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Discussions

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Interactive comment on "Bathymetric Controls on Calving Processes at Pine Island Glacier" by Jan Erik Arndt et al.

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Received and published: 3 March 2018

Review summary This paper provides new bathymetry and satellite data for an area recently exposed due to PIG ice shelf calving line retreat, concluding that a seafloor ridge has been important for providing back stress in the ice shelf and iceberg calving. I find the paper well-written and only have minor comments, with the exception of their interpretation of lineations on the top of the ridge being formed recently by the ice shelf (see below).

Detailed comments Page 1, Line 20 – change to 'current global mean sea-level rise'

Page 2, Line 6 – mention how significant the buttressing effect of the PIG ice shelf to the upstream glacier (e.g. Fürst et al., 2016)

Page 2, Line 24 – misspelled 'features'

Page 5, Lines 18-20 – I am not convinced the lineations were formed by an ice shelf that likely had intermittent contact with bathymetric high, as one might expect slight differences in flow direction. The second explanation of the features forming over multiple glacial cycles is favored, especially considering the ridge is most likely composed of resistant bedrock. A resistant bed is also supported by the lack of iceberg furrows on the high, which would be expected in unlithified sedimentary beds.

Fig. 1 – Consider adding another panel with a cross-section profile of the bed with annotated grounding line and calving front migration. Of course, there are lateral changes in bathymetry and ice position; however, a profile would show the landward dipping bed and the bathymetric highs nicely. This would also allow you to remove some of the water depths in the introduction section, which currently reads a bit like a list when discussing observed position changes.

Fig. 2 – Add cross sections of the ridge and across the streamline landforms.