

Abstract Submitted
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Friction on a granular-continuum interface: Effects of granular media¹ ROBERT ECKE, DREW GELLER, Los Alamos National Laboratory — We consider the frictional interactions of two soft plates with interposed granular material subject to normal and shear forces. The plates are soft photo-elastic material, have length 50 cm, and are separated by a gap of variable width from 0 to 20 granular particle diameters. The granular materials are two-dimensional rods that are bi-dispersed in size to prevent crystallization. Different rod materials with frictional coefficients between $0.04 < \mu < 0.5$ are used to explore the effects of intergranular friction on the effective friction of a granular medium. The gap is varied to test the dependence of the friction coefficient on the thickness of the granular layer. Because the soft plates absorb most of the displacement associated with the compressional normal force, the granular packing fractions are close to a jamming threshold, probably a shear jamming criterion. The overall shear and normal forces are measured using force sensors and the local strain tensor over a central portion of the gap is obtained using relative displacements of fiducial markers on the soft elastic material. These measurements provide a good characterization of the global and local forces giving rise to an effective friction coefficient.

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