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Ocean Science Discussions
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Interactive comment on "A Monte Carlo simulation of multivariate general Pareto distribution and its application" *by* L. Yao et al.

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General Comments This paper uses a Monte Carlo simulation in order to model with a Multivariate Pareto Distribution, bivariate data consisting of two series of sea wind and wave records in the period 1960-1982. Based on my reading, I am unable to recommend the publication of this paper in its current form. In particular, the manuscript is hard to follow as no explanations are given. Thank you very much for your suggestions and helpful comments to our work. Here we copy your original comments, which are followed by our replies. The revised paper has made large changes. Many statements have been modified.

Specific Comments: âĂć There is not any section describing the used dataset (i.e. I was not able to find the time resolution of the dataset.)

We have now discussed this point in the section 3.1 in the revised paper (Page 8, line 18-25). And added the Fig.1 to show the location of ZL ocean hydrological station.

âĂć The method description is confused and explained in general without any reference to the considered variables.

More explain have added in line 12-25, Page 4.

âĂć It is not clear as the authors have got the standard marginal distribution from observations: are the uniform marginal values expressed in Frechet units? By looking in Figure 1 it seems that authors fitted the observation records with some univariate model, but it would be better to explain in details and clearly what they have done to model each single variable, and which kind of distribution formula they have used to transform data in standard unit. As an example if the authors have used Pareto distribution to model marginal data, I would expect a discussion on how they have chosen the threshold.

The marginal distributions are expressed in GEVD, before choosing the joint threshold. According to MGPD theory, after choosing the joint threshold, the marginal distributions are Pareto distributions. The standard marginal distribution in MGPD isn't the Frechet units. A new method is used in line 10-14, Page 10.

âĂć Goodness of fit: In figure 1 the authors have shown the probability plot in order to test the goodness of fit performed to the univariate variables, it would be better not to use only graphical methods, but also some statistical hypothesis testing in order to quantify the significance level of the goodness of fit by reporting the p-value. However, in Figure 1 the graphical "Fitting testing" seems to represent a discrete distribution and not a continues one as expected, due to the nature of the used variables. In Fig.1a we see that all the wind values in the range 0.4 and 0.6 (standard unit) show the same probability. Authors should explain why they have got the same probability for a range of observed values. If the single marginal considered variables are not well modeled, then the joint distribution cannot be modeled correctly as well. For this reason the

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11, C1392–C1397, 2015

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interpretation and conclusion are not adequately supported by the evidence presented. I think the paper has to be completely rewritten before resubmission. In addition if from one side the paper use novel data trying to model them with very advanced tools, not substantial conclusion are reached.

For be better to show the "Fitting testing", the figure 2 add the distribution function plots. Due to restrictions with observation technologies at the time, the wind speed and the wave height were kept only the integer and one decimal place respectively. This will influence the level of precision of extreme value, so in fig. 2 (a), the all the wind values in the range 0.4 and 0.6 (standard unit) show the same probability.

Please also note the supplement to this comment:
http://www.ocean-sci-discuss.net/11/C1392/2015/osd-11-C1392-2015-supplement.pdf

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Interactive comment on Ocean Sci. Discuss., 11, 2733, 2014.

