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Interactive comment on "Traces of the crustal units and the upper mantle structure in the southwestern part of the East European Craton" *by* I. Janutyte et al.

Anonymous Referee #1

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In this paper, the authors report a 3D P wave velocity model in the upper mantle beneath the Trans-European Suture Zone (TESZ) and East European Craton (EEC), with PASSEQ dataset and tele-seismic tomography technique. Some intriguing structures are resolved, such as a ramp shape of LAB in the northern TESZ, no clear LAB beneath EEC, and a possible upper mantle dome in western Lithuania. Those observations complement our current understanding of EEC. The writing is clear and fluent. I think it is acceptable after some minor revisions. Here are my comments:

1) In the travel time picking, different quality factor is assigned to the data. How is the quality factor calculated, according to the manual picking error? Is it taken into account in the travel time inversion? If yes, how to weight the data in the inversion?

Does the weighting affect the final result significantly? 2) In fig.7, authors show the inverted velocity slice at 90 km without crustal TT corrections. The result with crustal TT corrections is shown in fig. 12. In my opinion, it is hard to see the big difference, partially due to the small size of fig. 12. It would be better to compare them back-to-back to observe the effect of crustal TT corrections. 3) In tele-seismic inversion, extra error could be introduced since not the whole ray path is included in the inverted model space. In this study, the model is truncated around the depth 350 km. Is it large enough for the source-receiver geometry used here? 4) In the abstract, please elaborate the TELINV and EEC. 5) Pg 1014: Fig. 6 caption line 3 "low signal-to-noise ratio" should be "high signal-to-noise ratio"?

Interactive comment on Solid Earth Discuss., 6, 985, 2014.