Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Experimental Measurement of the Density Fluctuation PDF for small Atwood, high Schmidt number, Rayleigh-Taylor mixing ANDREW DUGGLEBY, YUVAL DORON, Texas A&M University, MALCOLM ANDREWS, Los Alamos National Lab — The experimental measurement of the probability density function (pdf) of density fluctuations in a Rayleigh-Taylor small Atwood water channel facility with high Schmidt number is reported. In the experiments, molecular mixing is measured by a phenolphthalein chemical indicator that reacts, turning from transparent to pink, when the heavy (salty & acidic) and light (fresh & alkali) water streams mix together. The degree of molecular mixing is determined from the relationship between amount of the chemical reaction formed and the density variance $\bar{\rho'^2}$. By measuring the concentration of the reaction product by backlit optical technique for various initial pH differentials, a detailed pdf of the density fluctuation has been obtained. The shape of the density fluctuation pdf as well as future research will be discussed.

Andrew Duggleby
Texas A&M University

Date submitted: 31 Jul 2008 Electronic form version 1.4