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The Cryosphere Discussions

# *Interactive comment on* "West Antarctic sites for subglacial drilling to test for past ice-sheet collapse" *by* Perry Spector et al.

**Perry Spector et al.**

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Dear Dr. Stroeven (editor),

We thank the reviewers for their helpful feedback, which has improved our manuscript. In the Interactive Discussion, we have replied to each Reviewer directly. Attached to this comment is a pdf of our revised manuscript.

We would also like to bring to your attention the fact that we have made some changes to the manuscript regarding issues that were not raised by the Reviewers. These changes are described below.



In the last paragraph of Section 5.3, we have changed the sentence which read "Circulation of drilling fluid in the RB-1 borehole hydrofractured the basal ice...". The new sentence reads "An unexplained hydrofracture of the basal ice of the RB-1 borehole...".

After our initial manuscript submission, we realized that the present-day grounding line in our ice-sheet simulation was located upstream of Robin Subglacial Basin in the Weddell Sea sector of the WAIS (compare to Fig. 1). This misfit affects the plots in Fig. 2e-s because, at sites upstream of this area, thinning during interglacial periods is underestimated and thickening during glacial periods is overestimated. To address this, we have taken the following actions.

(i) We have added a figure (Fig. 3 in the revised manuscript) showing the misfit between the modeled and the observed present-day ice sheet. This figure shows that the model does reasonably well in most areas, but very poorly in the region of Robin Subglacial Basin.

(ii) We added a paragraph to the end of Section 3 explaining this misfit and its consequences.

(iii) We have added text to the caption of Fig. 2 to make the reader aware of this issue. In the pdf attached to this comment, the caption gets cut off by the page break. The text that we have added to the caption reads: "As shown in Fig. 3 and as discussed in the text, the modeled present-day ice sheet places the grounding line upstream of Robin Subglacial Basin (compare to Fig. 1). A result of this misfit is that, for sites upstream of this area, ice-thickness changes shown in panels (e-s) underestimate the thinning during interglacial periods and overestimate the thickening during glacial periods."

We hope that you find our edits satisfactory for publication of the manuscript in The Cryosphere.

Kind regards,

Perry Spector (on behalf of all co-authors)

Please also note the supplement to this comment:
https://www.the-cryosphere-discuss.net/tc-2018-88/tc-2018-88-AC3-supplement.pdf

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