We would like to thank the second referee for their review and address their comments in blue as follows:

While there is no doubt that it does not represent an issue at Skytrain ice rise during the Holocene or during interglacials, the authors should comment on what they expect to happen at this site during glacial periods, when the acc. rate is much lower.

It's a valid concern, the first reviewer made a similar suggestion, and it should definitely be addressed. Indeed, the accumulation rate at many Antarctic drilling sites was about half of its present value in previous glacial times. Counter-intuitively, however, glacial conditions are more favourable towards chlorine preservation, as higher atmospheric concentrations of alkaline dust neutralised acidic species (HNO3, H2SO4, HCl). At low accumulation sites, like EPICA Dome C, both sea-salt chlorine and 36Cl were preserved, as we have explored in a previous publication (Quat Science Reviews, https://doi.org/10.1016/j.quascirev.2025.109254). We will include this information in the introduction to emphasise that only the present-day accumulation rate has an influence on preservation and that chlorine is generally preserved under glacial conditions.

It's a good result that the 5 ages estimated in deep ice (figure 3) are getting older as depth increases but the discussion about the inconsistency of the first two points should be more detailed and the addition of the other experimental points (the younger ones) to this graph would greatly help in making clear how the estimated ages in the younger part relate to the official chronology.

We agree that it would be useful to include also the estimated ages for the younger samples and compare them with the established chronology to provide an overview of the scatter in age estimates and to highlight that the method is only suited for older samples. Plotting all calculated ages in the original Figure shows that the estimated age is actually in agreement with the established chronology for all but two samples. Additionally, looking at the age discrepancy between the radionuclide age and the chronology, all but this one sample are also within 100 kyr of the actual age. While transparently emphasising the uncertainty of the method, the addition of this data to the Figure also provides additional confidence in its validity in our opinion, so we are happy to include it. It also puts the comparably young age of the first two samples beyond the chronology into perspective, which, in reality, are probably about 130 kyr old.

