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Solid Earth Discussions

Interactive comment on "Mantle flow below the central and greater Alpine region: insights from SKS anisotropy analysis at AlpArray and permanent stations" *by* Laura Petrescu et al.

Anonymous Referee #3

Received and published: 28 April 2020

Review for Petrescu et al.

This paper is well organized and well written. I recommend publication with only minor revisions.

1) The introduction section needs more information about anisotropy. There should be some mention of anisotropic fabrics especially when there is later discussion of lithospheric (A-type) versus asthenospheric (C- and E-type) anisotropy. a. I don't know how applicable this is in the Alps, but it seems like some of the invoked mantle flow is where the wedge would traditionally be located. So B-type fabric may also be worth mentioning.

2) Did the authors examine different frequency bands for splitting? 0.3 Hz seems on the high end. a. How does this frequency band compare to the previous studies of splitting in the region? b. Might some of the variability in splitting be coming from the Alpine crust since high frequencies are being included?

3) In the Methods or Results sections, please include error information such as maximum allowable and average errors in phi and dt.

4) Did you use Splitlab? SplitRacer? Sheba? Or your own splitting program?

5) How well do the null orientations agree with the splitting directions in each region? a. The nulls in the NW alps obviously don't have a lot of splits at those stations, but is that telling of downwelling?

6) Did the authors try modeling splitting with layered anisotropy in the NW Alps where single station splitting variability is high?

7) In figure 4c, I think it would help to show the null pierce points as well a. That might be what the red dots are, in which case that should be in the caption.

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