

Dear Editor,

We sincerely thank for the helpful comments and for reviewing the manuscript. The comments were very valuable and helpful for improving the manuscript and for making it clearer.

The points not written here have been corrected as suggested.

Editor Comments

Additional comment for section 4.1

In section 4.1, you elaborately identify the glacial termination to which the ice belongs by combining various techniques. This is a great interdisciplinary approach, but in some sense, it may also be a bit of an ‘overkill’. What do I mean by this? From a theoretical ice flow perspective, you would expect the blue ice that is directly located next to the snow (downstream of it) to be very young: i.e. from the present interglacial. To illustrate this, I attached a (rough) sketch of a transect along the flowline of an ice sheet that I once made. It is not a great illustration, but I hope it helps in explaining the concept I am trying to explain here. For another illustration that explains illustrates this concept, you can also refer to Fig.1 in doi.org/10.1126/sciadv.abj8138

In other words: if I would not have seen any of the analyses presented in your manuscript and you would have told me there is a Termination in the BIA and asked me which one it is, I would have answered with relatively high confidence that this must be Termination I. There can be exception to this if there is complex ice flow upstream, with several blue ice areas being crossed etc, but even then, you would rather expect discontinuities in the blue ice area profile further downstream, rather than having ‘old ice’ (from an interglacial period that is not the last one) just downstream of the snow-blue ice area transition.

At this stage I am not suggesting that section 4.1 should be strongly revised, but I think that including an explanation that follows what is described above in this section would be an added value. To be more specific, you could for instance explain in a few sentences that you expect ice to be relatively young from an ice flow perspective (as the blue ice area seems to be located directly downstream of an accumulation area). Moreover, having an additional more ‘glaciological’ interpretation to your section would further justify the publication of this study in *The Cryosphere* (compared to e.g. other more palaeo-focused journals, such as *Climate of the Past*).

Thanks a lot for taking this comment into account when revising your manuscript!

- **Line 384: We included an explanation that we expect relatively young ices from Larsen BIA. The new relevant text is as follows:**
 - Based on satellite image of the studied area, Larsen BIA might have been located directly downstream of an accumulation zone and the ice might have been originated solely from an accumulation zone because no other BIAs are identified upstream (refer to Fig. 1 in Zekollari et al., 2019). This expectation is supported by the GPR survey profile (Fig. 3b, c) and the $\delta^{18}\text{O}_{\text{atm}}$ (Fig. 4a), which indicates no complex ice stratigraphy and no discontinuities in the downstream area of Larsen BIA, respectively. In terms of this ice flow condition, we expect the age of Larsen BIA corresponds to relatively young one among the latest glacial terminations.

Line 24: Sampled from the surface (horizontal ice core)

- Line 25: Discrete ice samples were collected. Not a horizontal ice core.

Line 26: climatic interpretation is complicated by the need for upstream flow corrections, evidence for strong surface sublimation during the last ice age, and potential errors in the estimated gas age-ice age difference.

- Line 28: This sentence is moved to “Line 31”.

Line 77: Depends on age of the ice, right? If so, would probably omit.

- Line 88: According to Bender et al. (2008), the age uncertainty would be ± 180 ka or 11% of the age, whichever is greater. So we think it is necessary to include this in the text.

Line 88: For dating ice ages, glaciochemical records...

- Line 100: The sentence is moved to “Line 113”.

Line 158: Suggest including this information in section 2.1, rather than here

- Line 178: The sentence is moved to “Line 150”.

Line 281: and >2200 m?

- Line 302: Ice layers at a distance of > 2200 m are identified at Fig. 3c. The new relevant text is as follows:
 - Ice layers at a distance of $> 2,500$ m have a relatively flat dip.

Line 377: Unclear and does not seem to be consistent. What are the upper limits? What about the lower limits? The errors for the 81Kr age are not only due to atom counting, right?

- Line 412: We added which column we were referring to.

Line 387: These are not results from your study here. You use them to compare. Probably better to have these in suppl. mat. Could potentially even consider having some of the figures you have now in suppl mat, but which are quite crucial to your story, in the main text (such as A1)

- Line 423: We moved the figure to “Appendix C”.