General notes:

We included the original comments in black, followed by how we addressed them in the revised paper in green. We also included the most important comments and question from the annotated pdfs but considered all comments in our revision. We thank the reviewers and the editor for their constructive comments and suggestions.

Reviewer #1 - Juan Alcalde

There is too much detail on the methodology used and the results obtained in the introduction. IMHO the introduction should serve to introduce the reader the background, the problem(s), and how the authors are going to deal with them in the paper, but not to provide too many details on this last bit (because that's what the paper is about!). I strongly suggest to reduce the last paragraphs in the introduction by limiting the details on the methods and results obtained. Also, please use of more references in the first lines of the introduction when possible, when referring to general aspects of the mineral exploration history (e.g. need for RM, mine abandonment in the 60s and 80s…).

Thank you for this hint. We agree, there is too much detail in the introduction. We reduced the details about the methodology and results and added more references.

You should include more geological information in the manuscript. Critically, the paper lacks of (1) a lithological column, and (2) a geological interpretation of the results. Currently, the results are only described (reflector x appears at this depth with this dip), but there is no trace of a geological interpretation of these reflectors. I understand the value of a methodological paper like this one, especially given the excellent results that you obtain, but the readers will like to see what can you do with these results, even if the interpretation is subtle. There is only a hint of an interpretation in Figure 10, but the clarity of this image (particularly of fig. 10d) is very poor.

We tried to improve the chapter about the geological interpretation (including a table for all described reflections, their orientation and possible interpretation), in conjunction with more details about the lithology in an additional section. We also improved the quality of the figures, with readable axes and tried to change the view angle such that the 3D orientation of the picked surfaces appears clearer.

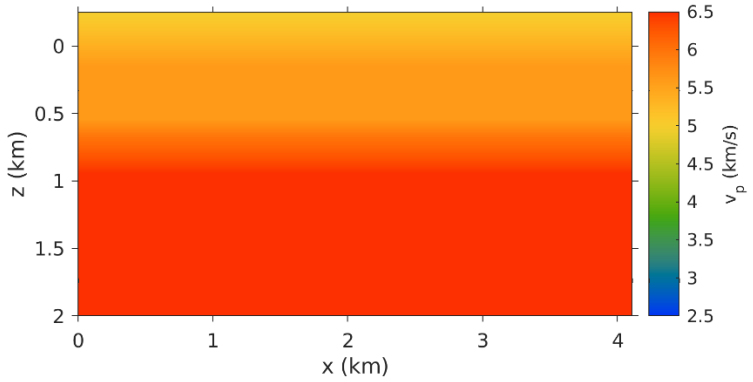
Given that you compare your results with the data in Malehmir et al, 2021, I wonder if it'd be possible to have a new image explicitly comparing one of yours and Malehmir's section, so that the readers don't have to go back and forth to the other paper. -Only if there are no copyright issues-

Such a direct comparison would increase the length of the manuscript considerably. We would also need to give several details about the different processing steps, stacking velocities and imaging techniques. It is planned that there will be a summary and

comparison paper including all results published about this 3D data set, so we do not include such a comparison here.

Same for the velocity model. It seems to be a very important input to achieve your final image, would it be possible to show a section of this model crossing the mineralisation to perceive the level of detail and resolution?

It is moderately important here; however, it is still very simple (1D gradient model), see the figure included below. Such an additional image would not show any important additional relevant information, so we decided not to include it. We included borehole logs in the geology section including p-wave velocities for the host rocks and the mineralization.



The axes values are not readable in most figures. I couldn't read the depths in any of the figures.

Thank you for this really important hint. We followed the recommendation and revised all figures to increase the readability of the axes values.

Annotated pdf:

Line 27: There is too much detail on the methodology used and the results obtained in the introduction. See the main issues explanation

We rearranged the Introduction, see above.

Line 88: This is a quite bold statement. Do you infer this in this article or in previous works? Can you provide a reference to support it?

We removed this statement. This was a more technical statement since we can use the true 3D geometry for sources and receivers for traveltime calculation and such for the migration.

Line 91: everything has a topography, what's the issue in this particular case?

We specified this statement. The focus is on the significant variation in topography.

Line 129: Where is this image coming from? The 2D sections? The PSDM model from Malehmir?

