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Experimental drag histories of shock accelerated micrometer sized particles GREGORY ORLICZ, ADAM MARTINEZ, KATHY PRESTRIDGE, Los Alamos Natl Lab, EXTREME FLUIDS TEAM — The horizontal shock tube facility at Los Alamos is used to investigate the drag forces on micrometer sized particles dispersed in air when they are accelerated by a shock. Eight-frame, high-speed particle tracking velocimetry/accelerometry (PTVA) diagnostics are implemented to measure the trajectory of individual particles with high spatial and temporal resolution, and a shadowgraphy system is used to measure the shock location. We will present experiments covering a range of Mach numbers, particle sizes, and particle densities, to explore the drag forces on both solid particles and liquid droplets. Results are compared to those predicted by the quasi-steady drag correlation and other empirical unsteady drag models. Estimations of the drag coefficients are found to be significantly higher than the models predict for solid spherical particles. Measurements at this facility will be used to further develop and validate models for unsteady drag.

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