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Investigation of the Non-Isothermal Convective Mixing of Turbulent, Round, Wall Jets PAUL KRISTO, MARK KIMBER, Texas AM Univ — The wall jet has become a paradigm for geometrically bounded flows due to the intrinsically difficult nature of the advection promoted by the geometry of the jet, coupled with prompt diffusion from the adjacent wall. Previous experimental investigations have sought to characterize the hydraulic and thermal behavior of such flows, however the physics promoted by parallel coplanar round jets has received inadequate experimental attention. The current effort is comprised of three parallel, coplanar, equidistant round jets issuing vertically downward into a pseudo-unconfined test section. The outer diameters of the jets are placed tangentially along a smooth flat plate. Non-intrusive optical techniques are incorporated for both hydraulic and thermal observations. Preliminary tests provide accurate inlet boundary conditions for each case. Reference metrics are captured during testing to account for ambient effects and readings inside of the test section. By varying the velocity and temperature inlet parameters, insights are drawn regarding the effects on the merging point (MP) and combined point (CP) of both the flow and thermal fields. Velocity fields in the plane normal to the wall yield additional insight into the deceleration caused by dissipation from both the plate and surrounding stagnant fluid.

Mark Kimber
Texas A
M Univ

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