

Interactive comment on “Brief Communication: Measuring Rock Decelerations and Rotation Changes During Short Duration Ground Impacts” by Andrin Caviezel and Werner Gerber

F. Noël (Referee)

francois.noel@gmail.com

Received and published: 13 June 2018

It's been a pleasure to read this very interesting work. Working with instrumented blocks will help understanding the complex behaviour of falling blocks when they interact with the ground, and your work gives a good overview of this.

Specific comments:

- On p.2 line 19: “The measurements reveal the limits of field analyses”, This requires a comparison, or at least a mention of what is missing with actual field analyses compared with the proposed method in the core section of the document (eg. in discus-

C1

sion).

- The last paragraph of the conclusion section can't be written as an important conclusion of the work if its content is not shown in method/result/discussion. Coefficient of restitution (COR) is only mentioned once in the introduction, and vaguely described. Also, it is the result of the complex particle-soil interaction that happens at impact; so technically, COR might be compatible with your work if determined from the interaction of rock geometry, surface roughness... Where there might be an issue, is estimating jump altitude and runout with constant COR. But to conclude about that, it would need comparison, or at least more detail about COR. For now, I suggest the last paragraph to be modified or removed.

Here is a list of small technical corrections or improvement I suggest:

- On p.1 line 10: form -> from

- On p.3 line 10: a sphere of what material/density?

- On p.3 line 17: adding the equivalent of 4000°/s in SI (rad/s) should be considered, turn/s could be also interesting.

- On 2.2 Sensor section, the sampling rate of 400 Hz and 487.5 Hz should be mentioned (this is more a methodology characteristic than a result).

- The term “central acceleration” should be switch to “centripetal acceleration” or “radial acceleration”, and/or maybe previously described, eg. “acceleration felt due to an offset with the center of mass of the block when the particle is rotating”.

- On p.3 line 31: Only if there is an offset with the sensors and the center of mass... Higher acceleration values.

- On p.4 Fig. 1 d) description: Specify what are the mean acceleration values (white dots I suppose).

- On p.4 line 1: I think adding “During free fall, the rotational velocities... ”

C2

- On p.4 line 5: The last sentence could be removed because g acceleration isn't perceived by the accelerometers during free fall (so it works as well with vertical rotation).

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2018-89>, 2018.