MAR13-2012-000943

Abstract for an Invited Paper
for the MAR13 Meeting of
the American Physical Society

Simulations of shear-induced jamming in athermal particulate systems[1]

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We perform simulations of athermal particulate systems that are prepared in unjammed states with zero static shear modulus and then subjected to successive pure or simple quasistatic shear strains at either fixed packing fraction or fixed pressure. In response to applied shear, these systems jam, forming anisotropic networks of interparticle contacts. We determine the onset of shear-induced jamming as a function of the amplitude of the shear strain, packing fraction, pressure, and system size. We find that the parameter space for shear-induced jamming expands for particles with frictional interactions and nonspherical shapes.

[1]NSF DMR-1006537