This is an interesting work about ice thickness data collected by a helicopter borne radar system used to survey some of the biggest Southern Patagonia Icefield (SPI) eastern freshwater calving glaciers. The area is contributing to sea level rise at high rates, therefore, knowing the total volume of ice storage there is very important. Several subglacial topography models have been published in recent years, however, validation data based upon in situ surveys are lacking. This manuscript is providing a great data set that will certainly improve our estimations of the total ice thickness in the area. This data set will be useful for several kind of studies and the effort and high costs of producing the data is highly appreciated.

In spite of the above very positive first impression, I have the feeling that some issues in the manuscript must be addressed in order to improve the presentation of the results. A great effort was put on describing the method and uncertainties, but I'm missing more discussions about the data, for example, not only describing where they got nice bottom reflections, but also, where the data are a bit obscure or noisy. Why these problems? We know that water is precluding good penetration ranges using radar, but at Perito Moreno they got useful data almost everywhere, even if previous works (https://www.nature.com/articles/ngeo1218) are showing a water table within the lower glacier tongue. Apart from water, there are more issues; Internal structures? Surface debris? Ash bands? I'm encouraging the authors to use the opportunity to discuss a bit more about the technique, the results and the limitations.

Also, I think the figures including maps must follow typical cartographic frameworks, especially with North to the top of every map.

In spite of these comments, I think the manuscript deserves to be published after addressing these points.

Below some more specific comments. I hope these will help to improve the manuscript.

Abstract:

Check the use of "." for thousands and not for decimals or vice versa. Check all along the manuscript

Line 40-43

This is a regional study (eastern side of the SPI) not including glaciers advancing or having at present positive mass balances (Perito Moreno has been considered a glacier in equilibrium, but looks like in recent years this is changing). However, within the SPI there other "advancing glaciers like Pio XI that are not discussed or at least mentioned. The projections for these glaciers are not validated neither calibrated, therefore there are very high uncertainties in rpojections, and not only related to frontal ablation as stated. I suggest adding a paragraph about uncertainties related to future surface mass balance and also mentioning "anomalous" glaciers. This will give to the reader a most balanced and wider understanding of the complex glacier processes taking place in the region.

Line 56

There are also some on the ground surveys worth mentioning, like Rivera & Casassa 2002 https://doi.org/10.1007/978-1-4615-0645-4_10

Regarding Figures (1, 5a, 5c, 6a, 6b, 7a, 7c, 8a, 8c, 9a, 9c, and Supplementary figure 1a and Supplementary 2c)

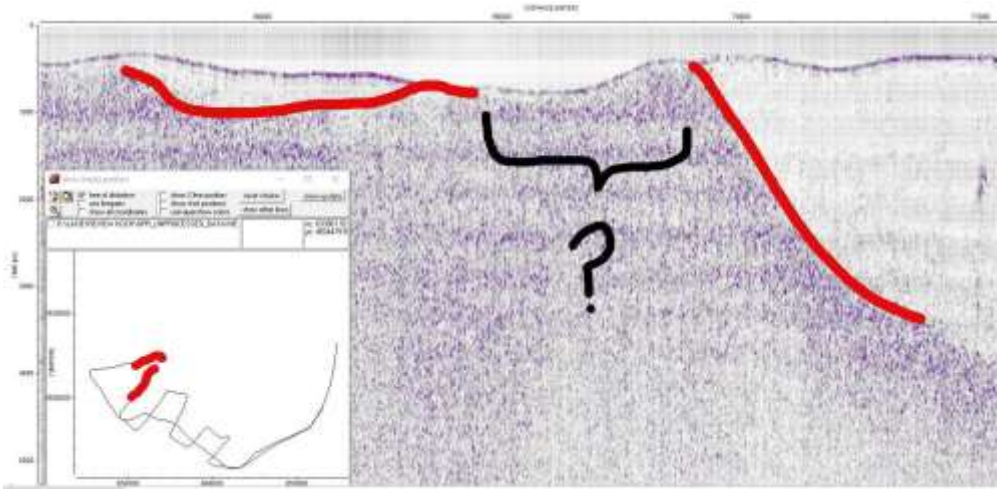
I strongly recommend to rotate all the above mentioned figures in order to show the North up. Cartographically, North is normally to the upper part of the figures been this way easy for any reader. The listed figures are rotated (maybe) for a better use of the journal space, but this

