Abstract Submitted
for the DFD16 Meeting of
The American Physical Society

**Time-resolved particle image velocimetry measurements of the 3D single-mode Richtmyer-Meshkov instability** QIAN XU, VITALIY V. KRIVETS, EVEREST G. SEWELL, JEFFREY W. JACOBS, Univ of Arizona — A vertical shock tube is used to perform experiments on the single-mode three-dimensional Richtmyer-Meshkov Instability (RMI). The light gas (Air) and the heavy gas ($SF_6$) enter from the top and the bottom of the shock tube driven section to form the interface. The initial perturbation is then generated by oscillating the gases vertically. Both gases are seeded with particles generated through vaporizing propylene glycol. An incident shock wave ($M \approx 1.2$) impacts the interface to create an impulsive acceleration. The seeded particles are illuminated by a dual cavity 75W, Nd: YLF laser. Three high-speed CMOS cameras record time sequences of image pairs at a rate of 2 kHz. The initial perturbation used is that of a single, square-mode perturbation with either a single spike or a single bubble positioned at the center of the shock tube. The full time dependent velocity field is obtained allowing the determination of the circulation versus time. In addition, the evolution of time dependent amplitude is also determined. The results are compared with PIV measurements from previous two-dimensional single mode experiments along with PLIF measurements from previous three-dimensional single mode experiments.

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Date submitted: 01 Aug 2016 Electronic form version 1.4