The model is based on the previous 2D survey data from mining activities and borehole logs. We included this information in the text.

Line 161: You could add here a brief (1-paragraph) description of the workflow that you have used and the overall purpose of the main steps, as an introduction for the next subsections

Yes, we included such a description.

Line 194-195: Really? Clearly? (*in reference to: one can clearly see that there is a better alignment of the energy visible in the stacks produced with the application of the GLI3D statics*)

We specified where the difference is well visible. We hope this makes it clearer for the reader.

Line 215-216: Do you have any velocity info from the boreholes to match this 1D model? How is this comparable with the velocity in Malehmir et al's models? Given that the velocity model greatly improves the quality of the migrated image (as you claim in the following paragraph), and that seismic velocities are probably the biggest uncertainty in mineral exploration I think it's worth expanding a little bit more the description of the velocity model and its implications, here and in the discussion.

We included borehole logs for one borehole, showing the velocities along the borehole trajectory. We also included a discussion about these velocities. The velocities are not varying a lot. The reflectivity is caused mainly by a contrast in the density. The stacking velocities of Malehmir et al. are not directly comparable since they used a time migration followed by a time to depth conversion of the migrated section.

Table 3: Why is this depth in negative values and the rest in positive? Also, you could add a row with the replacement velocity at the top

This depth is negative because it is the depth below sealevel. We included this in the unit. The first row is identical to the replacement velocity.

Line 224: is it applied to each shot or in one shot every 10m?

It is applied to each shot. We made this now clearer in the text.

Line 235: But how did you know about this? The boreholes? The 2D surveys? Outcrop geology?

We included more information about this in the geology section.

Line 255: Perhaps you could merge Figure 5 and 6 to save some space, since they are effectively used for comparison of the two images anyway

Yes, we merged both figures.

Figure 9: Better show without and then with interpretation.

We changed the order accordingly.

Figure 10: Pane d is really difficult to understand. Could you use a clearer image?

We tried to find a better view for that. (c) and (d) are showing the same orientation.

Reviewer #2:

Can the comparison of the resulting images between both methods can be quantified somehow (perhaps giving an estimate of the resulting signal-to-noise ratio)?

We have tried to quantify the signal-to-noise ratios for both results and added a paragraph to the manuscript explaining how we estimate the signal-to-noise ratio. We hope this value gives a more objective comparison.

The mansucript is focused on the geometry of the structures dipping reflecctors and their relationships. But why are they reflective structures, including perhaps a log of a borehole in the area intersecting the "known" mineralizations would certainly increase the interest of the reader.

We included some findings from borehole logs which explain the reflectivity of the mineralization.

Annotated pdf:

Line 94: Often argued where?? (provide reference to support this statement)

We removed this statement

Figure 1: Please include a map of Europe with a box in the study area

We included a map of Europe showing where the study area is located.

Line 154: deployed perpendicular tot he main road?

No, they were used to extend the profile further to the southeast. There the profile is crossing the main road.

Line 241: Why, please elaborate this issue to convince the interested reader

Using an average velocity could improve the imaged location of the reflector only locally. If the velocity changes over depth, then the average velocity can only be sufficient for a certain

part of the imaged reflector (since the reflector is dipping). We tried to give a clearer and more detailed explanation for this in the text

Line 251: Are the plotting display parameter in Fig 5 and 6 the same (contrast, gain, max amplitude etc.)

No, they are not. The values are different due to the weighting in FVM. The gain is also not exactly the same. We tried to find individual gains for which you can see the reflections well in both results. We included this information in the caption.

Line 264: The improvement is based on a subjective approach comparing both images visualy., Can a more objective approach be considered, as the appearance can vary according to the ploting parameters (contrast, gain etc).

That is true, it is mainly a visual comparison. As mentioned in the general part we tried to quantify the signal-to-noise ratio.

Line 378: The authors emphasize the fact that they are know mineralizations, but the reader would appreciate information on the contrasts in physical properties between the back ground and the know mirelizations (what ar the miinerals, (Cu, Zn magnetite ?). I know the authors make al the necesary references to previous manuscripts, but having a log showing the borehole constraints on the mineralization would provide valuable information to the reader, as whay are the reflectors reflectives with respect to the background.

We included borehole logs showing that the reflectivity is mainly caused by a change in the density of the mineralization compared to the surrounding bedrock.