

Dear Marek, Dear co-authors,

Reading carefully both reviewer comments and your manuscript “Seismic LAB or LID? The Baltic Shield case”, submitted to the special issue of the Solid Earth Journal, I encourage you to try to rework substantially your manuscript according to comments, recommendations and suggestions of the reviewers, though one of the reviewers rejected the manuscript. In fact, both reviewers criticize amount of data and inadequate conclusions drawn from the analyses as well as insufficient discussion of the results in the light of previous results achieved from much large data sets of CSS and other methods/data. Bellow I add some addition comments from my side:

- 1) The title is incorrect and confusing. Consequently, no answer to the question mark can be found in the conclusions. The title must changed, if resubmitting is considered.
- 2) A decrease of velocity gradient with depth is sufficient in the Gutenberg’s definition of the asthenosphere.
- 3) Other methods (e.g. teleseismic body waves) of detailed mapping LAB in Fennoscandia are mostly ignored.
- 4) Statement on “non-existence LAB” is above the method and data resolution.
- 5) Pn wave propagations from nine (ten) EQ (*event no. 8 is missing in Fig. 2*, complement the figure) represent different directions of azimuthally dependent velocities in the upper mantle. Some of the events represent more or less narrow fan of azimuths, some of them are mixtures of various directions. What is the meaning of blue region in Fig. 14a (very simple conclusion) if results shown in Figs. 12 and 13, with events in approximately opposite azimuths, are compared? What is the meaning of average velocities high-low n Fig. 14? Each record section shown should show stations and the source, to get sense about directions of propagations and distances, similarly as it is in Fig. 5 (event No. 9, Rhine Graben in the figure caption) but with a proper one figure. Here it is event No. 3 Lubin. ***Find the appropriate event and record sections and correct.***
- 6) In general, the figures are very small, red dots totally mask quality of the first arrivals and declared features do are documented inconsistently. The authors could consider publishing all the ‘clean’ record sections in supplements.
- 7) Velocity uncertainties of ± 0.05 km/s are wishful as well as the provided “effective model (average) of the lower lithosphere”. It is a very rough model, a kind of a step backward. Processing more data (if exist) and only sound interpretations should be considered.
- 8) Most of the stations are located in the Svecofennian and Archean parts of the Baltic shield. No wanvs sample the mantle beneath the Caledonian part (cf. Figs. 2 and 14). Why you characterize the region as Caledonides (see also Fig.2) and the northern Baltic Shield? This must be corrected as well. Tectonic features – KR, MR, COT – how they relate to the region, no foci, no stations.... Better would be to show tectonics of the shield.
- 9) page 701: ***wide*** ? transitional zone... LAB, see e.g. Eaton et al., 2009
- 10) Page 730, Fig. 8 – Do you believe your LAB estimate of 201km depth has a one km accuracy?
- 11) Page 733, Fig. 11. Top two panels can be joined together.

Combining different methods and data is an important step in our understanding Earth’s mantle structure. However, one has to keep in mind both advantages and disadvantages, resolutions and validity of individual results. Thorough discussion of previous results is necessary. This can also help in evaluating validity of results from only a small amount of data with limited resolution in comparison with other advanced methods.