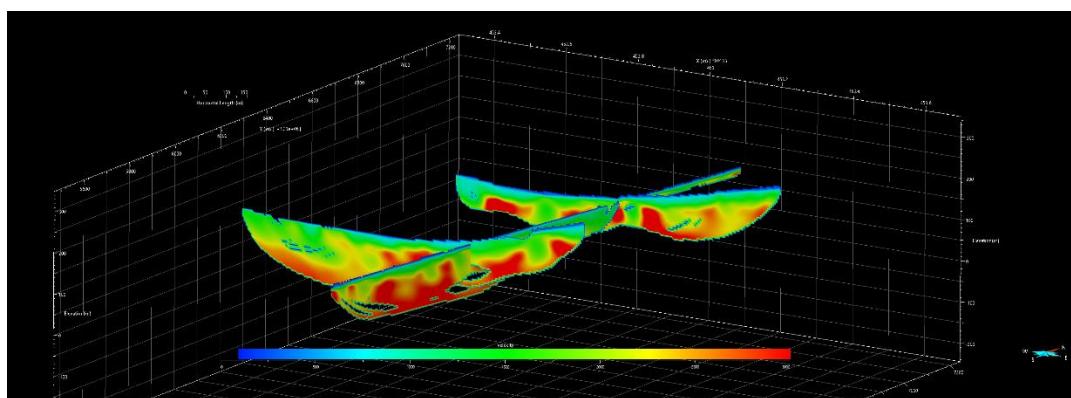


Dear reviewer 2,

Thank you for your valuable comments that helped us improving the quality of this paper. Most of the suggested comments have been implemented and when not possible, a detailed explanation is given.

Following you can find detailed replies to your comments.

1. R: The title has been updated to be less ambiguous, more concise and more focused on the geophysical aspect as follow “Reflection seismic imaging across the Thinia valley (Greece)”
2. Lines 33, 50, 55, 58, 68, 83R: You are right. The figure was modified but the text was not updated. Now the text is updated according to the figures. Thanks for spotting it.
3. Lines 62–64R: Thanks for the comment. We removed the phrase summarizing the findings in the introduction and we better defined the manuscript content.
4. Line 71R: Text updated.
5. Lines 159–160R: Thanks for the comment. Text has been updated to properly match the figures.
6. Figure 6R: The velocity profiles intersect only on a single point because the velocity model from profile 3 has no values at the intersection with profile 1 (see following figure as reference). Since no 3D analysis or interpretation are carried out in this study and since a 2D display of the profiles enable to visualize more details respect than a 3D visualization, we think that a 3D visualization of the velocity models will not add any useful information to the paper while hiding important features. Still, if the reviewer insists we can add a figure with the 3D visualization of the velocity models.



7. R: The coherence of reflections across profiles is not analyzed in the paper since migration of all profiles was not possible (see reply to comment 10) and as you suggest it is meaningless to compare unmigrated profiles. We do not want to plot a 3D visualization of the seismic profiles to do not give the wrong impression that the interpretation is done on all profiles. Indeed, the interpretation is done only on profile 1 and only a very cautious suggestion of eventual corresponding features is done on the other profiles that is expected to be a base for future studies and nothing more.

8. Lines 165–166R: Text has been updated to give more details as follow: “first using the estimated NMO velocities, and then refining them with the evaluation of smiles and frowns in the resulting migrated sections”.
9. In Table 2R: We are not sure we understand the question; refraction statics are applied at step 11 of our processing flow as expressed in table 2. If something else is not clear please let us know.
10. R: We completely agree with the benefits of migrating all profiles and we largely tried before submitting the paper. Unfortunately, the low quality of the data in profile 2, 3 and CS and the absence of an accurate deep velocity model resulted on the migration of noise instead than of the reflections when migration is applied to the data. The quality of the acquired data is this for the reasons explained in the data acquisition chapter and we cannot change it. Reason why in our interpretation we only considered the results from profile 1 and we clearly stated that the quality from the other profiles is not enough for any interpretation, limiting ourselves to show the obtained results. Data from boreholes are shallow and discontinue and do not clearly intersect any main seismic reflector and therefore they cannot be used to tie the seismic sections. Text has been updated to make it clearer.
11. Line 221R: Thanks for the suggestion, the text has been updated as follow: “The unmigrated stacked section of profile 1 (Figure 7b) shows a higher S/N ratio and reflections continuity with respect to the other profiles.”.
12. Line 233R: The text has been rephrased for better clarity as follow: “The deepest of these reflections shows amplitude values, frequency content and shape of the signal similar to the ones from R2 reflection of profile 1 (Figure 7b) and considering its location (between 0 and -150 m a.s.l.), it could correspond to the same horizon. The reflection located at a depth of 150 to 50 m a.s.l. matches amplitude values, frequency content and shape of the signal from reflection R1 of profile 1 suggesting their correspondence.”.
13. Line 257R: The text has been updated to improve its consistency as follow: “Comparison with the boreholes lithologies (Figure 6) is more meaningful for profile 2 (Figure 6b) where the available boreholes are 90 to 100 m deep and reach an elevation of approximately 60 and 70 m a.s.l. (Figure 6b).” and “. Borehole C5a along profile 1 (Figure 6a) is only 30 m deep and reach an elevation of approximately 150 m a.s.l. (Figure 6d) showing low velocities corresponding to the logged marl.”.
14. Line 305R: Thanks for the suggestion, the text has been updated for a more scientific language as follow: “profile 1 showed higher S/N ratio and reflection continuity respect to the other acquired profiles”
15. Lines 307–309R: You are right and thanks for noting it. A phrase regarding the modeling in stack domain is added to the text (section 4.3) and the interpretation text is updated accordingly. The resulting modeled horizon is shown in figure 8.
16. R: As we said in the text, the north part of profile 3 is not reliable because of the source issue (visible also from the missing traveltime tomography) and therefore a comparison with profile 1 will be meaningless, without considering the migration issue detailed in comment 10. Furthermore, the N23°E/44°E means a slight dipping towards south and not towards north, with the strike almost parallel to profile 3 that should result on an almost horizontal apparent dip.