

Abstract Submitted
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Failure of Granular Slopes under Vibration GREG VOTH, DOUG RUBIN, NAOMI GOLDENSON, Wesleyan University — We report experimental measurements of the stability of a granular slope under external vibration. A 3D layer of glass beads is inclined and subjected to sinusoidal horizontal acceleration that continuously increases in amplitude. Video imaging of the upper surface of the slope provides sensitive detection of the onset of motion. For a wide range of inclination angles, even above the dynamic angle of repose, initial failure is transient: flow allows the material to find a stronger static configuration which then requires a higher acceleration to initiate the next failure. Measurements show a clear dependence of the acceleration at failure on the rate at which the acceleration increases, revealing microscopic strengthening before the onset of detectable bead motion.

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