Experimental study of the forced silos discharge process

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Hourglass discharge dynamics is a canonical example of complex granular matter behavior. The mass-flow rate independence on the height of the material remaining in the container has been profusely explored, but no theoretical approach adequately explains this phenomenon. Hoping to bring more information about this counterintuitive observation, we implement a simple experiment: a piston pushing the material discharging from a vertical silo. Under these conditions, we measure the radial distribution of the normal stress on the silo bottom and, simultaneously, the piston position and weight of material discharged. Furthermore, we investigate different piston weights and silo widths. As a result, we can correlate the influence of the stress distribution on the base with the increase in the mass flow rate reported in recent works for these forced discharge processes. Moreover, preliminary observations suggest the existence of a universal *dynamical* radial distribution function of the vertical stress on the base.