

Interactive comment on “A geophone-based and low-cost data acquisition and analysis system designed to microtremor measurements” by Ozkan Kafadar

Anonymous Referee #2

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In this paper the author presents a low-cost hardware and software Arduino-based device (MicDAC) designed for microtremor measurements and to provide horizontal-to-vertical spectral ratio analysis of the acquired signal. The paper is well organised but some revisions are needed before its publication.

My comments are given below:

1) Page 1, line 18: seismometers, geophones and accelerometers do not differ only for their natural frequencies and bandwidth but also for the physical observable that they are able to measure (ground motion velocity for seismometers and geophones; ground motion acceleration for accelerometers); furthermore, accelerometers are less

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sensitive than geophones and seismometers but, on the other hand, they are preferred for strong ground motion measurements. Therefore, I suggest to better describe here the different kind of seismic sensors.

2) Page 3, line 70: you should better justify why the usable band of the sensor is 0.2-240 Hz; probably, a figure showing the amplitude and phase response of the sensor would be a good addition.

3) Page 3, line 73: please provide some numbers when you say “low-cost hardware-software device”; e.g., less than one hundred euros or hundreds of euros or less than one thousand euros, etc. It is important for the reader to understand if your device is effectively a low-cost device.

4) Page 7, lines 142-145: I think that you should compare the amplitudes directly in physical units by applying the appropriate transduction constant for each device. In this way, you demonstrate that the signals are perfectly comparable also in terms of their amplitudes. Alternatively, another solution would be a comparison of their H/V functions; indeed, both the horizontal and vertical components should differ only for a constant value among the different devices.

Additional minor comments:

1) Page 2, line 36: substitute “that the proposed” with “since the proposed”.

2) Page 2, line 49: substitute “developed for analysis of” with “developed for the analysis of”.

3) Page 2, line 54: substitute “each selected time windows” with “each selected time window”.

4) Caption of Figure 1: substitute “abstract of proposed system” with “abstract of the proposed system”.

5) Page 5, line 97: please remove “(Fig. 4)” because you mention here Fig. 4 before

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Fig.3 and because Fig. 4 is principally useful to show the waveforms recorded by using a real sensor.

6) Page 5, line 110: substitute “The duration of the analyze process” with “The time duration of the analysis process”.

7) Caption of Figure 3: please refer in the figure to the first channel consistency test. For example you could write as follows: “Error percentage of difference signal estimated during the first channel consistency test.”

8) Caption of Figure 5: as already suggested for the caption of Figure 3, here you should refer to the second channel consistency test.

9) Figure 7a: waveforms are not well visible. I suggest to substitute the background color from black to white and to increase the width of lines.

10) Page 9, line 158: substitute “were used to analysis” with “were used for the analysis”.

11) Page 9, line 160: what do you mean with “bandwidth 40 was applied”? Do you mean the bandwidth coefficient b of the Konno-Ohmachi function? Please, specify what do you mean.

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