

Solid Earth Discuss., referee comment RC2
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Comment on se-2020-216

Corentin Caudron (Referee)

Referee comment on "On the comparison of strain measurements from fibre optics with a dense seismometer array at Etna volcano (Italy)" by Gilda Currenti et al., Solid Earth Discuss., <https://doi.org/10.5194/se-2020-216-RC2>, 2021

General comments

I enjoyed reading this manuscript. It's very well written and the figures are overall clear.

My only major issue concerns the general objective of the paper. In the abstract, you present your experiment as a way to understand DAS potential to detect volcano-seismic signal. You insist on the great opportunity to probe its multi-faceted activity which is again very promising. But in the end, you only analyze a volcanic explosion and a LP, and rather focus on the capability to measure strain by an in-depth comparison with the more conventional broadband deployment. This is fair and, as mentioned, interesting scientifically. Yet, I'm finding the abstract and the conclusion slightly misleading. It would be interesting to know if you have detected tremor for example? I fully understand the idea of focusing on the capability to retrieve strain measurements at volcanoes, but would modify the abstract, introduction and conclusion accordingly.

Overall, as mentioned above, I'm very positive and have only several minor comments listed below.

Minor comments

27: suggest adding a comma: 'Nowadays, advances'.

27-30 : suggest adding references to support these statements and guide the readers.

L.35 : what do you mean by multifaceted ?

35 : again some references are needed for Etna volcanic activity

39 : as a non-native English speaker, I'm not sure about measures. I have always used measurements instead of measures. Worth checking this in detail.

46 : 'constraints on seismic sources' : could you be more specific here ?

52-53 : 'close sensors or dense arrays' : it would be good to give some numbers here, again to guide the non-seismologists who may be interested in your contribution

58 : 'the Authors'-> 'the authors'

L.90 : what's the natural frequency of the Trillium Compact

115-116 : how do you tune them ?

L.125 : odd : the size of the text suddenly increases

L.155 : it would be interesting to take a similar gauge length for the DAS to more directly compare with the broadband array

L.172 : the font size has again changed for some reason

L.183 : is that really giving a local estimate of their respective performance ? I have the feeling it somewhat highlight their discrepancy but not their performance.

L.189 : comment on Poisson's ratio value : how did you come to this conclusion ?

L.191 : I only partly agree. RMSE misfits are also much higher in the northern and southwestern sections. Could you comment on this ? But I agree with the fault zones.

L.194-195 : this sentence is not clear to me. What is your aim ? To assess DAS performance ? Why on irregular points ?

The first paragraph is very convincing. Well done.

207 : I suggest using 'coinciding with' rather than 'in correspondence'

L.220 : have you tried to compute simple H/V ratios for the broadband to better understand the site effects ?

Other questions

I would like to see a spectrum for each event before any filtering, perhaps as supplementary material.

There seems to be more phases excited following the VE compared to the LP. Could you comment on this ?

Figure 1 : strange geometry. Could you explain the rationale for selecting this geometry ? What is the DEM resolution ?

Figure 2 : I would suggest to avoid the use of jet colours for the colormap (<https://gorelik.net/2020/08/17/what-is-the-biggest-problem-of-the-jet-and-rainbow-color-maps-and-why-is-it-not-as-evil-as-i-thought/>).

I can't see the red line : 'DAS channel 501 (red line)'

Figure 4 : you should again mention here what are the open circles and black lines

Figure 6 : the green color is very hard to see

Figure 7 : any reason why there seems to be more scattering for some channels, e.g., 200 ? Any local amplification ?

Figure 8 : why are there some discrete lines around channels 600 and 300 for example ?