Abstract Submitted
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Fluctuations for Hopper Flow with Circular and Elliptical Particles[1] JUNYAO TANG, Duke University — Recent studies have shown the importance of particle-scale fluctuations in granular flow, e.g. "stick-slip" and jamming. In this talk, we consider 2-D hopper flow, where we investigate how the mean and fluctuations of stress, velocity and density fields depend on hopper geometry (e.g. opening size and wall angle) and material properties (e.g. particle shape and initial filling height of materials). A particularly interesting observation is that the mean stress is a decreasing function of the filling height, even though the flux is nearly constant over the same range of material heights. We also find strong negative correlations between stress and velocity fluctuations. Also of interest is the effect of the particle orientation in the flow of elliptical particles. Related MD/DEM studies (supported by IFPRI and NSF) by Shattuck, Kondic and McCarthy et al. have found that good agreement between models and experiments for these flows.

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