

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC1
<https://doi.org/10.5194/nhess-2021-352-RC1>, 2022
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Comment on nhess-2021-352

Martin Mergili (Referee)

Referee comment on "Variable hydrograph inputs for a numerical debris-flow runout model" by Andrew Mitchell et al., Nat. Hazards Earth Syst. Sci. Discuss.,
<https://doi.org/10.5194/nhess-2021-352-RC1>, 2022

This manuscript analyzes the influence of variabilities in hydrograph input on the dynamics and impact areas of debris flows. The work covers an essential aspect of debris flow research, and represents a substantial step forward when it comes to our ability to analyze the uncertainties of debris flow simulation results, a highly important aspect when using such results for risk management purposes.

The manuscript is very well written, structured, and illustrated. I would certainly like to see this work published. I have no major comments, but I would like to place two minor, though still important, suggestions:

- Whereas it is fine to have Fig. A-1 in the Appendix, I strongly recommend to add a work flow figure to the main text, relating the different steps done with the different hydrographs (triangular, Swiss/Austrian sites, BC sites) for different purposes. In my opinion, this would substantially enhance the clarity of the concept.
- In order to enhance clarity for the readers, I also suggest to add a reference to Section 3 at the beginning of section 2.4, and to briefly mention the names of the three debris flow sites used. When reading this part of the manuscript for the first time, I had some difficulty to follow the logics (even though everything was clear when I read it for the second time).