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**Comparison of Stochastic Theory and DNS for the Relative Motion of High-Inertia Particle Pairs in Isotropic Turbulence** SARMA RANI, ROHIT DHARIWAL, Univ of Alabama - Huntsville, DONALD KOCH, Cornell University — In an earlier work, we derived closures in the limit of high Stokes number for the diffusivity tensor in the PDF equation for particle pairs. The diffusivity contained the time integral of the Eulerian two-time correlation of fluid relative velocities seen by pairs that are nearly stationary. The two-time correlation was analytically resolved through the approximation that the temporal change in the fluid relative velocities seen by a pair occurs principally due to the advection of smaller eddies past the pair by large scale eddies. Two diffusivity expressions were obtained based on whether the pair center of mass remained fixed during flow time scales, or moved in response to integral-scale eddies. A quantitative analysis of the stochastic theory is performed through a comparison of the pair statistics obtained using Langevin simulations with those from DNS. Langevin simulations of particle pair dispersion were performed using the diffusivity closures for four particle Stokes numbers based on the Kolmogorov time-scale,  $St_\eta = 10, 20, 40, 80$  and at two Taylor micro-scale Reynolds numbers  $Re_\lambda = 76, 131$ . Statistics such as RDF, PDF, variance and kurtosis of particle-pair relative velocities were computed using both Langevin and DNS runs, and compared.

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