Abstract Submitted
for the DFD07 Meeting of
The American Physical Society

Effects on Initial Development of Rayleigh-Taylor Instabilities due to a change in Initial Conditions FREEMAN M. PEART, Texas A&M University, ROBERT A. GORE, MALCOLM J. ANDREWS, Los Alamos National Laboratory — Initial condition effects on the initial development of Rayleigh-Taylor (RT) mixing will be presented. A small Atwood number water channel facility at Texas A&M University has been used to provide a statistically steady experiment for the investigation of buoyancy driven turbulent mixing. Parallel streams of hot and cold water are initially separated by a splitter plate, the streams oriented in such a way to place the cold water above the hot water. At the end of the splitter plate, the two streams mix and form a buoyancy-driven RT mixing layer. Isotropic turbulence was introduced into the free streams using passive grids and the growth rate for the resultant RT mixing layer has been measured experimentally using image analysis techniques. Thus, we have been able to study the overall development of the mixing region using different initial conditions (isotropic turbulence). Our findings support the notion that the overall growth of RT mixing is strongly dependent on initial conditions, and our results provide a useful database for initialization of mix models.

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Date submitted: 03 Aug 2007 Electronic form version 1.4