

Abstract Submitted  
for the DFD19 Meeting of  
The American Physical Society

**Rayleigh-Taylor instability with sinusoidal acceleration histories<sup>1</sup>**

ZACHARY FARLEY, DENIS ASLANGIL, ARINDAM BANERJEE, Lehigh University, ANDREW G.W. LAWRIE, University of Bristol — We will discuss the effects of accel-decel-accel (ADA) acceleration histories on the Rayleigh-Taylor instability (RTI) using a sinusoidal acceleration profile. An implicit large eddy simulation technique based massively parallel code was used for the purpose. Majority of the reported studies in scientific literature use an acceleration profile that consists of a series of step-functions. However, it is conjectured that the sinusoidal profile would better represent the transitions between accel and decel phases in real applications. We will present our findings of comparisons between the two sets of acceleration histories. In RTI with variable acceleration studies, a length scale,  $Z(t)$  has been commonly used and is defined as the double integration over time of the time variable acceleration,  $g(t)$ . The flow evolution of the two profiles due to variations in  $Z(t)$  will be discussed. In addition, global parameters to measure the growth of the instability and turbulence statistics that characterize the internal mechanics of the dynamically accelerated and decelerated phases of the RTI mixing layer will be discussed.

<sup>1</sup>Authors acknowledge support from DOE/NNSA Grant DE- NA0003195 and the NSF-CAREER Award 1453056.

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Date submitted: 01 Aug 2019

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