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The Development of a Feature Comparison Based Technique to Analyze PTV Results[1] JOEY DUNCAN, DANA DABIRI, University of Washington, MORTEZA GHARIB, Caltech, JAY HOVE, University of Cincinnati — A new post processing technique based on feature comparison is developed for analysis of Particle Tracking Velocimetry (PTV) results. Similar to methods employed in Finite Element Modeling, fluid properties such as shear strain rate and rotation are calculated for the centers of triangular features whose vertices are particle locations. These features are created using Delaunay Tessellation. In addition, no interpolation step is required, meaning that derivative data can be obtained directly from nonuniform velocity data, increasing computational efficiency. Analysis of the validity of this novel technique is given, showing that a least squares fit is required to find two directional derivatives from three data points (vertices) in each feature. Comparisons to traditional differentiation methods for various examples of fluid flow are given.

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