

Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Stochastic modeling of statistically unsteady turbulent mixing¹

A.T. QAMAR, M. CADJAN, S.I. ABARZHI, The University of Chicago — Rayleigh-Taylor and Richtmyer-Meshkov turbulent mixing are statistically unsteady processes. Their dynamics combines coherence and randomness, and their mean values and fluctuations are both time-dependent. These turbulent processes have a number of symmetries and are characterized by a set of invariant measures [EPL 91, 12867]. Employing these invariant measures, we developed a stochastic model for Rayleigh-Taylor and Richtmyer-Meshkov turbulent mixing in the case of sustained, time-dependent and impulsive acceleration. For the flow quantities, the effect of fluctuations on the mean values is studied and their statistical properties are analyzed. Requirements for statistical quality of experimental and numerical data are outlined. Mechanisms of mitigation and control of turbulent mixing processes are proposed. Their implementation in experiments and simulations is discussed.

¹The work is supported by the US National Science Foundation and by the US Department of Energy.

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Date submitted: 16 Jul 2011

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