The Cryosphere Discuss.,
https://doi.org/10.5194/tc-2020-54-AC1, 2020

The Cryosphere Discussions

TCD

Interactive comment

Interactive comment on "Subglacial sediment transport upstream of a basal channel in the ice shelf of Support Force Glacier (West Antarctica), identified by reflection seismics" *by* Coen Hofstede et al.

Coen Hofstede et al.

coen.hofstede@awi.de

Received and published: 16 August 2020

Dear reviewers,

Many thanks for your input in helping improve this manuscript. My apologies for the delay, it took longer than I had expected.

General comments: We would like to adjust our interpretation: The off-nadir reflections probably come from the subglacial channel connecting to the basal channel. Through interaction with the warmer ocean the subglacial channel increases its when approach-

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Discussion paper

ing the grounding line. In our answer to reviewer #2 we explain our adjusted interpretation elaborately.

Abstract: Agreed.

P2 L7-8: Agreed.

P3 L12: Corrected.

P3 L16: Agreed. Both the seismic and radar surveys took place in January 2020, the radar survey shortly after the seismic survey.

Figure 1: Agreed.

P6 L3: Agreed.

P6 L4: Indeed, thanks.

P6 L5: Agreed.

P6 L7 :Well spotted, thanks.

P6 L10: Yes it does make the text more readable. Agreed.

P7 L9: Thanks we will.

P7 L11: Good suggestion.

P7 L14 : Agreed.

P7 L20: Agreed.

Table2: Agreed.

P9 L15: Correct, based on the center frequency.

P9 L19: Very good point, indeed we mean uncertainty.

Section 3.1: Agreed, it is not an artefact. We'll use "Seabed-depth conversion".

Figure 2: Yes we agree and will add the schematic versions. Regarding the subglacial feature, I think the raw shots give the best indication we are dealing with reflections and will add them here. Lastly, I'm glad you appreciate the lay-out of figure 2.

Figure 2 caption: Agreed.

P11 L3: Yes we agree, we'd like to call this the"subglacial feature" .

P11 L7-8: Yes we think so, the loss must be greater at the gradual ice-seawater contact. We point this out in the discussion (page 20 L6-9) as a general comment, not restricted to interval 2. However in interval 2 the seabed contact occasionally switches polarity, which suggest small magnitudes and we get pretty high amplitudes from deeper down the sedimentary sequence with chaotic reflections.

P12 L17: Correct this happened unintentionally so we will use your suggestion, thanks.

P12 L17-19: We prefer to take it out. The figure is easily misunderstood.

P12 L20-21: The double ice-sea contacts and seabed reflections are caused by different pathways and thus different reflection areas of the seabed. Correct depth converting is actually impossible, what horizon do you pick for depth conversion? Either choice of ice-seawater contact (channel crest or base) will only partly convert the reflections to the correct depth.

Figure 4: Thank you, detonating cord at firn works very well.

Page 15 L15-18: Agreed.

Figure 6: Agreed.

Section 4.3: Agreed.

P18 L11-12: I will add the raw shots, showing the feature (Fig1:profileI_subglacial_feature_SPs.png). The feature is visible over 1200 m. That is a long distance for a diffraction. Especially SP 15, where we see a reflection splitting off the subglacial feature, shows they are probably reflections. If they had been diffractions I would expect to see them cross each other. Please let me have your judgement again with this extra image. Thanks.

P20 L4: Indeed, we mean magnitude and will add this.

P20 L16: Indeed the term disturbed is not well chosen, we'd like to use chaotic so we refer to a "sedimentary sequence with chaotic reflections". In our answer to reviewer #2 we answer this more elaborately.

P22 L5-6: We'll use planar. Thanks.

P22 L19: Yes now actually Daniel (Steinhage) worked with Bradley and I was shown around by Dave Routledge. We met each other at the shelf of Support Force Glacier and then did this survey together. It worked like clockwork.

Supplement: Thank you, this is highly appreciated.

Best regards, Coen Hofstede

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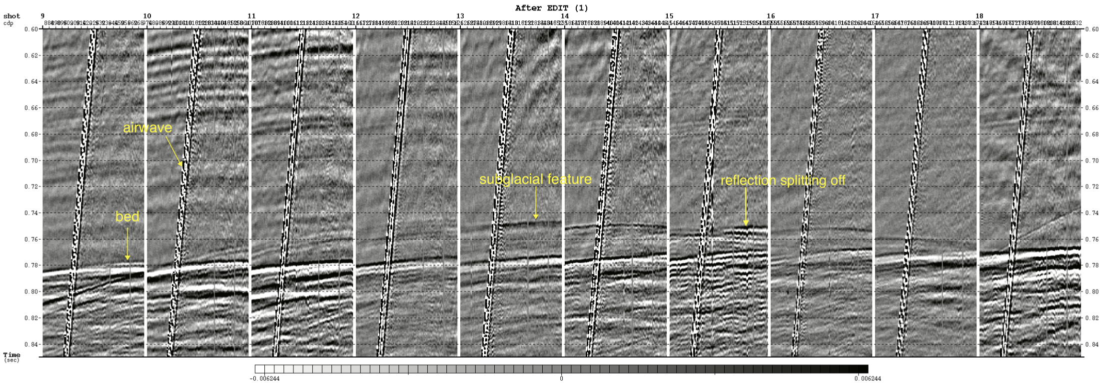
After EDIT (1)
shot
cdp
Time (sec)
airwave
bed
subglacial feature
reflection splitting off
-0.006244
0
0.006244

Fig. 1.