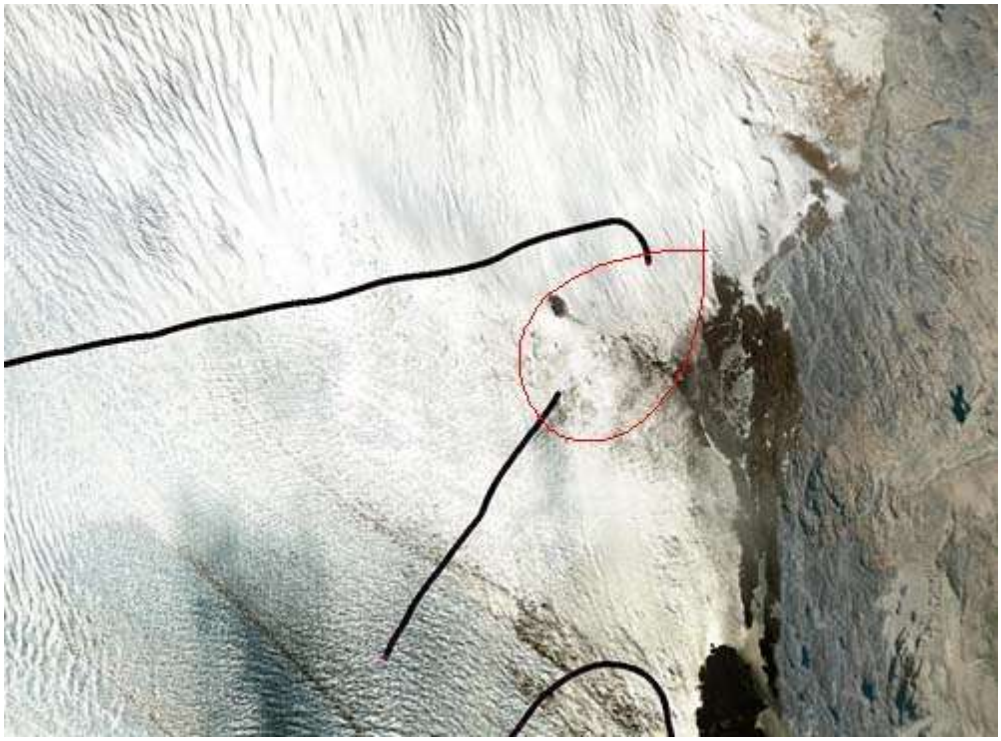
rotation is adding in my point of view, complexities to the maps, since commonly we see North Up like in Upsala figure's. Better to have all figures with the same direction/orientation.

Line 148

I was wondering if horizontality is always obtained, especially when the helicopter is turning along the track (near the edges of a glacier for instance). I repeated the analysis of all the radargrams using Reflex, and I found some profiles where looks like the antenna was tilted (not sure of course) or the interpretation could be not clear due to this and other factors (debris, water, etc).

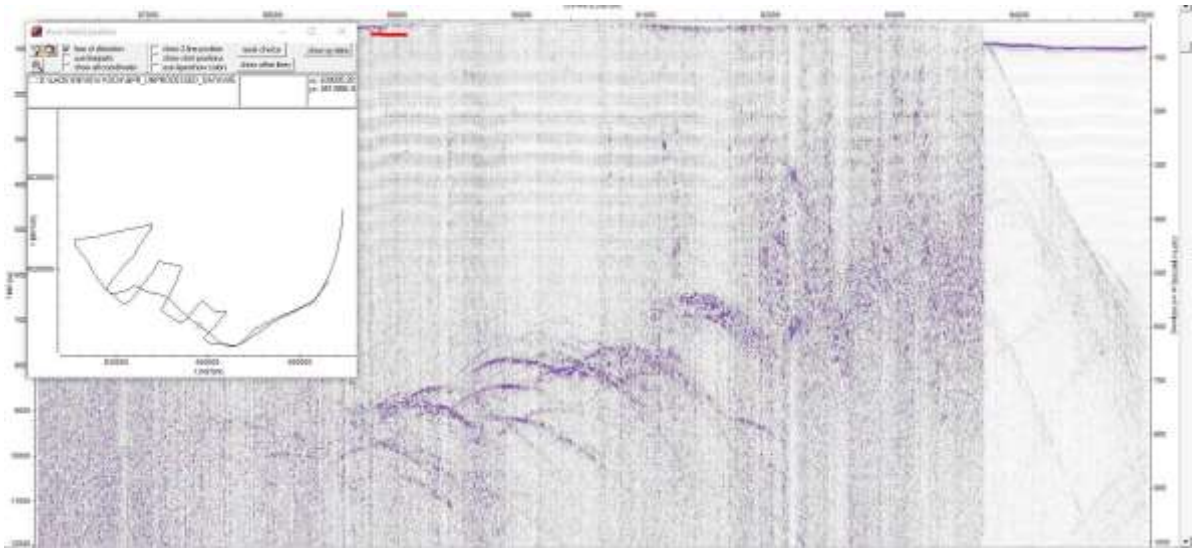
For example, in the following profile obtained at Viedma, around the turn of the track, the bottom is visible as a red line (see the location below where the points with ice thickness data are shown on top of a satellite image), but then, at the center of the figure the signal is missing in spite of been above. After few meters to the right and left, the bottom is clear again in the radargram, but in between something happened that the bottom is missing. Is this obscure return due to the angle of the antenna during the turn? Or is the partially debris covered surface? A moraine? Many possibilities; I think is worth discussing this kind of problems in the data. The clear part of profiles look great (like the right side of this radargram), but it is also very useful to discuss more obscure data.

