Nonlinear Processes
in Geophysics
Discussions

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Interactive
comment

Interactive comment on "Localized Coherence of Freak Waves" *by* A. L. Latifah and E. van Groesen

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We thank the referee for his remark that the study is interesting and novel and can be accepted for publication. The referee is correct to note that our approach is based on the dispersive effect to explain at least one form of freak wave appearance. We agree very much with the referee that it would be very interesting to broaden the research from uni-to multi-directional waves. To our present understanding, directional spreading in realistic sea states could very well influence a dispersive focussing effect. We refer to the interesting paper,

Adcock TAA, Taylor PH, Draper S.: Nonlinear dynamics of wave-groups in random seas: unexpected walls of water in the open ocean. Proc. R. Soc. A, 471(2184): 2015.0660, 2015.

Numerical simulations in that paper indicate that nonlinearity, on average, does not increase the amplitude of linear extreme events, but that the shape of the extreme crest is changed. Details of the shape, coherence and local propagation directions in (linear) random seas is however not part of that study. This makes the suggestion of the referee to extend our investigations to multi-directional waves even more understandable and desirable. However, the referee may agree that such investigations go far beyond the scope of the present manuscript and will require substantial time and effort. Our interest for the extension to multi-directional case is clear, and we may have the analytical and numerical means to investigate this topic, but cannot at this moment foresee or speculate when new insights are mature enough for publication.

The more technical comments of the referee have been dealt with as follows:

- In the basic theory such as Fourier and wavelet transformation in Section 2 and 3, the dimensionless form are used. We used the dimension form in the study cases, therefore we add the corresponding units in all results in Section 4.

- To be consistent, we have corrected the temporal axis in all graphs with title 't' and added the unit. The 'Time signal' means the surface elevation in meters. To make it clear, we change the axis figures labelled by 'Time signal' to be η[m]. We also add axis in some figures with no axis before.

- The wave field characteristics, i.e. the peak period (instead of peak frequency) and the significant wave height are already given in the paragraphs, except in the dispersive focusing waves. Then, we will add the characteristics for the dispersive focusing waves. Additionally, we also add the spectral shape of the influx signal for each example.

- We agree with the referee that the scaling (1:50) in section 4.3 is irrelevant to the goals of the paper and makes a confusing for the readers. Therefore, we will

present the fourth study case without any scaling and adjust the results related to the case with the actual measured dimension in the laboratory experiment.

- The AB model has been added as an appendix.

- The misspelled name of Pelinovsky has been corrected.

All changes and corrections can be seen in the supplement file.

Please also note the supplement to this comment: http://www.nonlin-processes-geophys-discuss.net/npg-2016-31/npg-2016-31-AC2-supplement.pdf

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