Abstract Submitted
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Effect of shear on mixing in R-T mixing layers at low Atwood numbers BHANESH AKULA, Department of Mechanical Engg., Texas A&M University, MALCOLM ANDREWS, Las Alamos National Laboratory, DEVESH RANJAN, Department of Mechanical Engg.,Texas A&M University — Effect of shear on R-T mixing is studied at two different Atwood numbers using the gas channel facility at Texas A&M University. The channel basically consists of two streams separated by a splitter plate. Pure air flows on top of the plate where as the lower density air Helium mixture flows on bottom and R-T mixing starts right after the splitter plate. Two different techniques, high resolution digital image analysis and simultaneous 3 wire cold wire Anemometry are used to measure R-T mixing growth rates. Results obtained from both the techniques are compared. Temperature is used as a marker to identify the streams and density is calculated from the temperature measured using a cold wire. Experiments are performed at Atwood numbers 0.04 and 0.1. At these Atwood numbers, effect of shear is studied by varying the velocity of one of the streams (mainly top stream). Simultaneous 3 wire cold wire Anemometry is performed at the vertical center line at three different axial locations. Different parameters obtained from these measurements including, θ (molecular mixing parameter), $\overline{\rho'^2}$ and vertical turbulent mass flux $\overline{\rho' v'}$ and their effect on mixing growth rate are discussed.

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