Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

Generalized Rayleigh-Taylor and Richtmyer-Meshkov instabilities in particle-seeded flow[1] PETER VOROBIEFF, JOSEPH CONROY, MICHAEL ANDERSON, ROSS WHITE, C. RANDALL TRUMAN, The University of New Mexico, SANJAY KUMAR, University of Texas-Brownsville — We describe a hydrodynamic instability analogous to Rayleigh-Taylor (RT) and Richtmyer-Meshkov (RM) instabilities in gravity-driven or impulsively-accelerated two-phase flows where the seeding density of the second phase (and the resulting average density) is initially non-uniform. The forcing causes the second phase (in our experiments, submicron-sized droplets in gas) to move with respect to the embedding medium. With sufficient seeding concentration, this leads to entrainment of the embedding phase. The resulting movement is similar to the movement that would evolve in a mixing flow with no second phase seeding, but with non-uniform density (e.g., a mixture of lighter and heavier gases), where RT and RM instabilities develop in the case of gravity-induced and impulsive acceleration respectively.

[1]Special thanks to S. "Bala" Balachandar (U. of Florida) for inspiring this work. This research is funded by NNSA through DOE Grant DE-PS52-08NA28920 and by DTRA awards HDTRA1-07-1-0036 and HDTRA1-08-1-0053.

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Date submitted: 10 Aug 2010 Electronic form version 1.4