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Solid Earth Discussions

Interactive comment on "The crossdip correction as a tool to improve imaging of crooked line seismic data: A case study from the post-glacial Burträsk fault, Sweden" *by* Ruth A. Beckel and Christopher Juhlin

Anonymous Referee #2

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The contribution is interesting and it is worth pursuing its publication. The authors developed a tool which corrects crossdip effects in crooked seismic lines. The correction is applied to the data before stacking. In contrast to other methods, they use an iterative, manual procedure to overcome some disadvantages in the other methods. The method is demonstrated for synthetic data and to crooked line crossing the post-glacial Burträsk fault in Sweden, showing a significantly improved stacked image.

The manuscript is well-written, logically organized, and the figures are appropriate. To increase the value of the manuscript there a few things that I would suggest:

P 2 / L 18-19: " none of the existing correction methods is optimally suited to image a feature like a post-glacial fault" I would welcome some more discussion why these methods are not optimal in this specific case.

P4 / L10-13: It would be helpful to mark some of the mentioned aspects in Fig. 2. E.g. with A,B,...

P4 / eq. 1: use p_x instead of p for the inline slowness.

P 5 / L5: add A and B: "crossdip at 0.4 s (A) and 1.2 s (B)"

P 5 / L6: mark the CDP 350 and 1350 in Fig. 2.

P 5 / L7: "visible in the stack (Fig. 3b)."

P11: The reference to Fig. 9 appears before the reference to Fig. 8 in the text. This should be in order.

P13 / L3-8: Which types of migration were tested?

P13 / L9-11: What was the velocity model used for? Was migration also tested with this velocity model? How was the migration result using the tomography result, compared to the 5.4 km/s constant velocity?

P13 / L13-14: Add b c and d in the text.

P16 There is a discussion about the origin of the reflectivity. You are discussing about positive and negative impedance contrast which would mean either a mineralizated, or a shear zone. Were the polarity and shape of the reflections analyzed? Are there any indications about impedance contrasts or e.g. tuning effects?

P17 / L8: "has has"

Fig 2: Some colors are hard to see (e.g. the gray box and the white numbers)

Fig 3b: Mark the shifted reflection B as you did it in Fig. 3c for the double reflection

Fig 9: Add A1 – 3 and B1 -4 also to c and d. This would make it easier to follow the descriptions in the text.

I think it would be illustrative to add a figure showing a CDP gather for the real data example: before and after crossdip correction and a comparison of the stacked sections (as for the synthetic model in Fig. 3).

It is not stated explicitly in the text, but I guess the module is written for GLOBE Claritas.

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