

General comments on the review:

I am very pleased by the work done during the review process. It clarifies well most the questions I had. I have minor comments on the review below.

We thank you for the constructive and positive comments.

Specific comments:

L116: I am unfamiliar with the 'lateral basal melt'. Could you reformulate or give more explanation? How it is written, it looks a different process to the buoyant convection melt term.

The lateral ,basal' melt term accounts for the ,basal' turbulent heat transfer that occurs on the submerged iceberg sides, motivated by Bigg et al. (1997). An explanation has been added to the manuscript (L108-111 in diff.pdf).

L181: by 'the nearest ocean grid cell and the neighbouring cells are added to this list', do you mean the nearest coastal ocean grid cell as suggested in l.132?

Icebergs are not seeded in coastal grid points. These grid cells are excluded from the list of potential iceberg seeding cells (like the saturated grid cells) to reduce the risk of instantaneous grounding. So, the term „neighbouring“ means here, the neighbouring grid cells of a particular ocean grid cell that is nearest to the location of iceberg discharge, excluding coastal cells. An explanation has been added to the manuscript (L174f in diff.pdf).

L267: About the increased vertical mixing, I think it still need extra information. There is increase vertical mixing (figure on N2 / mixed layer) on the open ocean part of Amundsen Sea. I am not sure it is a direct effect of the presence of icebergs in the region as the iceberg melt will tend to stratify (and there is not many icebergs melt in the region). Based on your figure A8, I am wondering if the effect in Amundsen Sea is a consequence of the possible changes in gyre strength and extent or changes in front position.

The warming signal is most pronounced to a depth of around 100 m. To get a timeseries of this warm anomaly, we averaged ocean temperature over the upper 100 m between 110°W-130°W and 55°S-65°S. The timeseries shows a strong centennial variability but there is a persistent warm anomaly in ICB compared to CTL. The spatial distribution looks very similar to findings by Martin & Adcroft (2010) (s. Fig. 6b). However, there is no significant correlation between the temperature anomaly in this region and Weddell Gyre strength ($r=-0.20$), Drake Passage throughflow ($r=-0.12$), or the SAM index ($r=-0.20$).

A paragraph has been added to the manuscript (L313-319 in diff.pdf).

L307: I don't really understand how the feature to avoid saturation in ocean grid cell facilitated the fact that icebergs tend to stay at a single location. I naively thought that if it is more difficult for the icebergs to enter in a narrow bay where they get stuck, the icebergs will move more freely and so stay less in the Antarctic cold shelf seas.

Still icebergs may accumulate in certain areas, e.g. at the tip of the Antarctic Peninsula (Fig. 3). They may block the pathway for more downstream icebergs when a grid cell is saturated, although other model icebergs are not taken into account in one single iceberg's momentum balance. An explanation has been added to the manuscript (L300-302 in diff.pdf).

Figures and tables:

Table 1: the header of the last column is not clear (references $-0.5\text{ex}>-0.5\text{ex}$ $0.5\text{ex}>0.5\text{ex}$). What is 'ex'?

This issue is only present in the diff document and not in the actual manuscript. To be honest, I don't know what happened here. This error is not present in the revised version of the manuscript or the latest diff.pdf.

Figure 4: the bottom line is Sea Ice Height. What season it is?

Figure 4 shows the sea ice height averaged over the last 100 model years, no specific season. The caption has been changed for clarification (Caption Fig. 4).