates the surface wind as a mean radial profile, plus an additional left-to-right motion-induced asymmetry, like Holland08. The limitation of such approximates on describing the full range of surface wind variable (i.e., the asymmetrical wind) is discussed in the manuscript. Additionally, it is worth to note that a recent study (Uhlhorn 2013) using aircraft observations found that the magnitudes of the motion-induced asymmetries at the surface do not necessary increase proportionally with the translation speed, as what is assumed conventionally (and in the manuscript). Another comment is that the wind damage primary from wind gust. Holland08, and other existing parametric wind models, despite being practical, are not able to accurate depict the probability of the wind gust.

I understand that Holland08 is a somewhat standard model, but as a reader, I would still suggest to show its equations here.

Uhlhorn, E. W., B. W. Klotz, T. Vukicevic, P. D. Reasor, and R. F. Rogers, 2013: Observed hurricane wind speed asymmetries and relationships to motion and environmental shear. *Mon. Wea. Rev.*, 142, 1290–1311.

2. L25 at Page 6: You mentioned that there is an underreporting in IBTrACs for earlier period. I agree, but this is usually for non-landfall TCs. Storms that made landfall should be reported even without satellite measurement.

3. L20, page 9: I will make it clear that the differences in the exposure measures is due to the differences in the wind estimates from Holland08 and HURDAText. The spatial (geographic) and temporal distributions of population and the GDP are unchanged here. In other words, you are not evaluating the exposure measures, but their sensitivity to the surface wind estimates.

4. Data: The current data is the exposure per storm per country, which is great. However, I think gridded data will further extend the utility of this global-consistent TC exposure dataset. Especially, the current spread sheet is calculated from gridded data (this is how I understood). The data will be large, though.

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Another comment on the data is that the authors should also provide GDP and population estimations as well. The current data contains only probabilities of the wind and the final exposure measures. As I mentioned in my general comments, I appreciate this study not only the final product, but also the approach. Release the GDP and population data will enable non-expert (non-economist) to create another globally consistent exposure measure with different parametric wind models.

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