REVIEW OF 'A PROGNOSTIC MODEL OF THE SEA ICE FLOE SIZE AND THICKNESS DISTRIBUTION'

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1. General comments

Most of my comments in the last review have been addressed satisfactorily, but there is one in particular that is quite important that was not adequately addressed by the authors.

2. Specific comments

(1) eqn (20) and previous 3 paragraphs: I believe that my comment about using the formula

$$a_i^2 = 2\int_{\lambda_0}^{\lambda_1} S(\lambda)\delta\lambda \approx 2S(\lambda_i)\Delta\lambda \tag{1}$$

to determine the breaking probability of a single frequency has not been fully understood. To me it only makes sense to use (1) when there are physical reasons to choose the limits of integration λ_0 and λ_1, or when the actual values of the amplitude are not so important. [1] would fall into the former category, when they filtered high frequencies out of H_s to compare to measurements. [2], who the authors cite in support of their approach, falls into the latter category, where the authors grouped the amplitudes into bins of different magnitudes, finding higher amplitudes were attenuated more strongly than lower ones (for this conclusion to be reached only relative magnitudes are important). In contrast the authors are trying to find absolute values of the amplitudes and then using them to determine if break-up occurs on a frequency-by-frequency level. Their doing so relates to my fellow reviewer's question about convergence. If they halve $\Delta\lambda$, they halve a_i^2 so in the limit as $\Delta\lambda \to 0$, the breaking probability also tends to 0 for all frequencies, and consequently there will be no breaking at all.

(2) Equation (20) (this is possibly redundant given my previous comment): $\varepsilon_{crit} > \varepsilon_{\max}$ $\to \varepsilon_{crit} < \varepsilon_{\max}$

(3) I am also still of the opinion that using a Rayleigh distribution for individual frequencies instead of the spectrum as a whole is suspicious.

References

[1] C. O. Collins, III, W. E. Rogers, A. V. Marchenko, and A. V. Babanin. In Situ Measurements of an energetic wave event in the Arctic marginal ice zone. *Geophys. Res. Let.*, 2015.

[2] M. H. Meylan, L. G. Bennetts, and A. L. Kohout. In-situ measurements and analysis of ocean waves in the Antarctic marginal ice zone. *Geophys. Res. Lett.*, 2014.