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Three Dimensional Tracking of Two-Particle Dispersion in a Turbulent Jet STEPHANIE PAUSTIAN, CHIN HEI NG, ALBERTO ALISEDA, ME Department, University of Washington — We present experimental measurements of two-particle dispersion in a turbulent shear flow. The baseline flow is a well-characterized high Reynolds number (up to approximately 200,000) turbulent submerged round jet. Injection is performed in the self-similar part of the jet, where careful PIV measurements of the mean flow field and turbulent second order moments have been obtained and validated against theory and other experiments. Three-dimensional tracking of two particles, injected simultaneously at two different radial or axial positions in the jet, is obtained from two-camera high-speed shadowgraphy. The influence of mean shear and turbulence fluctuations on dispersion is analyzed for initial positions where a mean velocity shear is superimposed on turbulent fluctuations. Injection of different particles, liquid droplets and gas bubbles is performed to analyze the influence of density ratio, particle inertia and buoyancy on the dispersion ratio. The versatility of the experimental facility also allows for the experimental investigation of the Reynolds number effect on dispersion, ranging from below the mixing transition (approximately 3,000) to very high values (>100,000).

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