## Our responses are in red with new manuscript text in bold italics.

The manuscript "The effect of 2020 COVID-19 lockdown measures on seismic noise recorded in Romania" by Grecu and others analyze the seismic noise variation in seismic recordings from the stations of the Romanian Seismic Network, before and during the COVID-19 pandemic and lockdown periods.

Generally, the manuscript is well-written and easy to follow. The results are interesting, and, in my opinion, the manuscript can be published after some minor revisions.

## We thank the reviewer for his/her careful and detailed review and positive comments.

I have the following main questions:

1. Have you also considered frequency bands lower than 2 Hz? Is there a reason why you chose to start from 2-8 Hz frequency band?

The entire data set was also analyzed in the 0.5-1 Hz frequency band, both for broadband stations and accelerometers. In the case of broadband stations, we observed clear seasonal variations of seismic noise. In contrast, the results obtained for the accelerometers do not reveal any relevant seismic noise variation at these low frequencies. An example is given in Figure 1 below, for a station that has both broadband velocity and acceleration sensors. As it can be seen from these graphs, the long-term evolution of the seismic noise is very different for the two recordings.

The long-term seismic noise-variation obtained for acceleration and velocity sensors becomes comparable starting with frequencies higher than 1 Hz, as shown in Figure S1 in the supplementary material. These aspects, and the fact that most stations used in the analysis are equipped with the acceleration sensors, led us to limiting the analysed lower frequencies to 2 Hz.





Figure 1. long-term variation of the noise at VRI station for the broadband velocity (top) and accelerometer (bottom) sensors. Note the seasonal variation observed for the broadband sensor and no baseline noise changes in case of the accelerometer.

2. Have you detected signals related to weather conditions during the lockdown period? Maybe at those stations where the noise signal is low like the kindergarten station, just after the school's closure.

We did not look at such signals for stations in cities, this is mainly because we did not have access to the data from weather stations installed in the cities or close to our seismic stations to correlate with. However, when we looked to see if any earthquakes were recorded during the lockdown period, we checked the waveforms and didn't notice any unusual signals. For the MLR station, where we have a collocated weather station, we were able to observe a correlation between the increase in seismic noise and wind speed increase at certain periods of time (see Figure S2 in supplementary material).

3. Line 294: here you are considering the station deployed at the last floor of the hotel. So, aren't you observing a behaviour like in Figure 8, with different noise levels at different floors?

We observed partly the same behaviour as in Figure 8, i.e. an increase in the level of noise between the basement station (FOCR1) and the station deployed at the 4th floor (FOCR2). However, the difference in the noise levels between the station at the top of the building (FOCR3) and FOCR2 are less significant. In addition, the overall characteristics of the long-term noise variations are similar regardless of the floor at which the seismic station is located.

4. Figure 11b: Around August 2019 and October 2019, there is an increase in the noise level. Any thoughts/interpretations about these peaks?

The increase in the noise level you are referring to is observed during 4-8 July 2019 (186-189 Julian day) and 11-14 September 2019 (254-257 Julian day). We computed the spectrograms (Figure 2 below) for these time periods and noticed an increase in noise energy for frequencies higher than 15 Hz. This increase is seen only during the daytime and it is stronger for the station located at the 8th floor (FOCR3), while disappearing for the stations located in the basement (FOCR1). We can only speculate about what caused this increase in noise level

- most likely some works carried out on the upper floors of the hotel. Unfortunately, we have no conclusive data or information about such very local noise sources in the building.





Minor-technical points:

Overall, I suggest increasing the size of the font for the clock plots. Even enlarging, I still found it difficult to read letters and numbers.

We increased the size of the font for the clock plots.

Can you please add the holidays (e.g., Orthodox Easter) in those Figures where they are missing (like Figure 7)?

We added the missing labels (Easter, Christmas) to Figure 7 and Figure 11

Abstract, Line 9: March 2020

## Done

Line 325: typo, IT

Done