

Dear Harry,

Thank you for your comments. We have applied the spelling, comma, grammatical and rewording suggestions to our updated manuscript.

For the comments that needed a bit more clarification I have added our comments here:

**White Glacier, outlet or neighbouring?**

White Glacier is a neighbouring glacier and not an outlet glacier. See here:



**Millan et al. 2022:**

Thank you for pointing out this study. We have added a sentence here and there referring to Millan et al. We have also inspected the Millan et al ice thickness with respect to the OIB flight line, which we also mention in the discussion. The only difference between the methodology of Millan and Zorzut is that Millan uses existing ice thickness measurements (when available) to estimate the rate factor,  $A$ .

**OIB flight line:**

Only two flightlines covers the ice cap top, one from 2014 and the one that we use from 2017. Those two flightlines are practically identical, which is why we have chosen only to use one of them --> the newest.

**Difference in HIRHAM5 periods:**

This is simply because this was the data we had available from DMI.

**Is the coarser resolution for PISM really needed?**

Yes! The integration time depends on the maximum time step allowed, which can vary a lot from ice cap to ice cap and parameter choices. For some parameter choices the 10 iterations took several weeks on 8 cores.

**The value of A:**

The typical value of the rate factor used in both Zorzut and Millan is  $2.4 \cdot 10^{-24}$  corresponding to a temperature of 0 C. When we use that rate factor for MIC we end up with  $f_a = 0.001 \rightarrow$  practically 0, which means that the ice is too soft. This also implies a worse misfit. For reference the mean temperature on MIC is roughly between -20 C and -30 C, mostly depending on the elevation. This is why we have chosen a different rate factor. The important thing is that  $f_a$  does not end up in either end of the spectrum [0,1].

**Moving things from results to methodology:**

We have followed your suggestion and moved the marked sentences to the methods section.

**PISM results and focus area:**

We have added a sentence when presenting Fig. 2 to clarify why we focus on the area that we do.

Kind regards,

Aslak and Ann-Sofie