Abstract Submitted
for the DFD16 Meeting of
The American Physical Society

Simulations of the Richtmyer-Meshkov Instability with experimentally measured volumetric initial conditions KEVIN FERGUSON, EVEREST SEWELL, VITALIY KRIVETS, The University of Arizona, JEFFREY GREENOUGH, Lawrence Livermore National Laboratory, JEFFREY JACOBS, The University of Arizona — Initial conditions for the Richtmyer-Meshkov instability (RMI) are measured in three dimensions in the University of Arizona Vertical Shock Tube using a moving magnet galvanometer system. The resulting volumetric data is used as initial conditions for the simulation of the RMI using ARES at Lawrence-Livermore National Laboratory (LLNL). The heavy gas is sulfur hexafluoride (SF6), and the light gas is air. The perturbations are generated by harmonically oscillating the gasses vertically using two loudspeakers mounted to the shock tube which cause Faraday resonance, producing a random short wavelength perturbation on the interface. Planar Mie scattering is used to illuminate the flow field through the addition of propylene glycol particles seeded in the heavy gas. An *M=1.2* shock impulsively accelerates the interface, initiating instability growth. Images of the initial condition and instability growth are captured at a rate of 6 kHz using high speed cameras. Comparisons between experimental and simulation results, mixing diagnostics, and mixing zone growth are presented.

Kevin Ferguson
The University of Arizona

Date submitted: 31 Jul 2016 Electronic form version 1.4