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**First particle acceleration measurements for a shocked multiphase flow at a new horizontal shock tube facility** GREG ORLICZ, ADAM MARTINEZ, KATHY PRESTRIDGE, Los Alamos National Laboratory, EXTREME FLUIDS TEAM — The horizontal shock tube at Los Alamos, used for over 20 years to study shock-driven mixing between different density gases, has been retrofitted with a new particle seeding system, test section, and diaphragmless driver to investigate the unsteady forces on particles as they are accelerated by a shock wave. Current experiments are performed to measure the acceleration of dispersed glycol droplets, with nominal 0.5 $\mu$m diameter, carried in ambient air. Measurements at this facility will be used to develop and validate empirical models implemented in numerical codes. A Particle Image Velocimetry/Accelerometry (PIVA) system is implemented at the facility using eight laser pulses and an eight-frame high speed camera. The lasers are 532 nm Nd:YAGs with pulse widths of 20 ns, and the camera is a Specialised Imaging SIMD with 1280x960 resolution at up to 7 million frames per second. With this PIVA arrangement, eight particle fields are collected by independently varying the interframe times. Seven velocity and six acceleration fields are used to study the unsteady drag on the particles. Initial data sets are with a size distribution of known particle diameters. Plans are to vary the particle/gas density ratio, particle diameters, and particle phase (liquid/solid).

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