

Abstract Submitted
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Progress on the Two-Wheel High Acceleration Experiment to Study Rayleigh-Taylor Turbulence¹ AARON HALEY, ARINDAM BANERJEE, Missouri S&T — A new two-wheel experiment, scaled by a factor of 4 from the previously presented proof of concept, is used to study turbulent incompressible Rayleigh-Taylor (RT) instability. Two counter rotating wheels are mounted side by side such that axes of rotation are normal to gravity. A test section containing pairs of either miscible or immiscible fluids is attached to the first wheel and rotated so that a stable stratification is formed. The test section is then transferred to the adjacent wheel using a pneumatically actuated transfer mechanism. RT instability is effected by the inverted density stratification relative to the centrifugal acceleration. Late time RT turbulence at buoyancy $Re \approx 230,000$ is achieved. Details of the mixing layer development and growth constants are captured using high speed backlit imaging. A variety of fluid combinations (immiscible and miscible) are utilized to investigate development of RT mixing over a range of Atwood numbers and results are compared with data available in the literature.

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