

Abstract Submitted  
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**The effect of volume fraction on granular slope stability** NICK GRAVISH, School of Physics Georgia Tech, NICK WARD, Augsburg College, DANIEL I. GOLDMAN, Georgia Tech — We study the stability of granular slopes as a function of the prepared volume fraction  $0.58 < \phi < 0.62$ . A bed of  $250\mu\text{m}$  diameter glass beads with an initial slope angle  $\theta=0^\circ$  and initial  $\phi$  is slowly rotated at constant angular velocity to a final angle of  $50^\circ$ . We monitor the motion of grains at the top surface and observe that the angle at which continuous surface flow occurs is sensitive to  $\phi$  and increases from  $\theta_0 \approx 26^\circ$  at low  $\phi$  (loosely packed) to  $\theta_0 \approx 32^\circ$  at high  $\phi$  (closely packed). Prior to the uniform failure at  $\theta_0(\phi)$  the grain motion during tilting differs between the loosely packed to the closely packed regimes. Tilting loosely packed beds results in rapid intermittent grain rearrangement at the surface; the angle at which these begin is  $\theta \approx 15^\circ$ . In the closely packed beds grain motion at the surface is not observed until  $\theta \approx 31^\circ$ , prior to continuous failure.

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