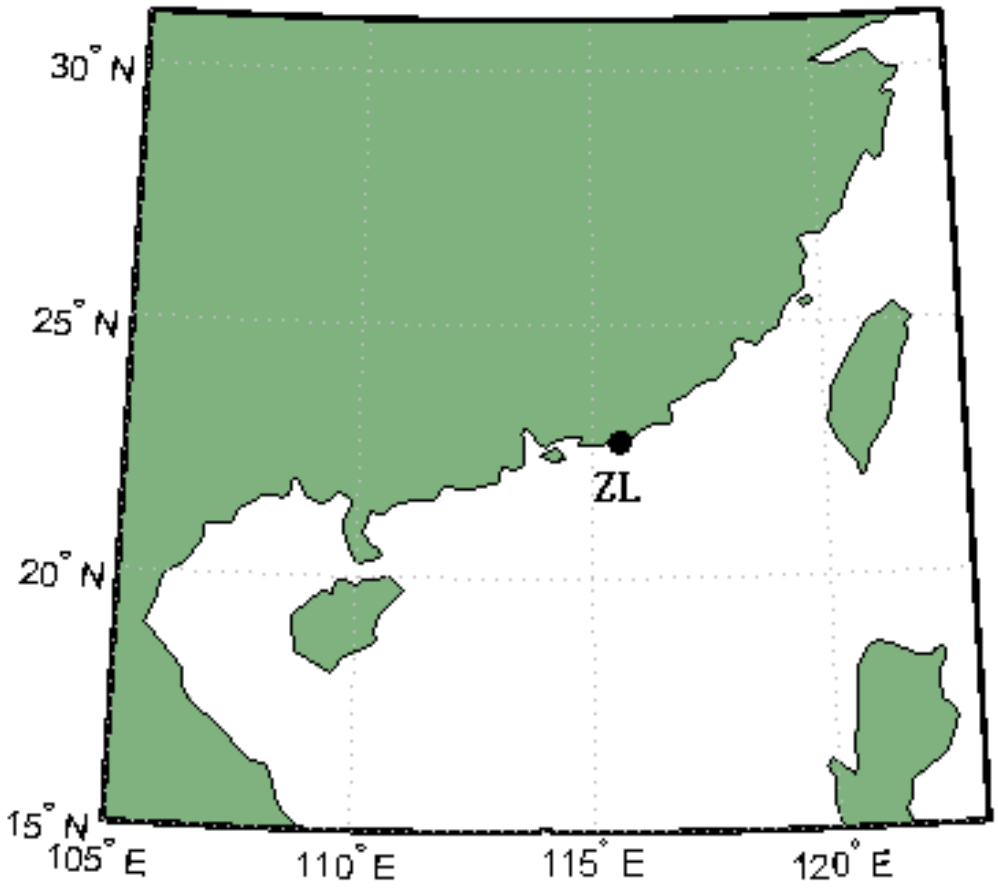

Fig. 1.

OSD
11, C1392–C1397, 2015

OSD
11, C1392–C1397, 2015

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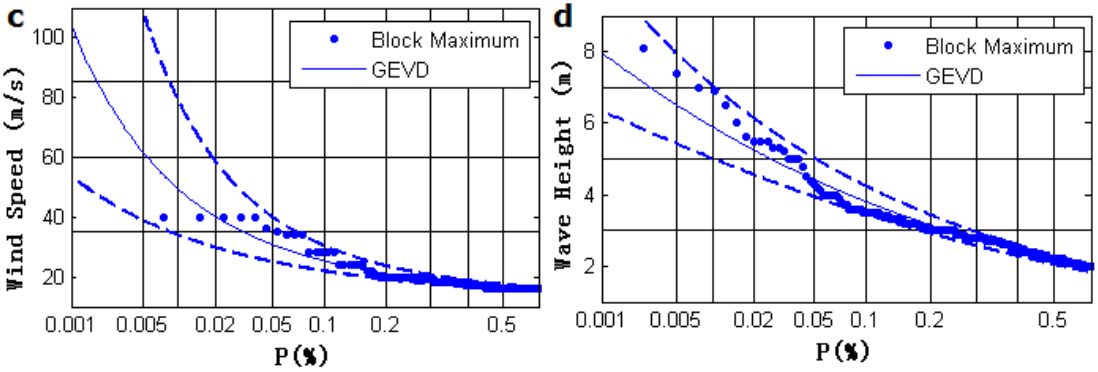

Fig. 2.

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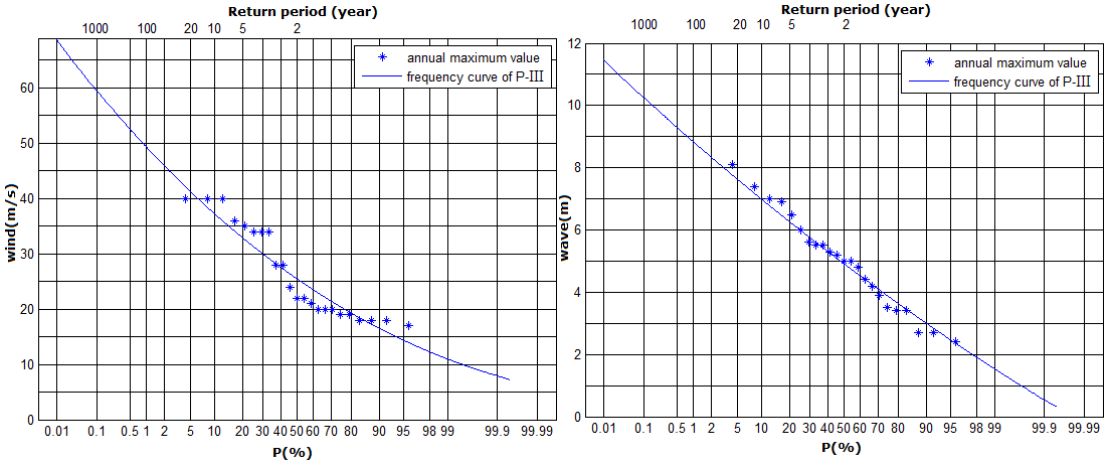

Fig. 3.

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