Review of the manuscript

Constraining the depth of the lithosphere-asthenosphere boundary in tectonically complex regions using locally adjusted lithological forward models and seismic velocities

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The introduction presents a clear aim to apply 1D migration of S-to-P receiver functions within an interdisciplinary framework to improve constraints on lithosphere-asthenosphere boundary depth. However, Section 3 Methods remains partly brief and general, and would benefit from further elaboration.

- The used RF methodology could be described in more detail. While it is understandable that the authors follow the procedure of Kalmar et al. (2023), the details of parameter setting would be good to mention.
- The authors mention the use of data from 41 seismic stations in the region, but provide no information about the data itself (parameters of selection, preprocessing, etc.).
- Also, information about the resulting Receiver functions, such as the number of RFs, back-azimuth coverage, and the quality of the RFs, is missing. Only the sums of S-to-P receiver functions are presented in Figure S3 (supplement). Further comments on Figure S3 are below.
- Additionally, the migration method would be good to describe slightly in this paper (even though it is already described in Kalmar et al. (2023)).
- At line 105, the right parenthesis is missing.
- At line 106, the AdriaArray initiative is mentioned. Please cite the paper Kolínský et al., 2025. AdriaArray – a Passive Seismic Experiment to Study Structure, Geodynamics and Geohazards of the Adriatic Plate. Ann. Geophys. 2025, 68 (5), DM555. https://doi.org/10.4401/ag-9284
- At lines 125-127: The statement about the complexity of the structures is vague, there is no clear indication of what the authors compare those structures to, and there is no example of what exactly is meant by good agreement.

Besides, it is not clear which data were calculated newly (during the work on this paper) and which were already published. In case that some figures have already been published, it should be mentioned (e.g., the stack of LTVH station – compare with Figure 5 in Kalmar et al., 2023).

Regarding Figure S3, it would be good to specify whether the stacks are from all backazimuths or a specific azimuthal sector only, and describe the content more precisely. For readers unfamiliar with the S-to-P receiver functions, it is unclear what is presented.

In Figure 2c, it would be helpful to reverse the y-axis to agree with fig. 2a and 2b.

In Section 5.2, the authors mention that at six stations (A265A, A272A, HU04A, HU21A, HU22A, JOS), receiver-function data were insufficient to produce an acceptable LAB depth. This would be beneficial to include at least as an explanation in Figure S3 (e.g., by showing the accepted peaks).

In Figure 7, it would be helpful to know which symbol belongs to which station, not only to which group (Alcapa or Tisza and thick or no (thin) sediment). Also, keeping the uniform axis scales at subfigures a - d would make the comparison clearer.

References to the seismic networks are missing:

- AlpArray Seismic Network (2015). AlpArray Seismic Network (AASN) temporary component, AlpArray Working Group, doi:10.12686/alparray/z3_2015
- Hetényi, G., Plomerová, J., Bielik, M., Bokelmann, G., Csicsay, K., Czuba, W., Meier, T., Środa, P., Wéber, Z., Wesztergom, V., Žlebčíková, H. (2019). Pannonian-Carpathian-Alpine Seismic Experiment [Data set]. International Federation of Digital Seismograph Networks. https://doi.org/10.7914/SN/ZJ_2019
- Kövesligethy Radó Seismological Observatory (Geodetic And Geophysical Institute, Research Centre For Astronomy And Earth Sciences, Hungarian Academy Of Sciences (MTA CSFK GGI KRSZO)). (1992). Hungarian National Seismological Network [Data set]. GFZ Data Services, doi:10.14470/UH028726

line 466: Babuska → Babuška

Seismic stations are sometimes mentioned as seismic stations, and sometimes as seismological stations (e.g., lines 12, 86, 96, 102, 358, 412). Unification using the phrase „seismic stations“ would be good. Similarly, seismological discontinuity (l. 49) and seismological data (l. 50); low velocity zone → low-velocity zone (l. 36, 39, 54, 205, 331).

It would be beneficial to review the text for grammatical accuracy.

I hope the suggestions mentioned above will help to improve the manuscript.