

Abstract Submitted
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Experiments on the Rayleigh-Taylor and Richtmyer-Meshkov instabilities utilizing a large Atwood number miscible liquid combination.

MICHAEL ROBERTS, JEFFREY JACOBS, University of Arizona — Experiments are presented in which an incompressible system of two miscible liquids having a relatively large density difference is accelerated to produce the Richtmyer-Meshkov (RM) or Rayleigh-Taylor (RT) Instabilities. The fluid combination (having an Atwood number of approximately 0.5) is contained within a rectangular tank and initially orientated in the stably stratified configuration. The tank is oscillated in the horizontal direction producing a standing wave two-dimensional initial perturbation on the interface. In the RM experiments the system is released from the top of the rail system, and bounces off a spring to produce the impulsive acceleration. In the RT experiments, the same rail system is used. However, in this case the system is accelerated downward at constant rate using a weight and pulley system. The resulting fluid flows are visualized using a backlit photography. Amplitude measurements taken from the images are compared with existing models and solutions.

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