Earth Surface Dynamics Discussions

Earth Surf. Dynam. Discuss., referee comment RC1
https://doi.org/10.5194/esurf-2022-70-RC1, 2023

Comment on esurf-2022-70

Louise M. Vick (Referee)

Referee comment on "Shape still matters: Rock interactions with trees and deadwood in a naturally disturbed forest uncover a new facet of rock shape dependency" by Adrian Ringenbach et al., Earth Surf. Dynam. Discuss.,
https://doi.org/10.5194/esurf-2022-70-RC1, 2023

This paper represents an important dataset which expands the existing data on the performance of rock shape and size in differing forest conditions. The presentation of this paper will greatly further rockfall understanding and simulation accuracy, a vital step in the development of natural hazards science.

The data itself is well presented and straightforward, and the discussion summarises the work nicely. However the early stages of the paper create some confusion in terms of focus and methodology.

While the title leads readers to believe the paper focuses predominantly on rock shape, this is quite a small part of the experiment and results. Rock size/mass is the more varied input, and the text itself focuses mostly on forest. Additionally, in the introduction, rock shape is only mentioned in the last few lines with only one reference providing the necessary background for shape understanding. I would suggest revising the title slightly in order to not mislead the reader.

There was no introduction to some other key components. For example, soil moisture and its effect on rockfall runout is not mentioned, despite being part of the data collection. RAMMS and the way it simulates rockfall (this seems to have guided the data collection methodology, so it is important) is also not mentioned.

The text confused me most in the experiment design section. Having published rockfall experiment design myself I can appreciate the difficulty of communicating all the variables clearly. Can the authors clarify this section? In particular what the exact two different shapes are, and what they mean by ‘tree mass classes’. The total of 106 rocks is the total events, or total number of individual rock samples used? How many rock samples did they

use, and how many repetitions of each were performed? Later in the text (L190) there is a mention of 13 trajectories. Where does this number come from?

Minor comments:

Can the authors define early on what is meant by deadwood in this particular case- trees which have died but remain fully standing, or trees which are broken?

Figure 1a. Why are the green points not displayed according to size like the blue?

L182: How is this consideration threshold derived?

L183-4: What is a root plate and what is the purpose of this step?

L191: How were these parameters calibrated? What field data went into this?

L201: Does MDH mean resting elevation of the block? Unclear

L311: How can it be a pattern and also not statistically significant?

F9: What are the white lines crossing the slope?

L482: This is untrue. See for example https://doi.org/10.5194/nhess-19-1105-2019