Climate of the Past Discussions

Clim. Past Discuss., referee comment RC2
https://doi.org/10.5194/cp-2021-118-RC2, 2021

Review of cp-2021-118

Alexander Robinson (Referee)

Referee comment on "Dynamic boreal summer atmospheric circulation response as negative feedback to Greenland melt during the MIS-11 interglacial" by Brian R. Crow et al., Clim. Past Discuss., https://doi.org/10.5194/cp-2021-118-RC2, 2021

This study explores the transient changes in climate throughout MIS-11c, an important and unusually long interglacial period. The authors employ an earlier version of CESM with fully coupled components, except for land ice, to run time slice simulations at different intervals during MIS-11c. Changes in atmopheric patterns are investigated, particularly the North Atlantic region, in particular to understand potential impacts on the evolution of the Greenland ice sheet. This is very nice work that is well written and easy to follow. The authors present convincing arguments for the phenomena presented, such as the changes in precipitation patterns over Greenland as related to the jet stream. Overall, I find no major flaws and believe it could be published after minor revisions.

A key weakness of the study is that the Greenland ice sheet is prescribed to its present day configuration. However, this seems necessary and reasonable for the authors to be able to explore the phenomena of interest. Furthermore, this weakness is addressed well in the text. Nonetheless, I think there is an excellent opportunity to compare the quasi-time-series presented in Fig. 1 (JJA Greenland temps) with those of Robinson et al. (2017). There, peak summer warming around Greenland was estimated to be around 2-3degC, which is quite consistent with that presented here - obtained only by running a climate model with the right orbital configuration and GHGs. Making this comparison would add some value to the work here, and provide context for the promised future work with an interactive ice sheet component.

Some further minor points are listed below:

L79: Seems strange to have this posed as a question here. Perhaps rephrase into a sentence, or prepare the reader that you will ask a question.

L285: of Hadley cell => of the Hadley cell

L286: for the tropical convection upon => for tropical convection on

References

Robinson, A., Alvarez-Solas, J., Calov, R. et al. MIS-11 duration key to disappearance of the Greenland ice sheet. Nat Commun 8, 16008 (2017).