

## **Comments from the Editor**

- Page 18, line 4 replace “Conclusions and discussions” with “Discussion and conclusions”
- I still consider the conclusions of your study not clearly written in the final section (see below)

In my view the three paragraphs of the “Conclusions” could be reconsidered as the following:

- First paragraph:

I suggest the following rephrasing:

*Estimates of the return significant wave heights within the stable threshold range may be relatively different, depending on the adopted threshold criterion, especially for a short return period. In general, the threshold selection criterion of Shao et al. (2018a) can be used to assess the extreme significant wave height. For example, at location #12, the resulting return significant wave heights for the return periods of 50-year, 100-year, 150-year and 200-year are 9.59 m, 9.86 m, 9.99 m and 10.06 m, respectively. However, under the criterion of Liang et al. (2019), the corresponding return significant wave heights are 9.69 m, 9.89 m, 9.96 m and 10.05 m, respectively. Benefiting from a diagnostic process of Liang et al. (2019), in our study we obtain return significant wave heights that are more stable than those of Shao et al. (2018a). Note that in table 9 of Shao et al. (2019) and tables 1 and 2 in this study, the return significant wave heights for the return periods of 50-year, 100-year, 150-year and 200-year are very similar at the same 22 study locations. Both groups of return significant wave heights are reasonable in the SCS. However, the threshold selection criterion in this study is suitable only in a tropical cyclone-dominated area.*

Two questions of mine about this paragraph:

- a) if yours and Shao et al. (2019) results are similar, what is the relevance of your method? Please explain
- b) Which feature of your method makes it suitable only in a tropical cyclone-dominated area? Please explain

- Second paragraph

I suggest the following rephrasing of the first two sentences:

*The analysis of the initial database and the characteristics of the tropical cyclones determine a bimodal shape of the maximal SWH distribution. The threshold to be used in the POT method can be identified, without a subjective definition, as the value separating the two lobes of the maximum SWH distribution.*

**The remaining three sentences (lines here below) are not clear to me. A rephrasing is needed. To which part of the articles do they refer?**

*A fixed distance is used to identify the initial database at the study site. This fixed distance allows some small samples (the corresponding track is far, or the intensity is weak) to be extracted. Thus, other analyses are needed to identify the extreme sample from the sample.*

- My understanding is the first three lines of this second paragraph describe your main conclusions. However, you may consider adding a new paragraph with short and clear description of 1) your main methodological conclusion and 2) the thresholds selection criterion

- Final Paragraph

*Consequently, the results of this study present a concept linking the assessment of extreme significant wave heights with the characteristics of tropical cyclones in a tropical cyclone-dominated area. The sample at the targeted location is affected by the track and intensity of the tropical cyclone. Future studies are suggested to promote the assessment of extreme significant wave heights in a tropical cyclone. For example, the threshold may be determined directly through a combination of track threshold and intensity threshold.*

**Comment: This paragraph is rather obscure. The final sentence (which concludes the article) suggests that the criterion proposed in this study will be likely revised in future and weakens the relevance of your work**

- The abstracts should include a clear description of the proposed criterion for the threshold.

### **Reviewer 3**

The manuscript improved a lot, and now the content of the study, and what the authors did, is much clearer. There are still issues with the English, and I would again suggest the manuscript to be proof read by a mother language. Below a list of minor comments.

pag 1, line 15: substitute excesses with exceedances

pag 3, line 6-7: this method makes the mosto of the samples ...., this sentence is unclear

pag 4, line 1: substitute everywhere maximal with maximum

pag 4, line 3: substutute "some unselected maximale swh" with "some unselected peaks of swh"

pag 4, line 7: substitute everywhere minimal with minimum

pag 4, line 18: substitute "(the acronym is ATSME)" with "(ATSME)"

pag 5, line 8: maximal -> maximum

pag 6, line 3: maximal -> maximum

pag 6, line 15: substitute excess with exceedance

pag 6, line 13: "return significant wave height for the i-year" is very unclear, substitute with "i-year return level of significant wave height", or "i-year return significant wave height".

pag 7, line 6: the first sentence is not entirely clear. Are u1..um the tested thresholds?

pag 7, line 7: substitute "return significant wave height for the i-year" with "i-years return level of significant wave height".

pag 8, line 12: I would suggest to reformulated paragraph 2.2, starting with and explanation of what ATSME is in plain language, and then write in detail the algorithmic processes.

pag 9, line 9: Is it the ERA-INTERIM reanalysis? Then write it and cite the references.

pag 9, line 9: After European Centre for ... add (ECMWF)

pag 9, line 16: the number is 247 to 403, from what do these different numbers come?

pag 11, line 16: the lower bound of the range is constant. Is it meaningful to select a threshold valid for all the return periods?

pag 12, 13, 14: maximal -> maximum

section 5: I understand that the bimodal distribution of Hs is a consequence of the sampling: the values beyond the separation will be, generally, the TC within 300km from the point, the ones below the TC beyond 300km selected for another point (correct?) So, I guess, a correct threshold should be higher than the separation between the 2 modes.

Wouldn't it be simpler to select for a given location just the TC within 300km from that point? Would this remove the bimodal shape and/or have impact on the performance of ATSME?

section 5: In my opinion there is still room for improvement in this section. It should be stated more explicitly, that the bimodal shape of the distribution is a result of the sampling technique, that a correct threshold should be beyond the separation, and that (if) the upper boundary of the ATSME range satisfies this requirement.

pag 18: I would include location 1 in table 2.

pag 18: in table 2 I would also indicate the value of the separation

### **Reviewer 1**

The manuscript is significantly improved from the first submission and the authors should be commended for the level of detail at which they have addressed the reviewers' comments. The direction and flow of the paper is better, as is some of the technical explanation.

I still believe some of the paragraphs in the introduction can be broken down into smaller paragraphs for readability.

It would help if the headings for sections 2.1 and 2.2 were written in full rather than using acronyms.

Have the authors read any of the work by Young et al. regarding the relationships between tropical cyclones and wave fields? There is some very relevant information in his work that could be referenced in your paper. For example:

Young (2017). A review of parametric descriptions of tropical cyclone wind-wave generation. *Atmosphere*. 8(194).

Young and Vinoth (2013). An extended fetch model for the spatial distribution of tropical cyclone wind waves as observed by altimeter. *Ocean Engineering*, 70, 14-24.

My recommendation is for acceptance with minor revision.