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Critical Point Identification and Classification Methods for Jets in Turbulent Crossflow[1] GRAHAM FREEDLAND, Portland State University, STEPHEN SOLOVITZ, Washington State University Vancouver, RAÚL BAYOÁN CAL, Portland State University — The complex interconnected vortex systems present in jets in cross-flow are important in understanding both the far-field development and entrainment. As identified in previous works, the presence of high turbulence intensity inflow increases the shear layer expansion and reduces the lee-side wake region where vortex systems are dominant. Stereoscopic particle image velocimetry data is collected in the $x-y$ plane of a jet (center-plane) for low $(3-5\%)$ and high $(15-20\%)$ turbulence intensity inflow. Critical point analysis is performed on each instantaneous flow-field and classified through the characteristic equation of the deformation tensor. Shear layer vortices are identified through the q-criterion and compared across cases. Statistics of changes in size and spread characterize the influence of inflow velocity and turbulence intensity. Critical points within the lee-side wake region are identified to identify changes to the unstable focus and wake region. Further characterization of all critical points through eigenvalues of the deformation tensor is used to identify changes in the interaction with turbulent inflow.

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