Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

Influence of interference of perturbation waves on the dynamics of Richtmyer-Meshkov flows[1] ARUN PANDIAN, SNEZHANA ABARZHI, Carnegie Mellon University — We study the dynamics of structures that are formed due to Richtmyer-Meshkov instability (RMI) at the interface between two fluids with different densities when a strong shock wave refracts it [1]. While previous research in this area was focused on the effects of the wavelength and amplitude of the interface perturbation, the information was largely ignored on the influences of the relative phase of a multi-wave perturbation and the interference of the perturbation waves on RMI evolution. Applying group theory analysis and Smooth Particle Hydrodynamics simulations, we study the effects of the relative phase of the interfacial sinusoidal waves on the structure of bubbles and spikes that is formed at the interface after the shock passage. A number of new qualitative and quantitative effects are found, and the effect of the wave interference on RMI evolution is observed. In particular, evidences so far indicate that the symmetry of the interface strongly influences the spike morphology as compared to asymmetric cases. We discuss how one may control the growth of RMI by controlling the phases of waves of the initial perturbation

[1]Support of the National Science Foundation is warmly appreciated.

Snezhana Abarzhi
Carnegie Mellon University

Date submitted: 15 Jul 2015 Electronic form version 1.4