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The effect of particle shape in the collapse of a granular column

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Some previous experiments on the collapse of a granular column have reported that the shape of the grains has little influence in the collapse process and the shape of final deposit. In contrast, other studies indicate that the flow of long grains has a very different behavior than that of simple grains. To investigate this apparent discrepancy, we performed Discrete Element (DE) simulations of the collapse of 2D granular columns under the action of gravity. In contrast to similar previous investigations, we consider elongated grains formed by constraining several individual particles on a straight line. The main parameter used to describe the final state of the deposit is the aspect ratio, a , of initial height (H_0) to initial radius (R_0) of the column ($a = H_0/R_0$). We have performed simulations using 2000 elongated grains with length/width ratios up to 5, varying the value of the initial aspect ratio to characterize different flow regimes and the final deposit, and compare with the monodisperse case. Preliminary results indicate that the grain geometry has a significant influence on the collapse of the column.

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