Specific comments:

Structure:

From the introduction it is was not entirely clear to me, that the authors will be re-evaluating the radio echo sounding (RES) data and, therefore, section 4 comes a bit out of nowhere. However, I think that it is relevant and I believe it deserves to be named as an objective of this study directly in the introduction. Additionally, parts of the derivation of the Arrhenius modeled attenuation rates sub-section might be better suited to the methods section. If you follow this comment, I think it may be worth to briefly introduce the RES method, in particular for readers who are not familiar with the method and the previous studies.

Transient Electromagnetic Method (TEM):

In Line 143 you refer to Grombacher et al. (2021) for the induced polarization effect. Although, this study is relevant for airborne TEM data in permafrost environments, it is not at the core of induced polarization literature. Maybe you could elaborate a bit on the physical background of the induced polarization effect and a few earlier studies on the presence of the IP effect in TEM data. Please find here a few suggestions that you might find useful (in no particular order):

Weidelt, 1982; "Response characteristics of coincident loop transient electromagnetic systems"; 10.1190/1.1441393

Kozhevnikov and Antonov, 2012; "Fast-decaying inductively induced polarization in frozen ground: a synthesis of results and models"; 10.1016/j.jappgeo.2012.03.008

Kang and Oldenburg,, 2016; "On recovering distributed IP information from inductive source time domain electromagnetic data"; 10.1093/gji/ggw256

In the same sentence (Line 143) you state that you do not invert for IP effects, however you do not really justify this choice. Why did you refrain from inverting for the IP effects in TEM data? Could you maybe add the full raw data curve of your 7 soundings and mark possible negative voltage readings?

Magnetotelluric Method (MT):

In the TEM inversion you selected a range of 1e3 Ωm to 1e6 Ωm for the ice layer, yet in the MT you fixed the value for the ice layer at 1e5 Ωm. Why didn't you select the same constraints for the ice layer for MT and TEM?

Seismic reflection method:

In Line 192 you state that due to the positive polarity of the ice base interface and the second reflector, it is unlikely that the material beneath the ice is a lake. Is this only derived from the numerical example in Figure 3b, or do you have a physical explanation for this reasoning?

Materials below the DIC:

In sub-section 3.3. you describe the physical properties of the materials below the DIC, but as far as I understood, the acoustic impedance points to a high clay content of up to 40%, whereas the EM methods solve for an electrical resistivity between 1'000 Ωm and 10'000 Ωm, which contradicts the high clay content of 40% a bit. Could you please clarify this?

Conclusion:

In lines 448 – 450 you state that future studies should include a sensitivity analysis of the attenuation-rate. Maybe you could elaborate on this and provide some even more explicit guidelines for future studies to avoid the misinterpretation of a subglacial lake.

Technical corrections and suggestions:

Line 74: Active source seismic, TEM and MT data were all collected in the same field campaign

Line 154: I believe the serial numbers of the MT device are not relevant here. Please remove for the sake of conciseness, or justify why they are relevant.

What do you mean exactly by r.m.s (e.g., Line 283)? An absolute , relative or error weighted value for the misfit between modelled and measured data?

For ranges of values and units, I personally prefer to have units at both the lower and upper end of the range (e.g., Line 282). You are actually using the percentages in Line 281 for both values! Please use units for all values consistently throughout the paper.

Line 372: Equation 4 is cut-off at the end of the page.

Throughout the text of the manuscript you are using Ωm, but in a two Figures (5, 10) you are using Ohm.m, while you are using **Ω.m** is the captions. Could you please use Ωm consistently throughout the paper?