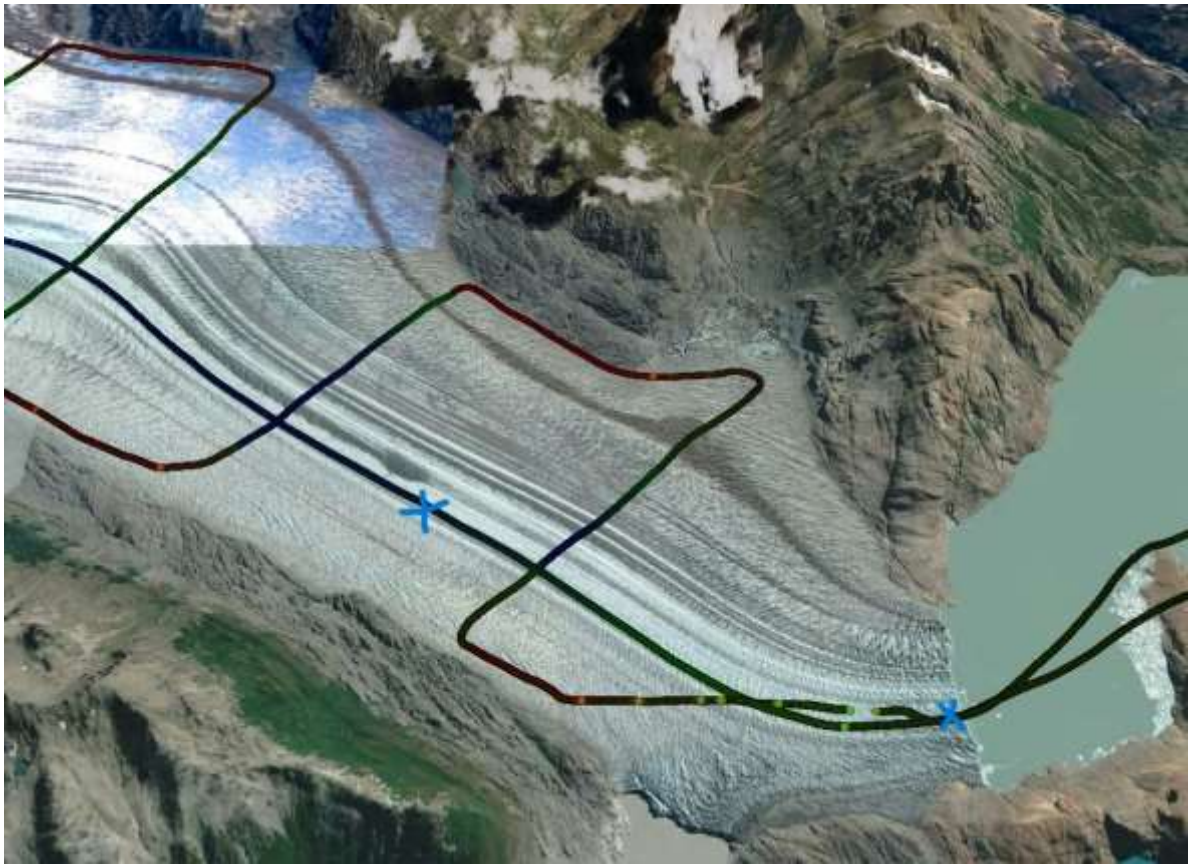




In general I agree with the interpretations of the bottom reflections. The data are very nice all over the glaciers. In few cases I think the interpretation is too conservative, and in few others is probably too overoptimistic, but in general I think the data is extremely useful and well collected and interpreted.

There are few intriguing cases. For example, in the following track there are no interpreted ice thicknesses along the profile until the lake, but the radargram is full of hyperbolas (around 700m depth) that partially could be related to the bottom or more likely to lateral reflections, however, at this location, the lateral rock walls are more than 1000 m away the track. In this case, I did not apply migration to the data, that probably helped dismissing the bottom as was finally decided, but the presence of these hyperbolas are indicating something that could be interested (water conduits? moraine material?) This kind of features are worth been discussed in more detail. The same could be said for the near lake record that looks much noisy or obscure, probably due to water and crevasses. I think the discussion of these dasta could be expanded a bit. This will help readers to better appreciate this nice data set.





