Thank you for the constructive feedback on our manuscript *EGUSPHERE-2026-1357*. We have addressed all comments. Below is our point-by-point response detailing the major revisions made followed by responses to the reviewer comments.

General Changes Made

- Grammatical, spelling, formatting errors, and redundancy were addressed.
- We have tidied up figures 4-9 to ensure subplot and axis labels are correct. Figure 5 and 8 legends were added and further description was included in the main text where highlighted in the annotated PDF.
- Emphasis on applications beyond snow and ice has been limited to the conclusions.

Section 1 - Introduction

- More references have been added to GPR/EM studies.
- Content emphasizing general usage of SeidarT beyond snow and ice has been removed.

Section 2 - Architecture

- Workflow chart has better contrasting text

Section 3 - Background

- More context was added on the EM attenuation
- Clarification on permittivity and other relative terms have been added.
- Figure 2 has been removed. Other referencing comments have been addressed.
- Staircasing effects have been discussed in the Stability Conditions
- Computational Performance section was added with flop counts, runtime benchmarks, and computing context

Section 4 - Example Models

- We have added more description and background to the ZOP survey. The original field experiment details have been added.
- There is justification and clarification on Table 1 in the main text. This table refers to two layered models used for the seismic body-wave and surface-wave examples. The layer velocities were chosen and tuned to provide clear separation of the phases and to deliberately excite mode conversions. In realistic snow and ice settings, diving waves, low impedance contrasts, and weak Rayleigh modes make these phases more difficult to isolate and visualize.
- In Figure 9 we used an AIC-based autopicker to identify phase arrivals and noted that both compressional and shear-wave energy propagation are observed. To clarify this, we have added a 3 component time series of the seismograms, together with the corresponding polarization analysis, to illustrate the picked phases. We also included the mathematical formulation of the AIC picker and the polarization transformation.

Reviewer Comment: In the Introduction, SeidarT is presented as a forward model capable of handling anisotropy in any environment in which seismic/GPR data are collected. Upon reading the rest of the manuscript, many parameters and governing equations are tuned only to the application in snow/ice settings. The Introduction should be tailored to applications in snow/ice environments and not more generally to ensure capabilities are not "over-promised". While it is acknowledged that such a model could be extended to other applications, the model is not parameterized for such applications, and the manuscript does not present enough case studies for broader applications. Rather than targeting these broader applications, it is suggested that authors simply make this note in the Summary/Conclusions that future work could be done to examine these applications in other fields.

Response: We have revised the Introduction (Section 1) to narrow the scope specifically to snow and ice environments, avoiding over-promising broader capabilities. As suggested, we relocated discussion regarding the general extension of SeidarT to other geological and engineered settings to the Conclusions section as potential future work.

Reviewer Comment: Within the governing equations section, further parallels between the seismic and GPR methods could be touched on. Specifically, the attenuation of the EM wave and seismic wave could use additional explanation as to the same amplitude decay governing the propagation in the subsurface. Clarification on the use of the term "permittivity" should also be considered in the GPR section for reader understanding of either the "relative dielectric permittivity" or the "relative permittivity".

Response: We expanded the Background (Section 3.1) to detail the physical parallels between seismic and electromagnetic (EM) wave attenuation, explicitly outlining the governing amplitude decay formulation. Additionally, we clarified terminology throughout the GPR section by replacing ambiguous mentions of "permittivity" with "relative dielectric permittivity".

Reviewer Comment: The manuscript contains numerous citation errors, typos, unreferenced figures, and incomplete sentences that hinder readability. The manuscript is currently unbalanced. While the computational framework is described at length, the Validation section is disproportionately brief. An in-depth description of the numerical models and a more robust discussion of results versus theoretical expectations are necessary.

Response: Thank you for this feedback. We have thoroughly proofread and corrected the manuscript for typos, grammar, missing citations, and figure callouts. To balance the manuscript, we significantly expanded the Validation section. Specifically, we added detailed model parameterizations and an extended comparison between our numerical results and theoretical expectations.

Reviewer Comment: Figures lack subplot labels, which makes description provided in the main text of the manuscript hard to follow. Some figures seem to be unfinished due to the lack of axis labels, legends etc. Several figures are not sufficiently described or interpreted within the main body of the text.

Response: We have updated all figures across the manuscript to include clear subplot labels (e.g., a, b, c), missing axis labels, and complete legends. Corresponding text callouts and figure descriptions throughout have been updated to explicitly reference these subplot labels and offer fuller interpretations of the visual results.

Reviewer Comment: The settings for the synthetic experiments are not sufficiently detailed. These should be supported by graphical illustrations of the experimental design (e.g., layer geometry and source/receiver configurations). Information regarding model parameters is not always provided with the required detail or scattered throughout the text. This should be consolidated at the beginning of the relevant sections. The authors should explicitly describe the expected physical outcomes of their experiments rather than assuming the reader is familiar with the underlying theoretical considerations or cited literature.

Response: We have consolidated parameter descriptions at the beginning of each respective synthetic experiment subsection and explicitly added explanations of expected physical outcomes. Regarding schematic illustrations: because most of our synthetic setups consist of simple, single-medium, single-layer domains, we found that adding graphical schematics provided redundant visual information without adding clarity. We have instead expanded the textual descriptions to thoroughly document source/receiver geometries and velocity/permittivity values.

Reviewer Comment: However, in its current form, the manuscript reads more as a technical/software description with illustrative examples than as a rigorous validation and benchmarking study. The manuscript claims "computational efficiency," but no benchmarks are provided. There is no discussion of code performance, scalability, or resource usage. The authors should include benchmark (e.g. runtime vs model size, CPU/GPU usage, memory requirements) and ideally scaling test to support this claim.

Response: We agree that claims of efficiency require empirical support. We have added a dedicated benchmarking & performance section (Section 3.6). This includes runtime, memory usage, and scaling metrics across small, medium, and large model domains utilizing different compute configurations (e.g., CPU vs. GPU).

Reviewer Comment: One valuable contribution of the software is the image-based geometry workflow (PNG + JSON) for model construction. This approach significantly simplifies model setup compared to traditional mesh-based or script-defined geometries, especially for geometrically complex or highly heterogeneous media. However, the authors should also discuss the potential limitations of raster-based geometries, such as resolution dependence and staircasing effects, and their impact on numerical accuracy. In particular, the relationship between pixel size and model resolution could introduce aliasing effects. It would be very useful to provide a practical guideline, for example, in terms of pixels per wavelength.

Response: We have added a discussion addressing the limitations of rasterized input models in Section 3.3, specifically highlighting staircasing artifacts along inclined boundaries and spatial aliasing. To guide users, we included a practical recommendation based on literature specifying a minimum spatial resolution threshold in terms of pixels to maintain numerical accuracy.

Reviewer Comment: Figure 4: In the caption, profile ZOP2 is mentioned, but this profile is not introduced or described in the text, leaving the reader without context. As ZOP2 is not defined, the figure is difficult to interpret.

Response: We updated it to formally define and explain its experimental setup based on the field configuration from Gusmeroli et al. (2010). This provides the necessary background for the parameter choices shown in Figure 4 and its caption.

Reviewer Comment: Figure 8: The left panel lacks a label on the horizontal axis.

Response: Corrected. We added the missing horizontal axis label to the left panel of Figure 8.