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The mixing layer downstream of a “ Λ ”-notched splitter plate
LUTZ TAUBERT, EMILE SUEHIRO, ISRAEL WYGNANSKI, The University of Arizona — The turbulent mixing layer created downstream of a “ Λ ”-notched splitter plate that was aligned with the free stream and whose trailing edge was inclined at 60° to the flow was investigated experimentally at two velocity ratios. It was observed that the rate of spread of this mixing layer relative to its local center was identical to the rate of spread of a two dimensional mixing layer provided all distances were measured from the trailing edge. Harmonic excitation was applied to this base flow by means of flaperons mounted on the trailing edges of the splitter plate. The external excitation enabled the separation of the instability wave fronts originating from the two opposing trailing edges of the “ Λ ”-notch. The effects of excitation frequency, amplitude and phase between the oscillating flaperons on the spreading rate and the orientation and velocity of the large coherent structures in the mixing layer were determined and the variation of the wave front angles was analyzed along their paths.

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