

Dear Editor and Referees,

We sincerely thank everyone for their time, constructive feedback and insightful comments. As the answers to the reviewers have already been uploaded, we will compile here a list of last changes on the manuscript as uploaded. All changes in the manuscript are marked in blue in the track-changes file.

- The analysis of the phases is moved to the Appendix.
- Regarding the first reviewers question about the non-simultaneous failure (Line 191-197): In the reviewer answers we announced an additional Figure, but we decided against adding the additional Figure as Figure 2 already highlights non-simultaneous failure. We included a reference to accepted conference proceedings, where we compared the simulations with $L = 10$ m to simulations with $L = 60$ m as presented here. According to our knowledge, these are not published yet, but we are happy to forward the paper to the reviewers if requested.

To address the editor's suggestion to expand on the potential impact for future modelling studies, we added:

- L225: "related to the development of rheological models for pack ice and"
- L241: "; three dimensional DEM suggests that the ice strength, as often defined in continuum models, should increase linearly with h "

Additionally, the last paragraph of the conclusions (L261-267) expanded on this topic as well based on the reviewer comments.

Best regards,

Marek Muchow and Arttu Polojärvi

ADDITIONAL REFERENCES

Muchow, M. and Polojärvi, A.: Discrete Element Simulations on Pressure Ridge Formation: How the Length-Inclusion Facilitates New Research Avenues, Proceedings of the 27th IAHR International Symposium on Ice (electronic publication), accepted