Line 154

Maybe you can say more about Blindow et al, 2012 since it was related to Nef and Colonia glaciers also in Patagonia.

Figure 3 and 4

Please confirm that left side of (3a) is also the left side of the red profile in (b) and (c).

In order to avoid any misunderstanding about the left and right side of the profiles, it could be better to have A-A' in (a) (b) and (c)?

Line 213.

In similar works related to radar data, the thicknesses at crossing tracks are compared in order to estimate uncertainties. Did you compare ice thicknesses at crossing points? There are several tracks crossing each other, and I think the differences on these points can illustrate very clearly the potential errors.

Table 1:
Above sea level, meaning the elevation data is "geoidal"? Maybe is better to confirm that. Normally GPS data is based upon ellipsoidal reference.

Line 256

I suggest to include here the work done by Lannutti et al., 2024

https://doi.org/10.1016/j.coldregions.2024.104158. They reconstructed the bed topography of the same glaciers, including validation with available radar as well as bathymetric data

Line 266

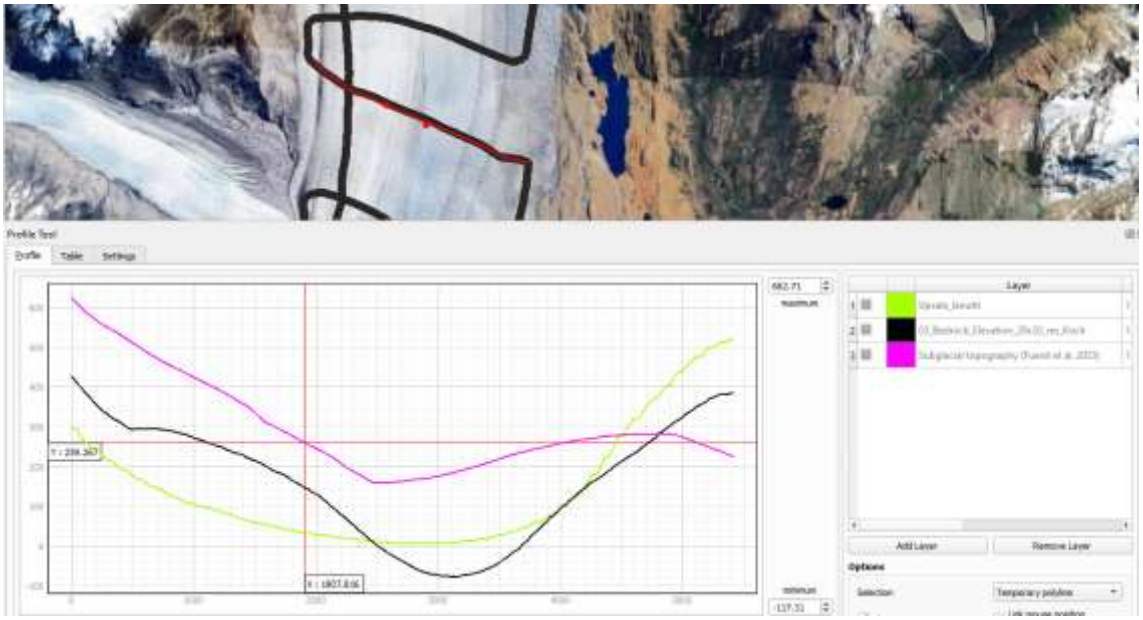
This analysis is important and I think it deserves more details. In Supple Figure 2 looks like there are two "data groups", one very dense data points and the second one, in parallel, with less data. Why? Are these two "families" related to different glaciers?

By the way, I think is better to keep Supplementary figure 2 (and not Appendix Fig. 2)

Line 296

"align well" is not very precise. In spite of some good numerical comparison described in this paragraph I suggest adding topographic profiles with the differences between available models and available data

The use of topographic profiles will help to better see the results and improvements. Below, I added a profile along a transversal track measured at Upsala (red line on the upper figure). Along the profile, pink is Fûrst et al, 2024. Black is Koch under review and green is Lanutti et al, 2024. There are some strong differences that deserve to be discussed and addressed in the manuscript.



Line 316

Rivera et al., 2022 detected 900 m near the Viedma 2022 glacier front. ¿Is this water depth consistent with your data? see: https://revistas.unlp.edu.ar/geoacta/article/view/14210

Line 342

"Consistent" is arguable, especially when there are bathymetric data closer to the glacier front indicating much deeper water depths (as said before, have a look to Rivera et al., 2022 : "Estudio de la profundidad del lago Viedma, Parque Nacional Los Glaciares, Argentina". GEOACTA 43(2), 4-6.)