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Stability of Binary Granular Mixtures[1] ADRIAN SWARTZ, JEREMY OLSON, J. BRYCE KALMBACH, RENA ZIEVE, University of California, Davis — We study stability of a binary granular mixture. The two grain types are spherical ball bearings, and hexagonal shapes created by welding seven of the spheres together. The shapes are confined to a two-dimensional drum, which rotates slowly enough for discrete avalanches to occur. On average homogeneous piles of hexagonal reach a higher angle before an avalanche than homogeneous piles of spheres, by nearly twenty degrees. As the concentration of spheres is increased in a pile of mostly hexagons, the stability angle decreases more than twice as fast as expected by a linear interpolation between the homogeneous values. The spheres also tend to clump in the middle of the drum, and this segregation appears to cause the nonlinearity in angle. This indicates that the central portion of the drum is the most important in triggering avalanches.

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