This study assesses the Last Interglacial climate and ice sheet evolution in a two-way coupled approach. The novelty is in the fully coupled method. Especially promising is the simulated evolution of both the Greenland and the Antarctic ice sheet in one overarching climate-ice sheet framework, which allows for assessing their relative contributions to the global mean sea-level highstand during the Last Interglacial. As such the study is interesting as should be published. However, some parts are unclear and lack information and/or discussion.
Please discuss the comments below before publication in CP.

GENERAL COMMENTS

1) Sea-level forcing from a Red Sea record is prescribed. Are the simulated sea-level changes from the Greenland and Antarctic ice sheet somehow added to this during the simulation? How certain is the Red Sea record? And how much does it affect the sea-level contributions of the two ice sheets and the total sea-level changes simulated? The discussion on this (lines 420-424) is too short.
2) Related to this: Would it be possible to fit your model results better to the Kopp et al. (2009) reconstructions if uncertainties in the Red Sea sea-level record are included, or if you use the benthic d18O-stack? In other words can you suggest improvements to the NH ice sheet retreat records, based on the comparison between your simulations and the Kopp reconstructions?
3) Why is the temperature forcing over Greenland so high that it melts away the Greenland ice sheet entirely? What are the summer and annual mean temperature anomalies for the Last Interglacial? Please compare and discuss this with respect to proxy data, and previous climate model simulations (see e.g. Bakker et al. (2013) and Lunt et al. (2013) for global intercomparisons). The method of uniform scaling is a bit eccentric, and needs better argumentation.
4) Related to this: the experimental set-up misses a section that describes how the simulated temperatures (and accumulation) are converted to (surface) mass balance. Which scheme do you use? With which parameter settings? The latest studies simulating the Last Interglacial Greenland ice sheet evolution show that differences in parameter settings have a huge effect on how much the ice sheet melts (e.g. Robinson et al., 2011; Stone et al., 2013; Langebroek and Nisancioglu, 2016).
5) These studies validate their ice sheet model results to the present-day observed ice sheets. I think this is what you need to do as well. Compare your present-day or pre-industrial climate and ice sheet configuration to observations and discuss the differences. This will validate the model set-up, and increase confidence in your model results.
   How do you deal with the differences between the atmospheric and ice sheet model grids?
6) Also for Antarctica some discussion is lacking:

a. Lines 375-380: Can you show model "evidence" for the see-saw effect taking place in your model results? E.g. assess Atlantic meridional ocean circulation or heat transport. Do they really decrease?
b. Lines 381-390: What do you mean with "overshoot behaviour"? Is the Antarctic ice loss not related to the positive temperature anomaly? Which part is overshoot?
c. Also, how does the present-day/pre-industrial simulated Antarctic ice sheet look like? Is this not too sensitive to the temperature forcing, as is the case for Greenland? So in other words, no correction is needed for the temperature forcing over Antarctica?
d. Lines 391-402: these sensitivity experiments need more explanation, and a reference to Figure 9b.

7) The Section about freshwater input and thermal expansion of the ocean is very interesting, but also lacking information. How large is the freshwater input (Sv) and how long do the episodes take? Another figure or table would be useful.
8) Concerning the "double" peak in the Kopp reconstruction: Do you have suggestions why your model results do not reproduce this? Is it because of too constant the climate forcing, too slow regrowth of the ice sheets, or other missing feedbacks? Please discuss.

SPECIFIC AND TECHNICAL COMMENTS

1) Greenland and Antarctic ice sheets are abbreviated in line 59, please use these abbreviations in the remainder of the text
2) A bit more information on the coupling procedure is necessary (Section 4.2). How often do they interact or are the components updated, every day/year/1000 years?
3) Lines 275-293: You can also use the reconstructed limits for the Last Interglacial surface elevation change at the ice core locations compared to PI (e.g. NGRIP-members, 2004, Johnsen and Vinther, 2007, NEEM community members, 2013) to evaluate your model results.
4) Lines 294-305: I don't understand the need of such a speculative section. What is the surface mass balance evolution over the Greenland ice sheet? The resulting ice volume changes are shown in Fig. 4.
5) Lines 325-346: This section is difficult to read. It would be better to better explain the sensitivity experiments. Is "forced" the same a "stand-alone" as you call it earlier in the text? Better also to discuss the simulated maximum sea-level contribution in two steps: 1) effect of temperature scaling factor on resulting ice volume changes, 2) effect of coupling ("forced/stand-one" vs "coupled") on ice volume change.
6) Lines 360-365: comparing the Last Interglacial accumulation to pre-industrial is a bit difficult if you base the calculation on differently sized areas. Maybe the accumulation actually didn't increase in many locations? What happens over NEEM? Maps for certain time slices would be much more helpful.

