Solid Earth Discuss., editor comment EC1
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Comment on se-2021-56

Emanuel Kästle (Editor)

Editor comment on "Two subduction-related heterogeneities beneath the Eastern Alps and the Bohemian Massif imaged by high-resolution P-wave tomography" by Jaroslava Plomerová et al., Solid Earth Discuss., https://doi.org/10.5194/se-2021-56-EC1, 2021

Dear Authors,

I have received comments from two reviewers who both think that the manuscript would make a good addition to this special issue. The reviewers' main concerns relate to the clarity of the method description, the influence on the applied crustal correction and to the clarity of the figures and the discussed tectonic implications. in addition to the two reviewers' comments, I have a few minor remarks listed below.

I would like to suggest a major revision of your manuscript paper before it can be further considered for publication in SE. Please address all the reviewers' comments in your revised manuscript.

Best regards,

Emanuel Kästle

Minor comments:

Please note that the anomaly you describe below the Bohemian Massif is very similar to the previously reported one in Kästle et al. 2018 ("Surface-wave tomography..."), who also imaged two fast anomalies in the uppermost mantle: one below the eastern Alps and a second anomaly below southern Germany and the southern part of the Bohemian Massif: "A second fast anomaly, also subparallel to the Periadriatic Fault, is visible approximately 1° farther to the north. It has its highest amplitude in southeastern Germany; hence, we denominate it the Eastern Alpine Northern Anomaly (Figure 12)." This would support your finding of a secondary slab/thickened and cold lithosphere north of the Alps.

l. 37 For a review of different slab models under the Alps, Kästle et al. (2020, "Slab break-offs...") would also be a good reference that discusses the entire Alpine arc.

l. 271 Dando et al. 2011 never clearly state that they attribute the eastern Alpine slab to the subducting Adriatic plate. Instead they report a "Continuity of the Pannonian fast anomaly with the East Alpine fast anomaly" and state "The interpretation that emerges from our images is that a continuous collision zone extended from the Alps through present-day western and central Hungary. [...] When extension began in the Pannonian

Basin, the higher velocity material detached from the lithosphere, indeed the Pannonian Basin extension may have been triggered by the detachment of this cold material produced by prior convergence." This would rather be in agreement with the European subduction that is interpreted to be continuous from Alps to Carpathians prior to 20 Ma (e.g., Handy et al. 2015).