

Interactive comment on “Evaluating seasonal sea-ice cover over the Southern Ocean from the Last Glacial Maximum” by Ryan A. Green et al.

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In the Discussion section the authors state that "Despite significant differences in oceanic circulation in these two simulations, with weaker NADW and AABW in LOVECLIM2 compared to LOVECLIM1, the sea-ice cover differences between these two runs are much smaller than compared to other models. Apart from FGOALS-G2, which simulate a very strong LGM AMOC, the LGM AMOC strengths in the other PMIP3 models are similar at 21-23 Sv" Although the two LOVECLIM simulations have different AABW circulations, they both have weak AMOCs (taken from Menviel et al. 2017 table 1). So it is natural that the difference in sea ice cover between these two simulations is smaller than between them and the PMIP3 models, which all have stronger AMOCs. Could you please be more clear on how this result means that the "primary control on

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LGM austral summer sea-ice cover is not linked to the strength of the AMOC"? Especially taking into account that from Fig. 1c it looks like the two simulations that have the furthest reaching Summer sea ice are LOVECLIM1, LOVECLIM2 (both have weak and shallow AMOC), and CCSM4 (strong and shallow AMOC), which are the three simulations with the most distinct AMOC structures compared with the rest of the PMIP3 models which exhibit strong and deep AMOCs.

Thanks!

Interactive comment on Clim. Past Discuss., <https://doi.org/10.5194/cp-2020-155>, 2020.

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