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Solid Earth
Discussions

Interactive comment on "Seismic imaging of dyke swarms within the Sorgenfrei Tornquist Zone (Sweden) and implications for thermal energy storage" *by* Alireza Malehmir et al.

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The article presents an interesting case study conected to important problem of the thermal energy storage. The authors use variety of geophysical methods in well thought out analysis that gives an interesting conclusions. Also the study area with dykes directly observed in quarry is a difficult, but interesting case. Gathered data, a combination of wide-angle refractions and reflections, are also good quality and has been collected with state of the art equipment and techniques.

The manuscript is in general written with clear and easy to understand language, at least for not native speaker.

I have seen those results before at the conference, and had a positive impression about the whole concept. However, I got a few comments that, in my opinion, should improve the overall good level of the article.

1) Seismic has been measured with two types of the equipment, cable and wireless system. What was the frequency of the cable system geophones? Was is also 10 Hz as wireless described in text? Why is the noise level so different between the observations with as presented in Fig.5 and 6?

2) In paragraph 3.2 authors describe processing steps. Unfortunately, important prestack data enhancement is not described in details (only mentioned in table 2). What has been used in this step? Also paragraph mention importance of the velocity analysis, but in all processing a constant velocity has been used. Why tomographic results has not been utilised to create a velocity model for further processing steps?

3) Fig.7 - why noisy part of the data is totally muted? It is a critical part of the results. I understand its quality is poor, but at least there should be a hint of the structure.

4) Fig.9 P2 and P3 tomographic results shows very deep and sparse penetration of rays. This might lead to artificial increase of velocities in places marked as B2 and B3, that is further used in the interpretation. This tomographic inversion should be calculated with limited space preventing rays from escaping downwards. Only P4 tomographic results looks realistic.

Some small technical and typographical corrections:

Page 13, line 20 – reference do fig. 12 should be added

Page 14, line1: alone > along

Fig.14 colour scale is missing, isolines are not described

Page 20, line 9: also be dipping -> also to be dipping

Page 21, line 9: Could you please describe what filters has been used?

Page 21, line 17: I see no red dashed lines in Fig.16

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