

Abstract Submitted
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Oil in Water Emulsion Flow in a 2D Hopper¹ XIA HONG, DANDAN CHEN, KENNETH DESMOND, ERIC WEEKS, Physics Dept., Emory University — Granular flows are still somewhat poorly understood. One such case is the flow of 2D disks through a hopper. In a prior experiment by To (K. To, et al. PRL 86(1) 2001), they found that as 2D disks flow through a hopper they may jam due to arch formations at the hopper exit, and that the jamming probability can be increased by enhancing the static friction between the disks. In our study we remove the effects of static friction by using quasi-2D oil in water emulsion droplets flowing through a hopper to understand the role of friction in jamming. The droplets feel a viscous friction, but no static friction. Similar to the granular experiment, our oil droplets flow due to gravity. We have observed the transition between jammed and unjammed flows in our setup, and we are currently investigating its nature as the hopper size changes. In our experiments, jamming seems to occur only for very small hopper openings, and arches are always unstable.

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