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Buoyancy Driven Mixing Induced by Volumetric Energy Deposition ADAM J. WACHTOR, VERONIKA MOCKO, FARZANEH F. JEBRAIL, MALCOLM J. ANDREWS, ROBERT A. GORE, Los Alamos National Laboratory — A two fluid, buoyancy driven mixing experiment, which transitions from a Rayleigh-Taylor stable configuration to a Rayleigh-Taylor unstable configuration via preferential heating obtained with microwaves, is presented. The experiment is initiated with a light, non-polar fluid at rest atop a heavier, more polar fluid. Microwave energy causes rotation of the polar molecules in the heavier fluid, and the density of the bottom fluid begins to drop due to thermal expansion. As heating of the bottom fluid continues, the system passes through the neutral stability point and buoyancy driven mixing ensues. Challenges for designing an experimental facility, and data collection limitations, for this investigation are discussed. Experimental and numerical predictions of the neutral stability point, and onset of buoyancy driven mixing, are compared, and differences with classical Rayleigh-Taylor driven turbulence are discussed.

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