

Dear Adrian Flores Orozco,

Thank you for your time reviewing our manuscript and the valuable detailed comments in the attached PDF. Please find our response below:

*Editors' comments: I was able to find many redundancies in your paper.*

Authors response: We have removed all the text suggested by the editor in the attached pdf.

*Editors' comments: I also believe that the structure of the paper could be improved. In particular, I think you should try to explain as much as possible your models and processes in the inversion and modeling of the data in the Material and Methods (M&M) sections. This would help to reduce the length of the Results section and present there a clear presentation of the outcome of your analysis. Also re-structuring your paper could help to the readers to clearly understand the details of your numerical modeling, and data handling. For instance, the entire sub-section on the estimation of attenuation rates using the Arrhenius-model could be moved to M&M and provide there all details.*

Authors response: We have re-structured the manuscript as suggested by the editor and moved the radar attenuation rate analysis section to the methods section.

*Editors' comments: In the attached PDF, I provide a few examples of sections that can be summarized, or re-structured, also a few lines that seem to be redundant. I encourage you to revise your manuscript and maybe re-structure it. Maybe it also helps to reduce its length.*

Authors response: We have revised the manuscript including all the edits and corrections suggested by the editor. We have also moved Figure 12 to the appendix to reduce the manuscript's length.

*Editor comment [in PDF]: it would be convenient to explain in material and methods, how you define the fluid conductivity and ice content for different types of water/temperature*

Authors response: Here, the acoustic properties of the brine at different temperatures have come directly from the results of an acoustic pulse transmission experiment conducted in Prasad and Dvorkin (2004). This is stated in the caption to Figure 4.

*Editors' comment [in PDF]: I believe that the issue of IP effects in EM data needs to be addressed within the discussion and to be mentioned as a further topic of research. It would be interesting to make the TEM data available for the community dealing with IP effects in frozen ground, as expected in TC.*

Authors response: The TEM data is openly available to the community at <https://doi.org/10.5281/zenodo.7641565> and we welcome any further studies using this dataset. This link is included in the Data availability section. During TEM processing we

did purchase a SPIA license and run some initial IP inversions, we found the SPIA resistivity inverted result to be very similar to the Bayesian inversion result. We report the Bayesian result in this manuscript as the code is open source and freely available online for the community to use. We do not believe the results from an IP inversion would change our interpretation. Furthermore, we are confident in our EM inversion results as they are consistent with the results from the MT inversions. A detailed IP inversion would enable an estimate of the chargeable material in the subglacial environment; however, we believe this is out of the scope of this manuscript. For these reasons and to avoid confusion to the reader, this paragraph has been removed from the manuscript.