

This is an excellent paper. It clearly demonstrates the need to include ocean wind wave effects as part of a sea ice modelling framework. 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.

We thank the reviewer for their careful reading of our manuscript and for their comments and suggestions. We have tried to address their questions and concerns, as detailed in the following. In our comments, PXY refers to page X line Y of the attached updated manuscript.

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 Ice-Free Waters of the Arctic Ocean. Scientific Reports, 8, Article number: 4489
<https://www.nature.com/articles/s41598-018-22500-9>

We have added these references (P2L3).

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>

We have added the reference later in the text, but did so in some other places where it seemed more relevant to us (P3L8, P14L13...).

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 (?)

It was indeed a typo and we have fixed it.

Page 5, (1). I assume that Sice is defined as being positive, hence in WW3, it appears as -Sice. Just clarify.

Our definition of Sice has been clarified in the updated manuscript (P6L14).

Page 6, line9: panels b,e→panels b,d

Fixed

Page 10, line 19 : there is no figure 5 e nor (line 21), 5 f

Fixed