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**Pod Study of the Coherent Structures within a Turbulent Spot**

AMY LANG, PABLO HIDALGO, University of Alabama, WILLIAM THACKER, St. Louis University — In this experimental study, turbulent spots were created in the boundary layer on a flat plate inside a water tunnel using a peristaltic pump. Digital Particle Image Velocimetry (DPIV) obtained velocity vector field plots of turbulent spots and the Proper Orthogonal Decomposition (POD) analysis was used in order to identify and study the coherent structures within turbulent spots. The part of the turbulent spot studied was a 5 x 5 cm region of the trailing edge, since it was impossible to capture the entire spot due to size constraints. This region of the trailing edge was also chosen because it corresponded to the best data obtained from the DPIV system. The POD analysis resulted in eigenvalues, which represent the energy contributed by each coherent structure. The velocity vector fields corresponding to the POD eigenvectors were obtained and plotted in order to visualize each coherent structure. The results revealed the presence of low and high-speed streaks, as well as hairpin vortices within the turbulent spot.

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