Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

Flow morphologies after oblique shock acceelration of a cylindrical density interface[1] PATRICK WAYNE, DYLAN SIMONS, DELL OLMSTEAD, C. RANDALL TRUMAN, PETER VOROBIEFF, University of New Mexico, SANJAY KUMAR, IIT Kanpur — We present an experimental study of instabilities developing after an oblique shock interaction with a heavy gas column. The heavy gas in our experiments is sulfur hexafluoride infused with 11% acetone by mass. A misalignment of the pressure and density gradients results in three-dimensional vorticity deposition on the gaseous interface, dtriggering the onset of Richtmyer-Meshkov instability (RMI). Shortly thereafter, other instabilities develop along the interface, including a shear-driven instability that presents itself on the leading (with respect to the shock) and trailing edges of the column. This leads to the development of rows of co-rotating "cat's eye" vortices, characteristic of Kelvin-Helmholtz instability (KHI). Characteristics of the KHI, such as growth rate and wavelength, depend on several factors including the Mach number of the shock, the shock tube angle of inclination α (equal to the angle between the axis of the column and the plane of the shock), and the Atwood number.

[1]This work is supported by the US National Nuclear Security Agency (NNSA) via grant DE-NA0002913.

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Date submitted: 01 Aug 2015 Electronic form version 1.4