Solid Earth Discussions

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Reply on CC1

Jaroslava Plomerová et al.

Author 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-AC2, 2021

Thank you for reading our work. Regarding the CC1 comments, none of cross-sections through the Eastern Alps in Fig. 8 of Mitterbauer et al. (2011) shows southward dipping slab in the upper 250-300 km, but it dips steeply to the North. Cross-section in Fig. 9 of Mitterbauer et al. (2011) along the C profile of Lippitsch et al. (2003) shows similar, undoubtedly towards the North dip of the Eastern Alpine slab both in the Transalp and ALPASS tomography. Fig. 5 b-f presents examples of 5 profiles though different tomography, calculated with different codes, data and crustal models. All of them show the northward dip of the subduction beneath the Eastern Alps. Results are of similar size (geometry). The images show what we describe, but the author original interpretations are different. See line 48 of our ms.

To stay neutral we guote Hua et al (JGR 2017):

Parts of the Vardar ocean revealed by the kinematic reconstructions studies [Channell and Kozur, 1997; Stampfli et al., 1998] subducted toward the north beneath the Austroalpine, forcing the Adriatic continental lower lithosphere to subduct northeastward beneath the Austroalpine [Lippitsch et al., 2003]. This interpretation can explain the location of the northward subducting continental slab beneath the Eastern Alps and the dip polarity change from the European plate below the Adriatic plate to the Adriatic plate under the European plate [Lippitsch et al., 2003; Schmid et al., 2004; Mitterbauer et al., 2011], which are generally consistent with the results of numerical simulations [Luth et al., 2013].

For changes in subduction polarity along the Alpine chain, we used a term reversed polarity, as one of generally used expressions - polarity switch (e.g. Handy et al.), opposing polarity, reversal in subduction polarity, flipping in subduction polarity (e.g., Teng et al., Geology 2000).