Comment on esurf-2022-41
Anonymous Referee #2

Referee comment on "Comparison of calibration characteristics of different acoustic impact systems for measuring bedload transport in mountain streams" by Dieter Rickenman et al., Earth Surf. Dynam. Discuss., https://doi.org/10.5194/esurf-2022-41-RC2, 2022

I very much enjoyed reading this manuscript on the calibration of various acoustic impact systems for measuring bedload transport. Given the challenges of obtaining bedload transport data, I believe this is an important topic for the discipline and the authors present results that are both scientifically interesting and practical. I believe this paper should be published given that some minor comments are addressed by the authors.

General Comments:

I am unsure what the purpose of the IQA measurements are – the authors should elaborate more on how this was used in the analyses.

In the methods section, the authors describe fitting both linear and power relations to the data, but only show results from the linear models subsequently. Is this because the power relations were not as strong? In this case, I would consider removing from the article or mentioning their inferior performance somewhere in the results.

Section 4.5 and the results of the SPS system seem to come out of the blue and are a bit awkward in my opinion to be presented here. I wonder if the authors consider placing this as a main objective, or at minimum introducing this system earlier.

Specific Comments:

Line 40: Remove the “this”
In Figure 1 it appears that the acoustic measuring systems are installed within a concrete liner – could the authors elaborate more on their installation? Is this the nature of the stream in this location, or is the concrete slab placed directly within the streambed?

How are the authors sure that the metal frames are robust against these forces? Are the previous studies or measurements confirming this?

Can the authors elaborate more on how they chose the recording frequency for each system?

Table 2: For units, is V = volts and g = ?

Check that A min is showing up correctly as a subscript.

Can the authors explain what the centroid frequency is?

Is this change in calibration relation also attributed to the change in the cable?

Is M shows here independently measured bedload mass?

In Figure 5b, it is difficult to distinguish the ‘before June 2016’ and ‘after June 2016’ points, particularly for the JPM system, for which it is important. I would consider using a different colour to make it more visible.

This is the first mention of this fixed rough bed upstream – I would like to see more elaboration on this set up.

I would choose either “generally” or “clearly” to simplify the sentence.
Figure 12: The authors should check to make sure the figure titles and axes labels show up without the spelling error red lines in this figure and in other figures (I believe the issue is in Figures 13 and 14 as well)

Line 346: No need for a comma after “occur”