Natural Hazards
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Discussions

Interactive comment on "Bayesian trend analysis of extreme wind using observed and hindcast series off Catalan coast, NW Mediterranean Sea" *by* M. I. Ortego et al.

Anonymous Referee #1

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This paper presents a methodology to analyse different sources of data and to assess potential time drifts and systematic regime discrepancies between them. The paper is well written and the proposed methodology can be useful in the joint analysis of observations and modelled data. I'm not able to evaluate the details of the methodology but I think that the data chosen for the analysis have strong limitations that could be overcome with other available datasets. Therefore, I recommend the paper for publication after some major issues are properly addressed.

Major comments

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Interactive Discussion

Discussion Paper

A) I think that the use of non-overlapping data is a limitation in this study. How can be known if the differences between hindcast and observations are due to the source of the data rather than to the period of observation?. I think that the authors could find other datasets covering the same period. For instance , Puertos del Estado or the XIOM network have longer time series in this region. Moreover, there are several other wave products readily available and covering until present (e.g. the WANA database from Puertos del Estado). Furthermore, the methodology could be tested with wind data over land, which is more easily accessible. With overlapping data the same experiment run in this study could be done discarding part of the records. Then, the results could be validated using the whole record. Additionally, the buoy record is short and this can affect the realibility of the parameter fitting. You could compare the results of the fitting of HIPOCAS data when using a short record instead of the long record in order to see if up to which extent this may affect the reliability of the results.

B) I miss a discussion on the contribution of this paper related to other existing works and the authors could highlight the improvement brought by this new methodology. Also, the authors do not discuss the implications of their assumptions in the methodology.

Minor comments

Wind data. I think that the HIPOCAS database does not provide 10 minute average wind speed but hourly data. Are the buoy data homogenized to the same frequency sampling than HIPOCAS? Also, how the gaps in the data affect the results?

P.804 L10-15. It will be illustrative to show the histogram of the data together with the GPD in order to see the suitability of this function to the data.

P.808 L13-14 "we adopt here the latter parametrisation". Which one?

P809. L8-11 Under which criterium do you define the "compatibility"?

P812. L15 The definition of non-significative seems a bit arbitrary. How do you define

significance? You could provide up to which confidence level you consider it is non-significant (e.g. it is non-significant at the 80% level). Also, the changes in \sigma_\nu are non-significant at a similar level, so the sentence should go in the same sense and not suggesting that there are differences. In summary, the point is that it can't be said that there are or there are not differences among series.

Additionally, looking at Fig. 2 it seems that there is some inconsistency. Fig. 2 clearly shows a decrease in the extreme events during the Buoy period. Isn't this contradictory with the fact of having positive \sigma_\nu ? Maybe I misunderstood the meaning of the different parameters, in which case I think that it could help to the non-expert reader to discuss the results in terms of physical meaning. What does these results mean in terms of extreme events characteristics (intensity, frequency, length . . .).

P813 L24-28. This is speculative. The model is not run in a daily basis but at much higher frequency. The daily averaging is a post-process, so there is no indication that the model has stronger inertia. This links with my first comment, are the buoy data averaged to produce the same variable (i.e. daily averaged winds) that the hindcast data? Also, having more inertia does not mean to have more energy. These results could be easily confirmed using overlapped data.

P814. L4. You have analysed a single time series from REMO, not the dataset.

P814. L5. "In front of the Tarragona coast"

Fig. 1. Enlarge the circle and the cross

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