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Shear-Induced Diffusion of Cubic Colloids STEVEN HUDSON, JOHN ROYER, NIST, DANIEL BLAIR, Georgetown University — Particles in many industrially relevant fluid suspensions have directional or anisotropic interactions, yet it is not understood how these interactions influence particle self-association or the rheology of a suspension. We therefore use confocal rheometry to study simultaneously the micro-scale particle motion and macro-scale rheology of a model colloidal suspension. Specifically, we study mono-disperse, hollow, silica cubes exhibiting well-characterized, well-controlled and tunable directional interactions. Tracking the 3-D position and orientation of the cubes as they move under steady shear, we characterize the packing structure and shear-induced diffusion of the cubes varying the shear rate, packing density, and depletion-induced attraction.

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