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Miscible-Liquid experiments on the Rayleigh-Taylor and Richtmyer-Meshkov instabilities GUILLAUME LAYES, MICHAEL ROBERTS, JEFFREY JACOBS, University of Arizona — Experiments are presented in which an incompressible system of two miscible liquids is accelerated to produce the Richtmyer-Meshkov (RM) or Rayleigh-Taylor (RT) instabilities. The initially stably stratified liquid combination is contained within a rectangular tank that is accelerated on a vertical rail system. In the RM Experiments the tank is released from the top of the rail system, after which it impacts a spring that introduces the impulsive acceleration and the RM instability develops while the tank is in freefall. In the RT experiments, the same rail system is used; however, instead of impacting a spring the tank is accelerated downward using a weight and pulley system. The resulting fluid flows are observed using a high speed video camera traveling with the fluid system. The initial perturbations are either forced (by oscillating the tank in the horizontal or the vertical direction to produce gravity waves) or random (as a result of molecular motion or background noise).

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