Self-diffusion in bulk sheared granular materials ANDREEA
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Clark University — We will discuss the diffusion and structural properties of granular particles in the bulk of a cyclically sheared three dimensional rectangular cell.
The particles are visualized away from the side walls using a fluorescent refractive
index matched interstitial fluid. Previous studies have shown that the diffusion is
anisotropic with respect to the vorticity plane, but these results have been confined
to either two dimensional systems or small three dimensional systems where the
boundary effects could not be decoupled. In a cyclic shear cell, the packing fraction
the particles and their orientational order vary smoothly over time. The particle
positions are identified and tracked over long durations to obtain particle diffusivity,
mean-squared displacements and probability distributions of particle displacements.
An analysis of the effect of structural order on the motion of the particles will be
presented.

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