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Interactive comment on "Migration of Reflector Orientation Attributes in Deep Seismic Profiles: Evidence for Decoupling of the Yilgarn Craton Lower Crust" *by* Andrew J. Calvert and Michael P. Doublier

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Comment 0: What are the advantages of the automated method compared with the traditional manual approach?

Response 0: We now include a brief comparison of the automated reflector orientation estimation method with manual cross-dip selection, and reference the paper by Beckel and Juhlin (2018).

Comment 1: It would be useful to see a plot of crooked line with examples of where

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the source-receiver azimuths are sufficient for the estimation.

Response 1: We have not included a map of the line in the paper, because it does not really add that much to the basic map in Figure 1; however, for the information of the reviewers we include in our response here a more detailed display of the acquisition profile corresponding to the seismic data shown in Figure 2. We have also now included a section in Figure 2b showing the strike estimation error, indicating where source-receiver azimuths are insufficient for good orientation estimates.

Comment 2: Can more reflections be interpreted as intrusions with T being an old feeder dyke?

Response 2: We now note that reflection T could be a feeder dyke, and mention the possibility that some of the imaged reflections arise from later intrusions. We also cite the paper by Juhlin et al. (2016).

Comment 3: Was 3D binning followed by stack tried to determine the orientation of some reflections?

Response 3: We did not stack the data after 3D binning to estimate reflector orientations. One important limitation of this approach is that the stacking velocity required for an accurate moveout correction is azimuth and dip dependent. 3-D DMO would help with this problem. However, by estimating the reflector orientations directly from the prestack data, as we have done, limitations due to having to apply a moveout correction are avoided.

References

Beckel, R.A., and Juhlin, C.:The crossdip correction as a tool to improve imaging of crooked line seismic data: A case study from the post-glacial Burtrask fault, Sweden, Solid Earth, doi:10.5194/se-2018-120, 2018.

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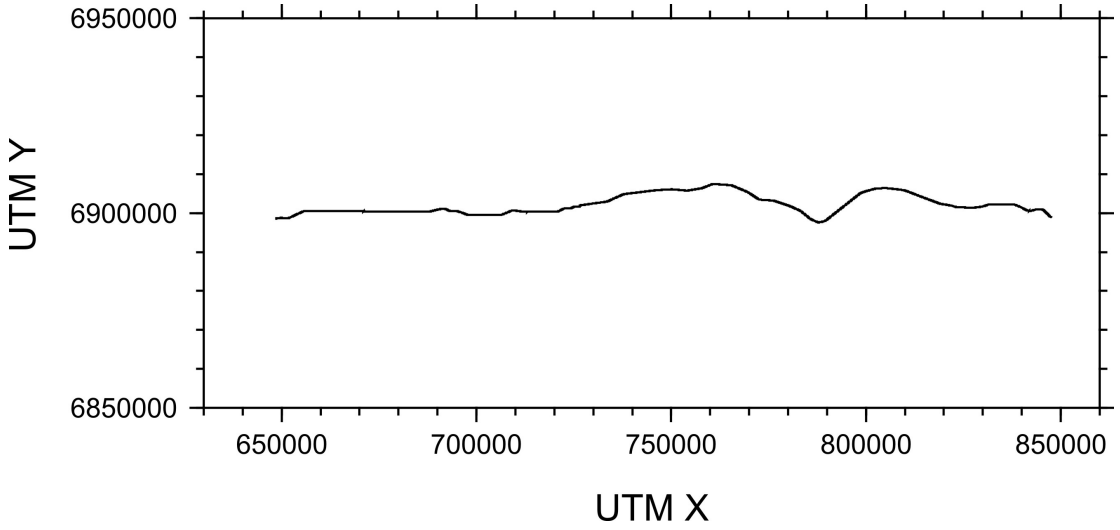

Fig. 1.

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