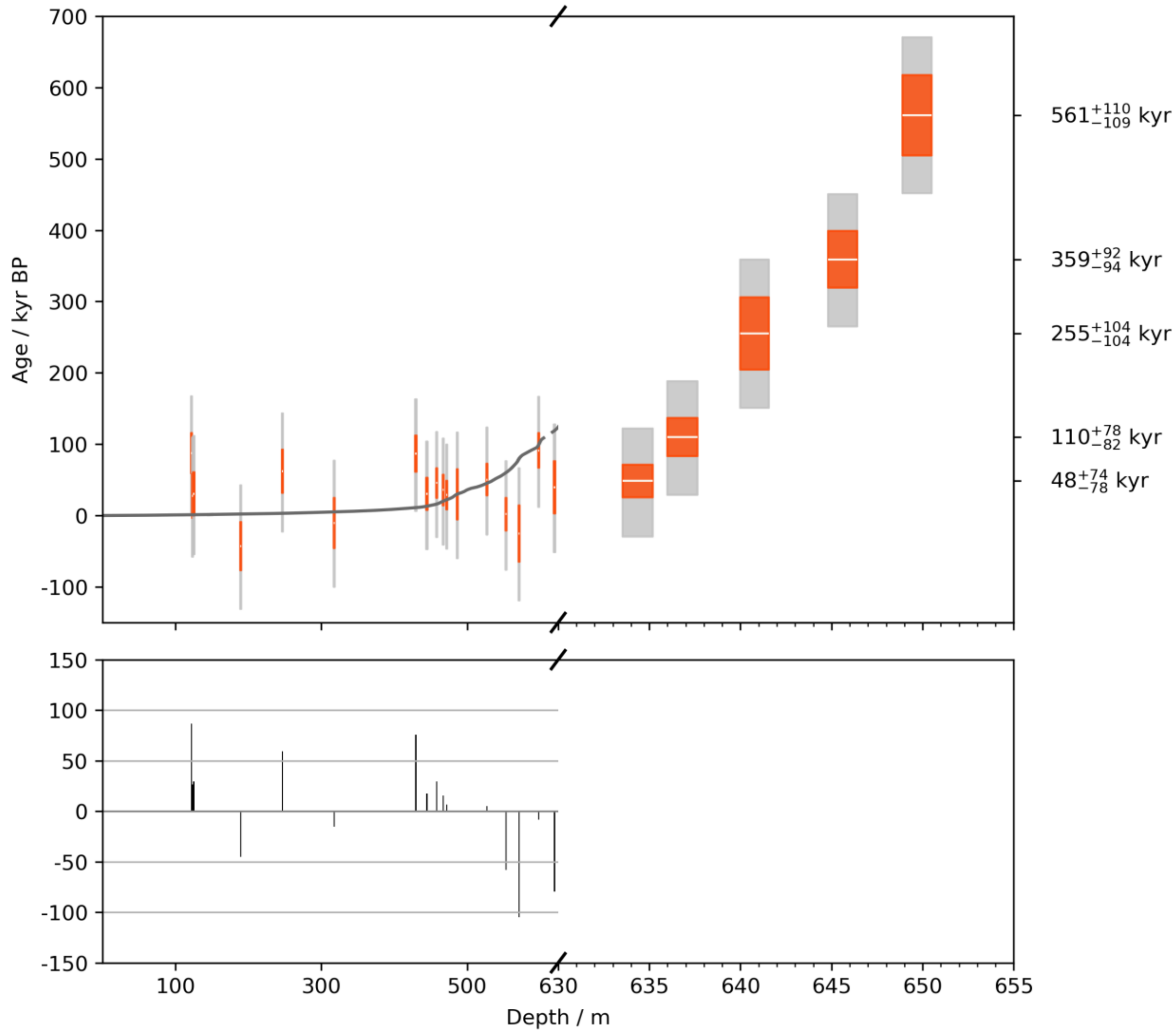

Figure 1: Estimated ages for all samples and deviation from the ST22 chronology for samples below 630 m depth.

A short discussion about the influence of possible artifacts in the bottom ice seems to me very useful. Since 36Cl and 10Be have a different behaviour as concerning their movements in the ice, while the diffusion of H36Cl is properly discussed in the text, the possibility of an accumulation at grain boundaries of 10Be and 36Cl in the deep section should be briefly taken into account. If some information about the physical properties of the ice are available (crystal dimansions, etc), this should be mentioned in the paper to corroborate the meaning of the 36Cl/10Be ratio.

About possible migration of 10Be, we write in the original script: "Despite the comparably short length and young bottom age of the Skytrain ice core, 10Be may have migrated towards grain boundaries outside of the core, a process which is enabled through acidic liquid phases at grain boundaries and triple junctions (deAngelis et al. 2013, Fukazawa et al. 1998, Sakurai et al. 2017, Mulvaney et al. 1988}. Similar behaviour has been postulated for the EDC, EDML, and GRIP ice cores (Kappelt et al. 2025, Raisbeck et al. 2006, Auer et al. 2009, Baumgartner et al. 1997}. Alternatively or additionally, recrystallisation may have resulted in new Be compounds which are not dissolved by our standard extraction method (Baccolo et al. 2021). If this is the case, all five ages would likely be underestimated.”

We will add that no melting, which would favour migration, occurs at the bottom, as the bed temperature is -15 degrees (Table 1 of Mulvaney et al. 2021). Further research is needed to understand what happens to 10Be in deep ice, while there is no indication of migration or remineralisation for 36Cl. Even for 10Be there are only indicators, such as the older ages obtained with 36Cl alone and the shift from age overestimations to underestimations around a depth of 500 m with the ratio.

Line 77: are all the significant figures in 0.299 mg necessary?

We added Be and Cl carrier with the precision of three significant figures. While it is way within uncertainty, we prefer to report the carrier amount to the precision we aimed to achieve in this step.

Line 112: change to “... signal from Mulvaney et al. (2023)”

Thank you, we changed it.

Line 149: the numbers in the equation are slightly different from those in fig. 2c.

We will adapt the correct numbers of Fig 2(c) here.