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Dense granular flows down an inclined plane ROBERT ECKE, TAMAS BORZSONYI[1], Los Alamos National Laboratory — Granular flow on a rough inclined plane is an important model system in which to study the basic rules of the dynamics of granular materials. Despite intensive study, many features of such flows are still incompletely understood. For uniformly flowing layers at relatively shallow inclination, we consider experimentally the the basic flow rheology of the granular media and propose new scalings to collapse our data for glass beads and rough sand as a function of inclination angle and particle diameter. At steep inclinations above some angle θ_s ($\tan\theta_s/\tan\theta_r \approx 1.3-1.5$, where θ_r stands for the angle of repose) for flowing grains, numerics and theory predict that the surface roughness is inadequate to dissipate energy gained in the gravitational field, and the flow should continue to accelerate. We report on our experimental results on the properties of granular flows on a steeply inclined plane and define the domains of steady flows. We also discuss the instabilities of such flows leading to spatial patterns.

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