

Abstract Submitted  
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**Miscible and immiscible, forced and unforced experiments on the Rayleigh-Taylor instability** MICHAEL ROBERTS, MATTHEW MOKLER, JEFFREY JACOBS, University of Arizona — Experiments are presented in which an incompressible system of two liquids is accelerated to produce the Rayleigh-Taylor instability. In these experiments, the initially stable, stratified liquid combination is accelerated downward on a vertical rail system in one of two experimental apparatuses: an apparatus in which a system of weights and pulleys accelerates the liquid filled tank, or a new apparatus which uses linear induction motors to accelerate the tank to produce much greater acceleration levels. Both miscible and immiscible liquid combinations are used. In both apparatuses the resulting fluid flows are visualized with backlit imaging using LED backlights in conjunction with monochrome high-speed video cameras, both of which travel with the moving fluid filled containers. Initial perturbations are either unforced and allowed to progress from background noise or forced by vertically oscillating the liquid combination to produce parametric internal waves. The mixing layer growth rate  $\alpha$  is determined for all cases and compared to numerical simulations and past experiments.

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