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Flow Field Features of the Induced Recirculation Zone using Planar Jet Injection.[1] KAREEM AHMED, DAVID FORLITI, JACK MOODY, State University of New York at Buffalo — The objective of the present work is to study the recirculation bubble induced by injecting a planar jet in to a channel flow. The work is motivated by the desire to provide a flame stabilization environment for ramjet engines without the use of a sudden expansion or bluff-body which incurs drag penalties. A planar jet issuing into a cross flow is used to create a recirculation zone reminiscent of the flow field created downstream of a rearward-facing step configuration which is used in a current ramjet/scramjet systems. The effect of confinement at high momentum flux ratios leads to a saturation of the control of the recirculation bubble size and strength. Comparison to a rearward-facing step flow shows the current method produces higher turbulence levels and larger integral length scales. It is clear that the flow field produced with fluidic injection has potential for flame anchoring and enhancing combustion rates.

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