Solid Earth Discussions

Solid Earth Discuss., author comment AC2
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Reply on RC2

Gregor Rajh et al.

Author comment on "One-dimensional velocity structure modeling of the Earth's crust in the northwestern Dinarides" by Gregor Rajh et al., Solid Earth Discuss., https://doi.org/10.5194/se-2021-67-AC2, 2021

Dear prof. Rossi,

Thank you for the time and effort in reviewing our manuscript in such a short amount of time. The criticism you provide is very constructive and we hope we managed to answer all the raised points in a satisfactory way.

Regarding the suggestion to include S wave readings. We took this suggestion into account and calculated new models using P and S arrival times. We additionally calculated the S velocity model, which we used, along with the P velocity model, as an initial model in joint inversion for both P and S velocities. Furthermore, we took the P and S model and relocated hypocenters from the regional inversion, made earthquake selection for each subregion and did a P and S inversion for each of them. For each additional inversion we did all the tests as already described in the manuscript. We included the results of the newly done inversions in the manuscript and its supplement. Judging by relocations of earthquakes and blasts, we estimate that the hypocentral depths were improved by using P and S models. The recovered models show a change in velocity but retained their main features.

Regarding the lack of seismicity above 8 km in the NW part of the region. We think there has been a misunderstanding. It is not a complete lack of seismicity above 8 km depth in the NW region that we are talking about, but rather a region between approximately 13.7° E and 14.2° E, as seen on the lower left panel of Figure 11 in the manuscript. The very NW corner is obviously seismically very active also at depths above 8 km. We made this more clear in the revised manuscript.

The GEOFON, 2021 is already in the reference list (lines 604-607).

The comment on Figure 11 is similar to what the other reviewer (RC1) proposed. We took it into account and prepared the figures shown in the supplement (Figures S1, S2, and S3). Unfortunately, none of the new figures show a shift in hypocenters clearly due to the large number of earthquakes, especially in clusters. Our intention by adding the routine locations on a map was to show that hypocenters actually shifted, but because of a large number of them it is impossible to show by how much. Because we want to emphasize the relocations, we decreased the size of the markers on the main map and put the relocated hypocenters on top of the routine ones (Figure S3). Shift in depth of the hypocenters can already be appreciated by looking at the panel with the depth distribution of both the

routine locations and relocations. Additionally, we added the statistics of the relocation into the text.

As far as the more detailed comments and the additional references are concerned, we included them in the revised manuscript.

Redundant references have also been removed from the list.

Thank you.

With best regards,
the authors

Please also note the supplement to this comment:
https://se.copernicus.org/preprints/se-2021-67/se-2021-67-AC2-supplement.pdf