Line 24: “reference experiment”, either describe the reference experiment, or omit the mentioning of this and change the values to express the full range of your results (0.62-2.77m)

Lines 32-33: would be nice to add which part of the ~5m is due melting of the Greenland and which due to the Antarctic ice sheet

Line 63: skip “e.g.”

Line 71: “mean” instead of “central”

Line 77: add “possibly” caused by

Lines 84-86: make new section, and add “evidence” for possible reduction of the LIG AIS

Line 87: better constrained than …? (I assume AIS evolution)

Line 102: also mention latest work (Langebroek and Nisancioglu, 2016)

Line 99: correct reference is Born and Nisancioglu, 2012; please also update in rest of text

Line 104: incorrect reference, maybe you meant regional climate model, or a different reference

Line 106: reformulate “results” – what results?

Line 108: check correct reference in reference list for Pollard and DeConto, 2009 or 2015?

Lines 113-114: skip “high-resolution”, grid boxes of 10 or 20 km is normal, not high for ice sheet models

Line 121: EMIC description with capital letters or not – make consistent with abstract

Lines 123-124: “The model has been utilised …” – but without dynamic ice sheets, and two-way coupling, right? Rewrite to make clear.

Lines 133-134: what is the resolution of T21 in degrees or km, approximately? “high-resolution ice sheet models”, see earlier comment

Lines 137-138: are the freshwater fluxes etc the same as in the earlier version of the model, or is the set-up the same? Please rewrite.

Section 3.1: Would make more sense to make Section 3.1 a part of 3.2

Line 157: change to “sea-level equivalents (SLE)”

Lines 158-160: sentence very unclear, please rewrite

Lines 181-183: Is insolation calculated for each latitude and for each month? Not entirely clear, especially because figure only shows 2 months and 2 latitudes.

Line 186: change “the latter” to “this data”
Would be nice to explain what this reconstruction is based on.

Line 193: Skip “As a measure”

Line 208: skip “comparison between”

Line 209: skip “recorded”

Lines 208-210: The ice sheet response to what?

Line 211: Are these “Additional experiments” stand-alone experiments or coupled?

Lines 217-219: What is the climate forcing for this initialisation? And how large are the ‘initial’ Greenland and Antarctic ice sheets, so at 135ka?

Line 231: The first section of the Result should be named “5.1 Climate evolution” or something similar

Lines 231-235: and what are the differences to Loutre et al., 2014?

Line 249: Southern Ocean (SO**)**

Lines 250-251: I don’t see this cooling event in the one-way experiment, please rewrite.

Line 254: change to “mass balance dominated by ablation”

Section 5.1: What do you call “ablation”? runoff + calving or only runoff? Need for some definitions here.

Lines 254-255: “Marginal” could mean “just a bit” or “on the rim”, please clarify.

Section 5.1: “Temperatures”, are these summer mean or annual mean? Surface or air temperatures? Please be more precise.

Figure 4: are the dashed lines the pre-industrial values? Would be great to have these numbers also for the ice area and volume.

Line 268: change “furthest” to “maximum”

Line 269: change “Conversely” to “At the same time”

Line 317: Not sure if Merz et al., 2014 is the correct reference here, as they focus on the effect of topography on precipitation during the Last Interglacial.

Line 334: “Figure 6, left” should be “Figure 6a”, check also rest of section.

Line 340: skip “therefore”

Line 365, “Figure 7**b**”

Line 367: so ablation is runoff?

Figure 7: what is the present-day ice area and volume in your model set-up?

Line 375: include reference to Figure 7d

Line 414: “included” instead of “attempted”

Line 428: “Ocean expansion is **rapid** during …”

Line 439: skip “well”

Lines 439-440: the estimated LIG ocean thermal expansion is 0.4±0.3m according to the IPCC report, they use McKay et al., 2011 as a reference. Please rewrite.

Line 443: “AIS **and** thermal expansion”

Lines 443-445: add reference to Figure 10

Figure 10: add information on confidence levels to figure caption

Line 453: change “hiatus” to “regrowth” or similar

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