

Earth Surf. Dynam. Discuss., referee comment RC1
<https://doi.org/10.5194/esurf-2021-28-RC1>, 2021
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Comment on esurf-2021-28

Anonymous Referee #1

Referee comment on "Genesis and propagation of exogenous sediment pulses in mountain channels: insights from flume experiments with seismic monitoring" by Marco Piantini et al., Earth Surf. Dynam. Discuss., <https://doi.org/10.5194/esurf-2021-28-RC1>, 2021

This study presents the results of a unique set of experiments to understand the formation mechanisms of sediment pulses in steep streams. The manuscript is very well written, and the quality of the measurements appear to be excellent. The study draws interesting connections with debris flows and reaches important conclusions on the interpretation of ground vibrations that will make the study of interest to a broad audience. I think one aspect of the study that could use more discussion is the periodicity of the sediment pulses. What sets the frequency of the pulses?

Additional minor comments by line number:

41: Consider also citing earlier work on this topic, like Wiberg & Smith, WRR, 1991

80: "however the extent to which they continue to apply to flows like sediment pulses remains to be investigated" True, but there are a number of studies, some of which you mention, that have applied those methods debris flows, which are an extreme form of a sediment pulse.

96: What is the slope of the upstream storage area, 0 %?

118: What is the sampling rate of the ultrasonic stage sensor?

177: Please elaborate on the process that triggers the reduction in transport capacity and new phase of aggradation.

179: How many aggradation/erosion phases do you typically see in a run? And how long is a typical run? Or, what is the period of each cycle?

179: "Erosion's intensity is characterized..." I do not follow this sentence.

181: "presence of sand and their percolation" Please clarify if you are referring to the percolation of the fine sand through the coarse material, or the percolation of water through the deposit. I think you mean the former, but the statement could be misinterpreted.

226: "Given the different genesis...." I do not follow this statement about why the second solid discharge is not considered a sediment pulse.

261: "the tail of the sediment pulse is back to a saltation dynamics" Please clarify. The sediment transport processes in the tail transition from what? to saltation.

296: "as water cannot infiltrate" Water can infiltrate sand. The addition of fine grain particles reduces the hydraulic conductivity.

299: referred to in the papers... Which papers? This paper? The sediment transport literature?

307: Could elevated pore pressures from contraction during motion also aid in "granular lubrication" like it does for debris flows?

315: I suggest omitting conclusions based on experiments that are not presented in this paper. If they are important observations for this study, shouldn't the experiments be included?

385: Please elaborate how your setup allows you to differentiate the source of the signal in a way that cannot be accomplished in the field. Would a seismic sensor very close to a natural channel have similar measurement capabilities as your laboratory setup?

Copy editing suggestions:

16 and elsewhere: one word, setup?

61: typo: and/or

66: much steeper slope than high-order rivers

146: "close to the unit", change to "close to 1"

163: in nearly total deposition

170: both processes, or both of the processes

178: delete "brutal"

181: rate of the process?

211: change "we advance" to "we hypothesize"

237: "On the opposite" On the opposite of what?

258 and 260: It is worth noting, That is why

303: does not allow us to estimate, we cannot draw conclusions about its

334: Over one century ago

References: Remove extra all caps text in some of the titles.