Juarez-Maritnez et al. investigated the impacts of emission scenarios, the climate forcings and the heat exchange velocity in the basal melt parameterisation on the projected Antarctic mass loss before 2500 They found that the Antarctic ice sheet contributions to sea level rise highly depend on the heat exchange velocity at the ice-ocean interface and also the climate forcing chosen at high emission scenario. Separate atmospheric-only and oceanic-only experiments show that oceanic forcing plays a dominant role for the West Antarctic while atmospheric forcing is more important for the eastern sector and the interior. Overall, the manuscript is well written. However, the model setup section and some of the descriptions on results need improvements. I'm happy to support the publication of this study after major revisions.

Here are some general comments:

In the model description, some information is missing, including how the ice front position is updated, how the basal drag is treated for partially-floating cells, the reference SMB dataset. About the moving ice front positions, how the ice front position is updated is not described at all. Is a calving included? Could you please show the difference between the ice front position after spin-up and the present-day? How would the difference affect your results?

Coarse resolution like 16 km would largely affect the estimation of mass loss and also the movement of grounding line, which would influence the basal drag and basal melting applied at the grounding line. However, nothing related with this has been discussed, which I think is important.

The section 3.1 needs to be restructured. You discuss the sensitivity to γ_0 in 1st paragraph and then discuss the sensitivity to different forcings under a medium value of γ_0 for the rest of the section. However, about the sensitivity to different forcings, you jump between different regions, different GCM forcings, low and high emissions, which is quite chaotic. The focus of each paragraph is not clear to me. About the summary paragraph in Line 245-246, it's a repeat of caption rather than a summary. I think Fig 9 is a good plot which can help you explain things earlier, which should be combined in your result description earlier.

The Sec. 3.3 describes the individual effect of the atmosphere and the ocean on the projected ice mass loss from west and east Antarctica. However, it is not enough evidence to say that atmosphere is the dominant factor to margin of East Antarctic Ice Sheet, especially for Cook Ice shelf region, Totten Glacier region and Amery Ice Shelf region. These regions are losing ice clearly and show rounding line retreat in Fig 13b. Although it is not as obvious as west antarctica, it should be discussed at least.

There are 13 figures and 4 tables in this manuscript, some of the figures are not very crucial to be included in the main manuscript, which can be moved to the supplementary material.

The resolution of some figures (Fig. 7, 8, 9, 11) is pretty low and needs to be improved. Some of the text labels on the figures appears. due to the low resolution of figures.

Specific Comments:

L21-22: citation please

L28: what is 'ejecting circa'?

L45-46: need to add citation Edwards et al., 2021

L50: ice sheet stability?

L68: ISMIP6 is short for The Ice Sheet Model Intercomparison Project for CMIP6

L115: citation for this regularized Coulomb sliding law please.

L130: you should explain specifically what γ_0 is here.

L163: is → are

L169: which GCM forcing is chosen here for period 1995-2014?

L181: (Lipscomb et al., 2021) → Lipscomb et al., (2021)

L190: imposed → kept constant?

L198-199: refer to Fig. 4a here.

L205: ocean forcing from CESM2 is not the maximum here compared with UKESM and HadGEM2

L208: 'the low-emission case' with UKESM

L213: suggest 'we can see the sea level contributions slows down in the last two centuries.'

L215: I think they are all nearly above 5 mm SLE/yr while HadGEM2 is lose to 10 mm SLET/yr.

L219: for the medium value of γ_0, no experiments reach 3 m at 2500.

L221-222: 75% + 20% is not 100%.

L227: Fig 1 did not show anything related with Amundsen and Bellingshausen sea sectors.

L228: for Amery, you need to cite Fig 7 rather than Fig 6.

L230: why do you only mention Ronne-Filchner here? Amery also shows loss of ice only for CSEM2 and CCSM4.

L233: it is not obvious to me in 2200. 2300 is more obvious.

L235: not for CCSM4

L236: what do you mean "reaching well above 300m"? the thickness?

L237: why do you exclude the PIG and Thwaites here?

L240: what do you mean "Ronne-Filchner ice shelf is larger"? If you are talking about readvance of GL (which I can't tell it well from current resolution of figure) in these regions, the ice shelf area is smaller.

L242: The ice flow is decelerating in ROSS under low emission scenario.

L253: this confused me a lot. If the ice shelf disappears from 2300 onward, why we still see floating regions in Figure 7 after 2300. From Figure7 ,the ice shelf is always there.

L263: I can not tell mass loss from WAIS changes its tendency from Fig 11.

L279: When you say 'The EAIS ice shelves also have their ice mass reduced', which plot are you talking about? Or you mean the margin of EAIS?

L280: 'in the interior and eastern areas'→'in the eastern interior'?

L297: the forcing is stopped? I thought it was just kept constant.

L312: in more than 3 meters → by more than 3 meters; 'affecting predominantly to the WAIS' → 'affecting the WAIS predominantly'

L314: I don’t understand this sentence. Do you mean through enhanced surface melting?

L319: There is also a clear mismatch between your result and Greve et al. 2022 in Table 4.

L321: Then what about the mismatch in CCSM4?

L346: unfished sentence.

L366: on Eq (3). Or you don’t need to mention it here.

L372: I think you mean a position contribution to SLR. But by saying ‘negative effect’ can be confusing.

Figures

Figure 2: Caption: the differences in thermal forcing for b).

Figure 7 & 8: I did not see the coastlines at all, which is a very import feature to be shown clearly in the figure.

Figure 8: what do you mean the cells where there is ice? I think you mean grounded ice? If yes, why the floating ice is included in UKESM LOW emission case?

Figure 12: in the AIS → from the AIS

References

Edwards, T.L., Nowicki, S., Marzeion, B. et al. Projected land ice contributions to twenty-first-century sea level rise. Nature 593, 74–82 (2021). https://doi.org/10.1038/s41586-021-03302-y