Abstract Submitted
for the DFD16 Meeting of
The American Physical Society

Effect of noise on Rayleigh-Taylor mixing with space-dependent acceleration[1] ARUN PANDIAN, SNEZHANA ABARZHI, Carnegie Mellon University — We analyze, for the first time by our knowledge, the effect of noise on Rayleigh-Taylor (RT) mixing with space-dependent acceleration by applying the stochastic model. In these conditions, the RT mixing is a statistically unsteady process where the means values of the flow quantities vary in space and time, and there are also the space and time dependent fluctuations around these mean values. The stochastic model is derived from the momentum model and is represented by a set of nonlinear differential equations with multiplicative noise. The models equations are solved theoretically and numerically. Investigating a broad range of values of acceleration, self-similar asymptotic solutions are found in the mixing regime. There are two types of mixing sub-regimes (acceleration-driven and dissipation-driven respectively), each of which has its own types of solutions and characteristic values with the latter saturating to a value on the order of one. It is also observed that the representation of the dynamics in an implicit form is noisier as compared to the case of an explicit time-dependent form.

[1]The work is supported by the US National Science Foundation

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Date submitted: 16 Jul 2016 Electronic form version 1.4