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Nonlinear Processes in Geophysics
Discussions
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Interactive comment on "Localized Coherence of Freak Waves" *by* A. L. Latifah and E. van Groesen

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We thank the anonymous referee #1 for the positive and constructive remarks. Just like the referee, we struggled to improve and simplify the presentation of the technical results. In section 2 we tried to illustrate in a simple way the role of coherence by considering the (weak) pseudo-maximal signals. Then, to justify the use of the wavelet transform, we showed how the coherence of phase information could be obtained using the information at a single time, and then how much more precise and meaningful phase information is obtained from wavelet techniques, shown graphically in Figures 5 and 6.
The new integral expressions try to quantify the coherence.
An example of the practical use of the results could be early warning of freak waves (for the time being for long crested waves) from radar images of the sea far away from a ship, a topic that is investigated in ongoing research (see Wijaya et al., 2015 and

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Wijaya and Groesen, 2016).
The more technical suggestions and comments of the referee have been dealt with as follows:

1. Page 2 line 10 will be revised as follows:

   "Pelinovsky et al. (2011) discussed a freak wave of the solitary-like shape that is originated from the wave packet and is based on the dispersive focusing of unidirectional wave packets."

2. Based on the pm signal definition in (1), there should be only one argument $(t = 0)$ in the equation (3). We have revised it as $[\eta_{pm}(0)]_{\alpha}$.

3. No, it is not 2. The γ is 1.9 as on page 11. We consider the JONSWAP spectrum in the normal sea condition for the illustration mentioned on page 4 line 13 and Figure 2. We added this note in the caption of Figure 2 as follows:

   "The random signal corresponds to a Jonswap spectrum with Hs = 6.3m and $\gamma = 1.9$."

4. We believe what Anonymous Referee $\#1$ meant is page 7 line 10. We have replaced the value as suggested, $3.8 * 10^{-8}$.

5. We added an Appendix that briefly describes the AB equation. It can be seen in the Supplement file.

6. We have revised the list of references and also fixed the typo in the mentioned reference, as the following:

   Baldock, T. E., Swan, C., and Taylor, P. H.: A laboratory study of surface waves on water, Phil Trans. R. Soc. Lond. A, 354, 649–676, 1996.

Kharif, C., Pelinovsky, E., Talipova, T., and Slunyaev, A.: Focusing of Nonlinear Wave Groups in Deep Water, JETP Letters, 73, 170–175, 2001.

Kharif, C., Pelinovsky, E., and Slunyaev, A.: Rogue waves in the Ocean, Advances in Geophysical and Environmental Mechanics and Mathematics, Springer-Verlag, Berlin Heidelberg, 2009.

References

A.P. Wijaya, P. Naaijen, Andonowati and E. van Groesen, Spatial evolution scenario from synthetic radar images to sea states near the radar, Ocean Engineering, 106, 261-270, 2015.

A.P. Wijaya and E. van Groesen, Significant wave height retrieval from synthetic radar images, Ocean Engineering, 114, 204-215, 2016.

Please also note the supplement to this comment:
http://www.nonlin-processes-geophys-discuss.net/npg-2016-31/npg-2016-31-AC1-supplement.pdf

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