

Dear Dr Stef Lhermitte,

On behalf of my co-authors, I am pleased to resubmit our manuscript entitled "Ongoing grounding line retreat and fracturation initiated at the Petermann Glacier ice shelf, Greenland after 2016" after minor revisions, for publication in The Cryosphere.

We answered all the remaining comments from the reviewers, including on the timing of events in the Discussion section and reclarified some parts of the text.

You will find attached the manuscript, five figures, along with the tracked changes and response to all specific comments from Reviewer #1 and #2.

Please do not hesitate to reach out should you have any questions about our submission. Best regards,

On behalf of all authors,

Dr. Romain Millan

Response to Reviewer #1

The authors improved the manuscript and is ready for publication after two minor technical corrections:

Authors: We would like to thank Reviewer #1 in helping to improve the quality of our manuscript throughout two rounds of revisions.

L48: the word "lost" appears to be missing.

Authors: Done.

References: "Flament & Rémy 2017", cited in L224, is missing in the References list.

Authors: We added the reference accordingly at L300

Response to Reviewer #2

I thank the authors for addressing my previous comments and for their hard work improving the manuscript. I particularly appreciate the clarification on the timing of the events and the improvements made to the Discussion. I have just a few additional comments, but otherwise I am happy to recommend the manuscript be published.

Authors: We would like to thank Reviewer #2 in helping to improve the quality of our manuscript. We have addressed the remainder of the concerns below.

Minor comments:

Line 22: Change to “followed” or “occurred after”

Authors: Done.

Line 53: “Has” instead of “have”

Authors: Done.

Line 81: Put the reference for the GIMP v1 DEM as it is the first time it is introduced. Also, Howat et al. 2017 doesn't appear in the reference list.

Authors: Done. We have added the reference to GIMP v1 (Howat et al 2014 at L82), and added Howat et al., 2017 to the reference list L305-310.

Line 92: Perhaps change “complete” to “complement”

Authors: Done.

Line 198: Can you improve the link between these sentences? It wasn't fully clear to me how constant velocities between 1986 and 2010 are then consistent with the results of Rückamp et al. 2019 presented after 2012.

Authors: We moved this sentence to the second paragraph of the discussion, where it belonged initially (see L211-212).

Line 207: Can you clarify again what may have caused the “loss of ice shelf resistance” and restate the timeframe. I'm also not sure the Gudmundsson reference is correct here (see following comment).

Authors: We have clarified that the cause of the loss of buttressing was due to the 2012 calving event (L209), and restated the dates of the events at L209-210. The reference to Gudmundson was removed from the sentence (see next comment).

Line 222: The caveat (ice shelf buttressing) to bed slope being the only control on future retreat (Gudmundsson et al. 2012) I think would be better be added to this third paragraph with some additional explanation.

Authors: We have added the reference to Gudmundson at L226-228, along with an explanation on why the current conditions at Petermann may promote future retreat.

Line 238: Perhaps reiterate why rising ocean temperatures can lead to retreat of the grounding line here.

Authors: We clarified this sentence at L237.

Line 240: Is there a reference for this statement that ocean temperatures may have caused large calving events in 2010 and 2012?

Authors: The sentence was removed accordingly.