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Avalanche Dynamics and Angle of Repose of a Cohesive, Conical Bead Pile DAVID MORROW, SUSAN LEHMAN, The College of Wooster — Slip avalanches on a slowly driven pile are investigated experimentally using a 3D conical pile built from uniform 3 mm steel beads. Beads are added to the pile by dropping them onto the apex one at a time; avalanche size is measured through changes in pile mass. To better understand the dynamic motion of individual avalanches, we investigated the changes in the angle of repose of the bead pile. By adding a uniform magnetic field from a set of Helmholtz coils, we are able to control the cohesion between the beads. Measurements of the change in angle of repose caused by large avalanches were taken at three different cohesion levels. The change in angle of repose was studied as a function of both the size of the avalanche as well as the cohesion of the pile. We find that increased cohesion tends to also increase the change in the angle of repose, even comparing avalanches of the same size. To further understand the avalanche dynamics, we use video analysis of the surface of the pile to characterize the surface activity of the pile. The relationship between the surface activity of an avalanche and the change in the angle of repose is under investigation.

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