

## ***Interactive comment on “Toward a coupled model to investigate wave-sea ice interactions in the Arctic marginal ice zone” by Guillaume Boutin et al.***

### **Anonymous Referee #1**

Received and published: 30 June 2019

This is an excellent paper. It clearly demonstrates the need to include ocean wind wave effects as part of a sea ice modelling frame work. The paper does not attempt to include all possible wave effects, for all situations, but rather, it limits itself to the role of the momentum flux due to waves attenuation by sea ice and the role of wave-induced sea ice break-up in lateral melt. There are many more steps towards the full inclusion of ocean waves into the sea ice modelling framework but this is a good first step.

Minor corrections:

Page 1, line 22: consider adding Waseda et al. 2018 to Thomson and Rogers 2014  
Waseda et al. (2018): Correlated Increase of High Ocean Waves and Winds in the

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Ice-Free Waters of the Arctic Ocean. Scientific Reports, 8, Article number: 4489  
<https://www.nature.com/articles/s41598-018-22500-9> Page 2, line 4: consider adding  
Bateson et al. (2019) Adam W. Bateson et al, 2019: Impact of floe size distribution  
on seasonal fragmentation and melt of Arctic sea ice. <https://www.the-cryosphere-discuss.net/tc-2019-44/>

Page 4, line 27: some fetch for the generation of sea ice. It is what you mean or rather  
some fetch for the generation of sea waves (?) Page 5, (1). I assume that Sice is  
defined as being positive, hence in WW3, it appears as  $-Sice$ . Just clarify. Page 6, line  
9: panels b,e → panels b,d Page 10, line 19 : there is no figure 5 e nor (line 21), 5 f

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Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2019-92>, 2019.

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