

Response to Reviewer for:

**“Constraints on Fracture Distribution in the Los Humeros
Geothermal Field From Beamforming of Ambient Seismic Noise” Kennedy et al.**

Many thanks to the reviewer, for their detailed and constructive comments. We have implemented most of the suggestions, and for those that we did not implement we explain why below. Reviewer’s comments are in black plain text; our responses are in italics with increased indentation (specifications to lines and figures refer to the revised manuscript). In the revised manuscript we have marked all changes in red text.

Best wishes,
Heather Kennedy

Dear authors

This is a review for the manuscript 'Constraints on Fracture Distribution in the Los Humeros Geothermal Field From Beamforming of Ambient Seismic Noise'

I believe the manuscript is well presented and written and is worthy of publication as is. The only point I feel should be made is perhaps that the assumption 'seismic velocity is faster along orientation of a fault ...' merits more investigation, however I agree that it is beyond the current scope of the manuscript and should be explore in separate work.

I have included the pdf with a small number of minor comments, which are not critical but could perhaps be of use.

We thank the reviewer for your minor comments, all comments have been acted upon.

Best regards
Reviewer

Minor Comments

Line 45: first time acronym used in the text, specify meaning Los Humeros Volcanic Complex?
Brittle-ductile?

We thank the reviewer for pointing out this mistake and have added these acronyms in this first appearance (Lines 49-50).

Line 80: Instrument type?
Line 81: Instrument type?

We apologise for any confusion, the 45 3C stations are referring to the 25 broadband (22 Trillium C-120s and 3 Trillium C-20 PH) and the 20 short-period (Mark L-4C-3D) stations. We have made this clearer and included the instrument type for the SP stations (Line 142).

Line 111: Unable to find the supplementary materials
Line 122-123: Again mention of supplementay materials, perhaps the authors are referring to Appendices?

We agree this should be the appendices and not the supplementary materials, all mentions of supplementary materials have been changed to appendices or the appendix (Lines 175 and 186-187).

Figure 3a : difficult to observe the white circle encapsulating true h-wavenumber

We thank the reviewer for bringing this to our attention and have changed the figure fittingly (figure 4).

Figure 4: Is quite difficult to observe the bootstrap resampling curve, perhaps change the color or the line thickness.

Thank you for pointing this out, the figure has been changed accordingly (figure 5).

Figures 6 and 7: Text resolution in figures 6 and 7 could be improved

We thank the reviewer for pointing this out, the figure's text resolution has been improved accordingly (figures 7 and 8).

Line 229-230: Has there been any modeling done on this topic? I would be curious about certain cases in which faults zones are highly brecciated (slow velocity) for example.

Thank you for this observation. However, upon further investigation, there is a lack of modelling that has been done on this topic and the extent of velocity investigation in fault zones speaks of the low-velocity areas (low shear velocity) in the damage zone caused by faulting, around the faults themselves (Thakur et al., 2020).

References:

Thakur, P., Huang, Y. and Kaneko, Y., 2020. Effects of low-velocity fault damage zones on long-term earthquake behaviors on mature strike-slip faults. Journal of Geophysical Research: Solid Earth, 125(8), p.e2020JB019587.