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Diffusion in linearly sheared granular packing JOSHUA DIJKSMAN, JIE REN[1], ROBERT BEHRINGER, Duke University — We study shear-induced diffusion in a linearly sheared, dense disordered packing of frictional photoelastic disks. We can track both displacements and rotational motion, and measure interparticle forces obtained from the photoelastic response of the disks. In these experiments, volume fraction and shear amplitude are the control parameters. We probe the non-affine displacements, both in the transient of a single shear deformation, and during cyclic shear. We observe fine structure in the nonffine displacement fields and find that the diffusion anisotropy shows nontrivial dynamics. Additionally, we find that both rotational and translational diffusion increases with density for all but the highest densities.

[1]Currently at Merck & Co.

Joshua Dijksman
Duke University

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