

Supplementary Material for: “Erosion of cohesive grains by an impinging turbulent jet”

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SUPPLEMENTARY VIDEOS

The snapshots in figure 7 in the main article are extracted from three videos available in supplemental materials:

- (1) Figure 7(a): “Movie1_Co=0_Uj=11ms.avi”: erosion of cohesionless grains ($b = 0$ nm; $Co = 0$) with $U_J = 10.87$ m s⁻¹;
- (2) Figure 7(b): “Movie2_Co=7.5_Uj=22ms.avi”: erosion of cohesive grains ($b = 106$ nm; $Co \approx 7.5$) with $U_J = 21.73$ m s⁻¹;
- (3) Figure 7(c): “Movie3_Co=15_Uj=30ms.avi”: erosion of highly cohesive grains ($b = 310$ nm; $Co \approx 15$) with $U_J = 30.43$ m s⁻¹.

All videos were recorded at 1000 fps using a Phantom high-speed camera (VEO 710L B&W). To highlight the erosion process in video form, videos provided here were re-compiled at 25fps, giving us movies slowed down 40 times compared to the original speed. To simplify imaging, the velocity at the nozzle of the jet was taken larger than the velocity at the threshold of erosion, *i.e.*, $U_J > U_J^*$. In all cases, the granular surface was a distance 6 cm from the outlet of the nozzle ($H/D = 12.5$), and the diameter of the grains used was $d_g = 650$ μ m. The movies correspond to the erosion process for three different cohesions (given by the cohesive number Co) and different velocities at the outlet of the nozzle U_J .

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