Interactive comment on "Seismic imaging across fault systems in the Abitibi greenstone belt – An analysis of pre- and post-stack migration approaches in the Chibougamau area, Quebec, Canada" *by* Saeid Cheraghi et al.

Fomin Tanya (Referee)

tanya.fomin@ga.gov.au

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General comments:

1. Well written paper with a clear objective and straightforward structure. This case study example is very useful and practical for seismic processors. In these days PSTM and PSDM methods become most popular and DMO technique called "old fashioned" not used broadly anymore by commercial processing companies (even some seismic software not include DMO in their packages). 2. I think one of the difficulties of this

topic that you cannot provide "a recipe" what would be the best technique DMO, PSTM or something else for particular geological environment until you test it and apply all possible methods. That is not very practical. It would be good at least if you provide some recommendations on possible processing flows for different geological environments for example DMO should work for some areas and not really useful in others. 3. It is a very detailed interpretation section of seismic reflectivity which is very good but could be over interpreted.

Line 20 – methods instead of method Lines 21-22 – What was a reason of 3km increment and was a step 3km or you checked as well 2-4km, 3-5km etc? Would be 0-3km offset recommendation or it has to be checked for every seismic survey. Line 27 – From the Figure 1 it looks like Profile just stops before the Doda fault and not crossing the fault.

Line 54 – Cheraghi et al., 2012 is not on the list of References Line 64 – Bellefleur et al., 2018 is not on the list of References

Line 84 – David et al., 2011 is not on the list of References Line 103 – Dinmroth et al., 1995 spelling and is not on the list of References Line 108 – Daigneault and Allard, 1990 is not on the list of References Line 111 – Bedeaux et al., 2020 is not on the list of References

Line 127 – How is significant to have more denser VP instead of receiver spacing (cost is more for shots not for channels)

What is a Moho depth? Why is only 12 sec record length? Was any testing for higher ending frequencies 150Hz or even higher? Line 143 – Common lower case Line 169-170 – "We designed offset . . . " Was this designed only based on visual assessment or something else?

Line 221 – You don't need to have "The distribution. . ." sentence second time. In the Figure 4 offsets 0-3km, 3-6km and 6-9km. In the text, it is 0-3km, 0-6km and 0-9km.

Am I wrong of reading that?

In Table 2 First arrivals picked up to 10km. Is any need for that? I assume this is a one-layer refractor model? Why top muting but not just stretch with some %?

Line 251 – Why was used a constant velocity for DMO corrections?

Figures 5 and 6 should be Depth converted migrated sections?

Line 385 – See capital

Figure 9 You need better arrow for the fault location (similar to figure 8)

Line 518 - shot gather 15135 but in the figure 13135

Line 648 – Vermeer, 1994 is not on the list

Line 652 – 653 " The pre-stack depth migration . . ." something missing in this sentence?

Line 697 – Is it 2018? Line 738 – I could not find this reference in the text.

Final remarks

It is a good and useful paper for people who process seismic data particular for hard rock data sets. We need to be very careful and not to over interpret reflection seismic data by trying to fit to geological model.