

Dear authors,

The revised version of your manuscript takes into account the reviewers' comments as well as mine. I therefore consider that it does not need further review by the reviewers. I have read the revised version carefully myself, and have noted a series of corrections that you should be applied before the manuscript can be accepted for publication. A large majority of these comments deal with typos, incorrect English writing, or shortcuts in references to publications. They are listed below. Please note that line numbers refer to the authors's tracked change version, and not to the revised version.

Dear Anne Paul,

Thank you very much for reviewing our updated manuscript. Please find below our detailed comments in blue. We also made some smaller adjustments due to the input of our co-authors on the most recent version that you can find in the authors' tracked changes file. We also updated Fig. 5 which now shows azimuthal distribution of picks on a logarithmic axis instead of events, as we found this information to be much more instructive.

Kind Regards,

Marcel Paffrath

A more important comment deals with your discussion of the potential effect of seismic anisotropy on the results of your (isotropic) teleseismic travel-time tomography (lines 506-513). You write that "steeply incident teleseismic P-waves passing through these mantle regions tend to be slower than the isotropic average because they propagate in a plane perpendicular to the fast axis". This is wrong in most cases because, in first approximation, teleseismic P waves propagate in the vertical plane defined by the source-receiver back-azimuth which is generally not perpendicular to the fast-velocity direction of the SKS anisotropy. However, it is right that anisotropy related to subduction induces artificial low-velocity anomalies around slabs in seismic tomographies of subduction zones. This effect has been studied by Bezada et al. (2016, doi: 10.1002/2016GC006507). You should correct this paragraph in view of their results and refer to their paper. In l. 514, you start the sentence on the Eastern Alps with "in contrast", which probably means "in contrast to the Western and Central Alps". There should not be any difference between the Western, Central and Eastern Alps for the influence of seismic anisotropy on the results of isotropic travel-time tomography because the SKS results show similar (mostly strong) delay times from west to east.

We added the citation and changed the paragraph slightly. We now write that the teleseismic P-waves propagate nearly perpendicularly to the fast axis. We have added that anisotropy may also contribute to the negative anomalies east of 10°E, but that new results by F. Link indicate a weakening of anisotropy east of the Tauern window and we prefer an interpretation of the low velocity anomalies due to asthenospheric upwelling.

In this revised version, you added both an appendix (Fig. A1 and comment) and a supplementary information file, while you refer to appendix A1 as being part of supplementary material (l. 218), which is not the case. Please homogenize.

Okay, done

You refer many times to the models of Diehl et al. (2009), Zhao et al. (2016), Lippitsch et al. (2003), etc. by using shortcuts such as Diehl's, Zhao's, Lippitsch's, etc. I would suggest replacing all shortcuts by the correct references. Another way would be to introduce the shortcuts in the first citation with, for example, "Diehl et al. (2009), hereinafter referred to as Diehl".

Okay, done

Minor comments:

- L. 267: do you mean « coefficient value of 0.6 with respect to the beam trace » ?
What is the beam trace?
[Yes we mean with respect to the beam trace. It is the stacked trace of each event.](#)
- L. 296: analysis=> matrix?
[Okay](#)
- L. 359: for both coarse and fine checkerboards
[Okay](#)
- L. 365: leaking=>leakage
[Okay](#)
- L. 491: theories=>hypotheses
[Okay](#)
- L. 507: Barruol et al. (2011) was the first of a long series of papers on SKS anisotropy in the Alps; you should therefore add "e.g." before the reference.
[Okay](#)
- L. 513: signify the presence of=>be due to
[Okay](#)
- L. 585: comprises=>encompasses
[Okay](#)
- L. 588: Zhao (Zhao et al., 2016, personal communication)=> Zhao et al. (2016) (L. Zhao, personal communication)
[Okay](#)
- L. 589 : Koulakov (Koulakov, 2021)=>Koulakov et al. (2009)
[Okay](#)
- L. 592 : model=>models
[Okay](#)
- L. 595, 596, 692 : delete « already »
[Okay](#)
- L. 596 : at least
[Okay](#)
- L. 600 : (16)=>16
[Okay](#)
- L. 601 : the the=>the
[Okay](#)
- L. 603 : Alpine Tethys
[Okay](#)
- L. 614 : and (E=>and E
[Changed to \(E\) \(Fig. 16...\)](#)
- L. 634-635 : the question of the role played by crustal corrections
[Okay](#)
- L. 643-644: it is favourable if the teleseismic inversion is allowed to change the structure also in the crust=>it is beneficial that teleseismic inversion is allowed to change the structure of the crust as well

- Okay
- L. 646-647: delete “especially” and “therefore”
- Okay
- L. 656: delete “certain”
- Okay
- Caption Fig. 10: including a priori=>including the a priori; including slightly=>including the slightly
- Okay
- Fig. 14: detachement=>detachment
- Okay
- Caption Fig. 14: Profile distance=>Distance
- Okay
- Caption Fig. 15: on longitude=>at longitude
- Okay
- Caption Fig. A1: meaning of “we set the a priori variance highest at 15% of the model reference velocity”? Rephrase.
- Okay

Regards
A. Paul