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Interactive comment on "Tropical cyclone genesis across palaeoclimates" *by* J. H. Koh and C. M. Brierley

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It isn't clear to me what the best approach for the normalizing coefficient in GPI is. One could leave it out entirely (which is equivalent to using a uniform value for every member of the ensemble, as was done here). This has historically been the case—it was defined in Emanuel et al. (2008) without one—and we included a single value for the entire ensemble. So it is entirely defensible to do this, and it has the advantage of being comparable to earlier work published in this way. (To my knowledge, all of the papers employing this particular formulation take this approach.)

We introduced the normalizing coefficient in our definition of GPI in the Korty et al. (2012) papers partly because this formulation of GPI has units (in each grid cell) of storms per unit area per month; thus, integrating it over the area of the oceans and

in time had the attractive benefit of making the index a measure of count that could be more easily compared (and had numbers that were comprehensible to a reader). I see now, however, a disadvantage in the normalizing coefficient: these aren't actually counts of any real events. I suppose that either approach of using a single value across the ensemble or tailoring it individually to members could be defended, and that it would depend on which suited the purposes better.

The column in Table 2 prompted my suggestion to normalize it separately here, because, coupled with the language about cyclone frequency and genesis, I had thought on a first look through this paper that it reported some count of actual events in each model. After reading the paper more carefully, I realized this was not the case, though it was a point of confusion for me. I suggested this as a way that future readers may avoid this same kind of confusion, though there are other ways one could accomplish that.

I think the authors are well within their rights to define it either way, so long as the meaning of number of events per annum is made clear. Calling the column "Implied number of storms per year" might accomplish this without the need to redo the calculations. And it would preserve continuity with earlier publications, if such comparisons would be desirable.

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