Warning: because of my very limited number for working hours these past weeks/months, I only focused on the answers to my comments and to the associated text. I apologize I haven't taken time to re-read the full article, despite my great interest for this work.

First I want to thank the authors for carefully considering all my comments and suggestion, it is much appreciated.

I recommend this article for publication in TC. I have a few minor suggestions, and 2 more important comments, listed bellow :

*** To the first point, EOFs map the spatial pattern of a variable associated with the highest temporal variance of another variable;**

Are you sure that is true? From https://www.sciencedirect.com/topics/earth-and-planetary-sciences/empirical-orthogonal-function-analysis : « EOFs of a space-time physical process can represent mutually orthogonal space patterns where the data variance is concentrated, with the first pattern being responsible for the largest part of the variance, the second for the largest part of the remaining variance, and so on. »

It seems that EOF maps spatial patterns associated with total (space-time) variance.

*** in this case, we map the spatial pattern of sea level pressure associated to the highest variability in SMB integrated over the AIS. To the second point, the typo will be corrected.**

Is there a typo? Is it spatial pattern of SMB instead of spatial pattern of sea level pressure ?

* Because CMIP6 uses a different future forcing scenario mechanism (Shared Socioeconomic Pathways), CMIP5 and CMIP6 future projections are not directly comparable.

Major: SSPs were designed to be comparable to CMIP5 RCPs, with indicated RCP in the SSPs: see Fig.2 of https://www.geosci-model-dev.net/9/3461/2016/gmd-9-3461-2016.pdf. Comparison between CMIP5 and CMIP6 is fully included in the next IPCC report.

So you should include CMIP6 in your improved projections.

***** the top 90th percentile overall scoring models were determined to be GISS E2 H CC, GISS E2 R CC, GISS E2 R, MPI ESM LR, MPI ESM MR, and MPI ESM P

Major: It's not unexpected that from the 6 « best » models, there are 2 clusters of same modeling center simulations : 3 GISS-E2 and 3 MPI-ESM. I think you must add a criteria in your model selection to select models from different modeling centers, because these models will share the same biaises (see e.g. https://www.pnas.org/content/115/38/9462). I think it is important to sample a diversity in model simulations. Can you remove 2 GISS and 2 MPI and add 2 to 4 other models instead ?

If you don't, you should add a table with all models ranked by the final score and including the score for each criteria and modeled SMB projection for each scenario; ~similarly to what you did in Supplementary but including all criteria scores and projections.

NB: it seems that Tables in Supplementary materials are not correctly displayed.

***** These eight models have been added in retroactively to figures 2-3

I don't see added models in Fig. 2? Maybe it's Fig. 3 and Fig. 4?

***** The reconstructed AIS SMB averaged from 1801-2000 shows Along with higher SMB valuesaround the coastal areas, particularly in the Antarctic Peninsula and West Antarctic regions (Fig. 2A). The highest absolute SMB trends are around the , the coastal regions of East Antarctica and the Antarctic Peninsula also show the highest absolute SMB trends (Fig. 2B). **This** reconstruction also highlights large portions of …

You have to introduce the reconstruction in the modified sentence.