

Abstract Submitted
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Collapse of a brittle granular column: implications for rock fragmentation in a landslide VINCENT LANGLOIS, Universite Claude Bernard Lyon 1, AMELIE QUIQUEREZ, Universite de Bourgogne, PASCAL ALLEMAND, Universite Claude Bernard Lyon 1 — We investigate numerically the failure, collapse and flow of a brittle granular column over a horizontal surface. In our discrete element simulations, spherical particles are initially held together by tensile bonds, which can be irreversibly broken during the collapse. This leads to dynamic fragmentation within the material during the flow. Compared to what happens in the case of a non-cohesive granular column, the deposit is much rougher, and the stratigraphy of the column is not preserved during the collapse. As has been observed in natural rockslides, we find that the deposit consists of large blocks laying on a basal layer of fine fragments. The influence of the aspect ratio of the column on the run-out distance is roughly the same as in the granular case. Finally, we show that for a given aspect ratio of the column, the run-out distance is higher when the deposit is highly fragmented, which confirms previous hypotheses by Davies et al. (1999).

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