

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.

Anonymous Referee #3

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The manuscript presents a processing strategy to image strong dipping reflections from a crooked-line acquisition. The manuscript is well written and the methodology is well described. Although, the geological interpretation is not really developed. The manuscript should be a significant and valuable work, and it fits the scope of Solid Earth’s special issue “State of the art in mineral exploration”. However, some suggestions and technical comments are as follow:

1. It is not clear why the different offset ranges of 0-3, 3-6, and 6-9 km are selected, even considering that the seismic profile is 10 km. In addition, during the text, these

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ranges are changing from 0-3, 3-6, and 6-9 km to 0-3, 0-6, and 0-9 km. Which is the correct one?

2. In the interpretation, some of the reflections are associated with different geological structures. However, the geological map does not provide any strike and dip information. Also, the profile, to the south, does not cross the Doda fault while in the interpretation one of the reflections is associated with the fault. In the conclusions, it is mentioned that this fault is only imaged in the first 2 km, while the chs4 (associated with the fault) is observed around 2–3 km depth. Are you sure that chs4 is the fault? In the text, it is not clear the origin of the diffractions. Is it the fault or a potential ore body?

3. It is possible to provide a geological model of the final interpretation? Which are the relationship between chn1 and chs1?

4. Can you provide the orientation of the seismic profiles in Figures 5–12? In Figure 7, why is represented 12 km, if only there are interpreted the first 6 km, why chn4-chn6 are not interpreted in this figure? Also, in Figure 10, the chn_diff seems not to agree on the shot gather and the stacked section.

5. In the text is mentioned that for DMO it is used a range velocity of 5000–6500 m/s, while for the CDMO is used a constant velocity of 5500 m/s. Why this decision was made, can you explain it further? In addition, in my understanding, a range of velocities, such as 5000–6500 m/s, will not be considered a constant velocity.

6. Some references are missing

In the attached file you can find all further comments related to the manuscript.

Please also note the supplement to this comment:

<https://se.copernicus.org/preprints/se-2020-155/se-2020-155-RC3-supplement.pdf>

Interactive comment on Solid Earth Discuss., <https://doi.org/10.5194/se-2020-155>, 2020.

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