

Referee 2 (anonymous)

This paper is a summary of an extensive geophysical survey field effort at the Central Andes of Chile and Argentina where the objective was to study ground ice content. The authors analyze an extensive set of geophysical surveys (53 geoelectrical and 24 refraction seismic profiles) ranging from high latitude locations ranging between 28 to 32 °S. The dataset covers different landforms including ice-poor bedrock to ice-rich rock glaciers and the authors analyze the thickness of ice layers at each survey location. In my opinion, the paper is suitable for publication in this journal. Here are some specific comments that could improve the quality of the manuscript.

REPLY: Thank you very much for your careful reading and the suggestions below, which we will address by point-by-point response in the following.

C1: Line 40: Maybe replace “key stores” with “main storage”

REPLY: agreed and changed accordingly

C2: Line 98: A closing parenthesis is missing.

REPLY: changed accordingly

C3: Line 138: Two “therefore”, consider changing wording of one if them.

REPLY: we rephrased the sentence accordingly

C4: Line 364: ZOI abbreviation has already been explained. I suggest just using “ZOI”. Same for PR and TS (Line 373).

REPLY: changed accordingly

C5: Line 368: space after “10a,”? Same comment for Line 377.

REPLY: changed accordingly

C6: Line 446-447. Is this sentence needed here? It seems misplaced and it is its own paragraph?! Consider “weaving in” somewhere else.

REPLY: We agree and combined it with the preceding paragraph as follows:

Therefore, we used ground truth data from the various field sites to validate the geophysical data. Table 3 gives an overview over the different types of available ground truthing data (boreholes, test pits, natural outcrops), the respective depth range covered, and the type of validation provided by the different data.

C7: Line 524: consider writing “the periglacial belt (see sections 4.2 and 4.3)” to replace “Examples are given in sections 4.2 and 4.3”.

REPLY: changed accordingly

C8: Table 1: CL and AR are not defined anywhere.

REPLY: We added the explanation of the abbreviation in the caption of the table (CL = Chile; AR = Argentina).

C9: Lines 563-565. D09 are mentioned twice and it seems like D09 is for non rock and rock glaciers (can it be both?). First it refers to D09 as “non-rock glaciers” and the second time mentioned it says “observed in rock glaciers (D09)”. Maybe there is a mistake in numbering?

REPLY: Thank you very much for spotting this. Yes, we agree that this is a bit misleading. We wanted to express, that the ground ice content of profile D09 is close to that of rock glaciers, but we will rephrase the sentence for clarity in the revised version.

C10: *Figure 1: The scale bars are really hard to see. I suggest that these are made in white or boxed in.*

REPLY: agreed and changed accordingly

C11: *Figure 2: Consider making lines thicker and/or in a different color (white?). They are really hard to see now. Also, the name of the lines are almost invisible. Is it possible to add an approximate scale bar? a, b, c and so forth are not mentioned in caption. Some of the text is really hard to read (i.e., text in b, d, g).*

REPLY: Thank you for this comment. We will increase the visibility of the lines in our revised version. However, as most profiles stretch over foreground and background parts of the photographs, a scale bar could not cover the different dimensions in a consistent way, and would be confusing in many cases. We therefore prefer not to do that. The length of the ERT profiles is indicated in Table 2, which may help the get a feeling for the dimension.

C12: *Figure 3: Should it be a) rather than A)? Figure 2 uses a) but most figures use A).*

REPLY: We will homogenise the type of letters for subplots in the figures.

C13: *Figure 5: It is mentioned in a "section of the ERT profile" but it isn't mentioned which section and this is true for all figures like this one. For example, I would have like to see, "section of the ERT profile covered by the RST profile (see $x = A$ m to $x = B$ m in Figure 3a doe full profile). Also, is the Ohmm scale different between Figure 5 and Figure 3? It seems like this is true for most of these comparisons.*

REPLY: We will indicate the position of the RST profile within the ERT profile for all these plots. We will also consider homogenising the colour scales.

C14: *Figure 8: Same comment as for Figure 5. It is unclear what section (distance) of the profile shown in Figure 7.*

REPLY: see reply to C13.

C15: *Figure 10: No c) in figure to the right.*

REPLY: will be added in the revised manuscript.

C16: *Figure 13: and here "a" and "b" are written "(A)" and "(B)". Consider staying consistent between figures.*

REPLY: see reply to C12

C17: *Figure 15: Consider labeling each line in the figure.*

REPLY: yes, we can do that.

C18: *Appendix: Table 1: Consider writing "Data quality overview of the" rather than "Overview about the data quality of the ".*

REPLY: agreed and changed accordingly

C19: *Figures A1 – A4: None of these captions start with a capital letter and there are no periods at the end of the captions.*

REPLY: agreed and changed accordingly

C20: *Figure A3 (Line 800): Add "Figure" before "A3". Should A4 be A3? Also, add "Figure before "A4" (or A3).*

REPLY: agreed and changed accordingly