

# Update on the Juncture Flow PIV Results and Future Plans (Oral Presentation)

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A novel, embedded, 2D Particle Image Velocimetry system has been developed and implemented to obtain off-body velocity measurements in the junction of an 8% wing-body configuration in the NASA Langley Research Center 14- by 22-Foot Subsonic Tunnel. Although the initial purpose for implementing the system during this test was to evaluate system performance and identify potential risks, a considerable amount of data were obtained in the wing-fuselage junction near the trailing edge at a Reynolds Number of 2.4 Million and angle of attack of 5 degrees. In addition to providing notable efficiencies with regard to image acquisition and test operations, the PIV system captured unique details of the flow separation to complement the extensive suite of measurement techniques applied during the test. Instantaneous PIV vector fields reveal that the flow separation is not stationary but rather highly dynamic. Mean flow statistics calculated from the PIV measurements highlight where reverse flow and Reynolds stresses are concentrated in the separated region and agree well with results from the embedded Laser Doppler Velocimeter system and Computational Fluid Dynamics. The comparisons and additional insight gained during this effort will help guide system improvements for the upcoming entry in 2020.