

Abstract Submitted
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Shearbanding Instability and Patterns in Granular Shear Flows

PRIYANKA SHUKLA, MEHEBOOB ALAM, J.N.Centre for Advanced Scientific Research, Bangalore — When a (dense) granular material is sheared in shear-cell experiments, shearing remains confined to a narrow localized zone (“shearband”) near the moving boundary. Such shear-banding has also been realized in the molecular dynamics simulations of granular plane Couette flow for a range of densities (even without gravity) in the rapid flow regime. In this talk I will present the shear-banding instability of granular shear flow via an order parameter equation.

[1] Weakly nonlinear theory of shear-banding instability in granular plane Couette flow: analytical solution, comparison with numerics and bifurcation, Priyanka Shukla and Meheboob Alam, *Journal of Fluid Mechanics* 2010, **665**, p. 1-50.

[2] Landau-type order parameter equation for shear banding in granular Couette flow, Priyanka Shukla and Meheboob Alam, *Physical Review Letters*, **103**, 068001, 2009.

[3] Universality of shear-banding instability and crystallization in sheared granular fluid, Meheboob Alam, Priyanka Shukla and Stefan Luding, *Journal of Fluid Mechanics*, **615**, p. 293-321, 2008.

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