Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Vorticity Dynamics with Finite Sound Speed for High Mach Number Richtmyer-Meshkov[1] A.M. RASMUS, C.A. DI STEFANO, K.A. FLIPPO, F.W. DOSS, E.C. MERRITT, N.S. CHRISTIANSEN, A.P. STRICKLAND, D.W. SCHMIDT, Los Alamos National Laboratory — A shock incident on an interface between two materials will deposit vorticity baroclinically. This vorticity will typically cause any perturbations on the pre-shock interface to grow. Many models of the post-shock perturbation evolution assume an infinite sound speed, whereas in the High-Energy-Density (HED) regime the sounds speeds near the interface are often on the order of the characteristic velocities of the perturbation evolution. In this talk, we will present an experimental scheme designed to quickly create a strong, localized vorticity distribution in a system with a finite sound speed. The motion of a tracer extended away from that localized vorticity then allows one to infer when different parts of the experiment learn about the created vorticity distribution. This should yield information about the sound speeds present near the post-shock interface, and could eventually be used to constrain post-shock thermodynamic states along the interface in HED Richtmyer-Meshkov experiments. This work conducted under the auspices of the U.S. DOE by LANL under contract 89233218CNA000001.

[1]This work conducted under the auspices of the U.S. DOE by LANL under contract 89233218CNA000001.

Alexander Rasmus
Los Alamos National Laboratory

Date submitted: 29 Jun 2020 Electronic form version 1.4