Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

**Experimental study of Mach number effects on the evolution of Richtmyer-Meshkov instabilities** RICARDO MEJIA-ALVAREZ, BRANDON WILSON, ALEX CRAIG, KATHY PRESTRIDGE, Los Alamos National Laboratory — The evolution of Richtmyer-Meshkov instabilities from the initial linear growth stages, to the subsequent non-linear interactions and the eventual (sometimes elusive) transition to turbulence, is strongly dependent on a number of factors such as shock strength (Mach number), Atwood number, and the initial structure of the fluid interface. Mach number controls the effective value of the Atwood number after compression, and thus the distribution and total amount of kinetic energy deposited at shock interaction. The initial scale-content in the fluid interface defines how quickly and to what extent growing instabilities interact with each other, ultimately conditioning transition to turbulence. These effects are not entirely independent of each other, and the extent of their relative importance is not well understood. To shed light on this subject, we designed a parameter space consisting of three different Mach numbers (1.1, 1.3, and 1.45) and three different interface configurations of varying scale content. This parameter space is being explored experimentally by means of simultaneous PIV/PLIF measurements on a single air-$SF_6$ interface as it evolves after shock interaction. This talk will focus on the observation of Mach number effects for an early stage of evolution.

Ricardo Mejia-Alvarez
Los Alamos Natl Lab

Date submitted: 29 Jul 2015 Electronic form version 1.4