



EGUsphere, referee comment RC1
<https://doi.org/10.5194/egusphere-2022-1297-RC1>, 2023
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Comment on egusphere-2022-1297

Roland Kaitna (Referee)

Referee comment on "Debris-flow surges of a very active alpine torrent: a field database" by Suzanne Lapillonne et al., EGU sphere, <https://doi.org/10.5194/egusphere-2022-1297-RC1>, 2023

Lapillonne et al. report of results from a debris-flow monitoring station in the Real torrent and suggest a data processing protocol for a more consistent and transparent derivation of debris-flow parameters from field observations. I think this is a well-written and well-structured contribution that will be very valuable for the community.

I have only minor to moderate comments and suggestions:

L 1: "...debris flows" (plural)

L 5: "...at the surge scale" (instead of "at surge scale")

L 17: I think you refer here to the Nagl et al. (2022) paper (impact forces).

L 16: I think one should write "debris-flow monitoring", but "debris flow". Check throughout the manuscript to be consistent.

L 100-101: this sentence is unclear. Please re-formulate.

L 145ff: it is not clear to me, how these hypotheses will be tested. Probably it would be better to term them "assumptions".

Table 1: I recommend to add a column with the location along the channel (or distance between stations) and a column with the mean slope of the channel reach where stations are located. Both information may help with interpretations given later.

Figure 4: for the reader's convenience, I suggest to modify this figure for better readability: (1) the labeling is not intuitive and not consistent with labeling in Figure 5. E.g., why is flow stage termed "rad"? What is geo_21 and geo_21ref? (2) change line color/style to allow an easier differentiation between seismic sensors and flow state. You may also consider to plot diagrams above each other (makes them wider and probably easier to read) or show only one.

L 169: what is meant with "the least noisy flow stage signal is chosen"? Please re-formulate.

L 172: bracket is missing.

L 204: Delete “Finally,”

Section 3.2: it is not clear to me which type of base level change was used (see L 145ff). Did you compare different assumptions? Are the differences small compare to e.g. peak flow?

L 210: write “literature”, not “litterature” throughout the manuscript.

L 212: I recommend to stay more general and replace “viscosity” with “mixture composition”, that’s safer.

L 234: unclear sentence. Please re-formulate.

L 248: unclear. What do you mean by “witnesses”.

Section 4.3: I encourage to add some interpretation of the observations and measurements with regard to channel slope at the stations and distance between stations. E.g., is deposition to be expected at flatter reaches between stations?

Figure 10: I am wondering other symbols color may help to make the time component more readable. Probably grey-scale increasing over time?

Figure 11: can you add the range of uncertainty from volume and peak discharge estimates (assumptions on base level changes, L 145ff) to the diagram? In the Figure caption you may write “debris-flow surge volume”.

Nagl, G., Hübl, J., & Kaitna, R. (2022). Stress anisotropy in natural debris flows during impacting a monitoring structure. *Landslides*, 19(1), 211–220.
<https://doi.org/10.1007/s10346-021-01779-2>