Abstract Submitted
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Structure, Mixing, and Stability of Flush and Elevated Jets in Crossflow[1] LEVON GEVORKYAN, DANIEL GETSINGER, TERRY WEN YU PENG, OWEN SMITH, ANN KARAGOZIAN, University of California, Los Angeles — The present experiments explore the characteristics of equidensity and variable density transverse jets using acetone PLIF, stereo PIV, and hot wire anemometry. Jets composed of mixtures of helium and nitrogen are injected normally from different types of nozzles (flush and elevated with respect to the wind tunnel wall, and converging as well as straight shapes) into an air crossflow. A range of jet-to-crossflow momentum flux ratios J and density ratios S is examined, within which previous studies[2] have identified conditions for upstream shear layer transition from convective to absolute instability. The present study examines the relationships among transverse jet structure, including vortical rollup and cross-sectional symmetry/asymmetry, jet mixing characteristics, and shear layer stability characteristics. The role of the crossflow boundary layer as well as jet injection systems for structure, mixing, and stability is evaluated and related to prior observations on vorticity evolution for jets in crossflow.

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[2]Megerian, et al., **JFM**, 2007; Davitian, et al., **JFM**, 2010; Getsinger, et al., **Expts in Fluids**, 2012

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