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Interactive comment on "Rarefied particle motions on hillslopes: 2. Analysis" *by* David Jon Furbish et al.

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2) Analysis :

The second companion paper present results from an experimental study of particle travel distances down a slope, launched by a catapult system. Data is compared to previous experiments and field studies in an exhaustive manner and tested again the theoretical elements provided in the first companion paper (e.g. the expected Pareto distribution of travel distances). Data is well presented and well detailed so that I believe the 2nd study can be published within minor changes.

First, I do not exactly see why high speed imaging is used apart from determining launched velocity. Indeed, all the results shown in Figures present travel distances that

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Discussion paper

can all be determined without video.

Second, I am not sure to understand how the Pareto fits to the experimental distributions are obtained : by fitting the Pareto parameters, or by estimating them independently with high speed imaging (such as the \beta_z collision restitution parameter) ? I believe the theory would prove very robust if all parameters could be estimated independently via imaging (or other technique). This point is not clear enough and I would suggest the authors to clarify this while presenting their experiments.

Third, it is somewhat disappointing not to see any particle trajectory plotted, that would show the 'heating' (acceleration) for steep slopes, or 'cooling' for milder slopes. I believe much information can be extracted from an acceleration / velocity diagram, as was done for bedload transport in the authors' 2012 paper serie.

Other comments: Fig 9 and 10 (and maybe others) : recall what is \beta_z in the caption so that each figure is understandable by itself.

Please also note the supplement to this comment:
https://esurf.copernicus.org/preprints/esurf-2020-99/esurf-2020-99-RC1-supplement.pdf

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