

## ***Interactive comment on “A Statistical Analysis of Rogue Waves in the Southern North Sea” by Ina Teutsch et al.***

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We thank Referee #2 for the constructive comments that have helped us to clarify and improve some points in our manuscript. In the following, we show how we will address the individual issues raised by the reviewer in the revised manuscript.

1. We thank the reviewer for highlighting the different definitions of the significant wave height. However, we do not fully agree here. We used the traditional mean of the “highest third” criterion for  $H_s$  throughout the study. The “four standard deviations” criterion can be obtained from the Rayleigh distribution, which nevertheless does not affect our choices and parameters (cf. e.g. Holthuisen 2007, p. 68ff). Our approach is consistent with approaches taken in other

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observational-based studies [Soares (2003), Magnusson (2003), Stansell (2004), Waseda (2011), Baschek and Imai (2011)].

2. We are grateful to the reviewer for pointing out that our assumptions are open to debate to some extent. We completely agree with the reviewer. We will revise the text accordingly taking the narrow-band assumption and the cited reference into account.
3. The typing error will be corrected.
4. We will introduce the definition in the text.
5. In Figures 7 and 9, the red curve shows the frequency with which a given relative wave height was exceeded in the measurement data, without information on how many waves this result is based on. If, for example, the red curve shows that approx. 1 in 6,000 waves is a rogue wave, we could not immediately infer how many waves this result is based on. Therefore, the blue bars also show the absolute number of waves measured in each category. The number can be read from the y-axis on the right-hand side of the figure. We have divided the relative wave height axis into 100 bins. We present the blue bars additionally to the curves, to clarify that the findings on the right edge of the figure are based only on a few measured waves. We will rewrite the caption to make this more explicit and clearer.
6. The reviewer is right and we will modify the text accordingly. Also following the suggestion by Referee #1 we provide information on typical  $kh$  values for each site.
7. We are grateful for this comment, which is relevant for our analyses shown in Figure 12. The comment led us to rethink our choice of how we approximated the dispersion relation. We will now use the full dispersion relation in the revised manuscript.



8. Thank you very much for the additional reference and the suggested interesting analysis. We will include this point into the discussion in a revised manuscript but we will leave the full analysis to a follow-up manuscript.

**References:**

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Discussion paper



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