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Interactive comment on "Wave boundary layer model in SWAN revisited" *by* Jianting Du et al.

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Overview:

In this paper the authors extend the study presented in Du et al. (2017), to make the Wave Boundary Layer Model (WBLM) developed there for SWAN model, applicable for real wave simulations. In order to do that, several improvements on the WBLM wind-input and white-capping dissipation source functions are realized:

a) First, the WBLM wind-input source function is modified by considering the wind profile change in the estimation of the non-dimensional critical height

b) Second, a new white-capping dissipation source function is applied which enables WBLM methods being used for varying wind conditions

And finally, several improvements are made to the numerical WBLM algorithm , which

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Discussion paper

the authors explain that increase the model's numerical stability and computational efficiency.

This new WBLM is calibrated and validated again theoretical and real examples (in particular, during two North Sea storms) and it shown better performance in the simulations of Hs and Tz than the original source term.

General comments:

In my opinion, the first sections of the paper (Introduction, methods, experiments and results) are generally clearly written and readable. However, discussion and conclusion chapters should be expanded and improved. In particular, WBLM should be discussed more there in terms of the physics. Some ideas in order to discuss could be:

1. Page 3, equation 5: the possible effect of directional dispersion
2. Page 4, equation 11: introduction of the wave age tuning parameter
3. Page 4, equation 13: the possible effect of over/under dissipation at high frequencies
4. Page 5, lines 17-18: Â£How this applies to cases like modal waves?
5. Page 10, equation 22: the role of to scale U' with 10 m/s

Overall this paper needs moderate revision before acceptance for publication

Detailed comments:

1. Page 6, lines 17-18: Include some table comparing calculation times in the same examples for the WBLM (new and previous version), KOM and JANS formulations
2. Pag.10, line 25: Change Tp for fp
3. Figure 2: (title) Change Tp for fp

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