

Abstract Submitted
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Local anisotropy in globally isotropic granular packings KAMRAN KARIMI, CRAIG MALONEY, Carnegie Mellon University — We study local stresses and elastic moduli defined at various coarse-graining scales, R , and volume fractions, ϕ , in a two dimensional (2D) mixture of frictionless granular particle packings. We measure the average deviatoric stress normalized by pressure, τ/p , and normalized anisotropic component of the shear modulus, $\delta\mu/\mu$, as a function of R . As the packings are prepared isotropically, both τ/p and $\delta\mu/\mu$ vanish at large R . However, in local regions, where single force chains dominate, the response can be quite anisotropic. We show that τ/p exhibits two power-law regimes in R with a cross-over that is only weakly dependent on ϕ . In contrast, $\delta\mu/\mu$, behaves like a pure power law up to $R \sim 640D$ (where D is the characteristic particle diameter) at all ϕ .

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