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PIV —Galilean Identification of Large Scale Coherent Motions in a Shear Layer JOHN FOSS, KYLE BADE, Michigan State University — 1,000 PIV realizations were processed in a Galilean reference frame image of the shear layer's velocity field. Images with at least one node were processed as a collapsed sphere with four holes (Foss (2004) and (2007)). A square domain of side L, surrounding the node-center, was evaluated for its circulation: Gamma(L). The size of the "large Scale Coherent Motion (LSCM)" was defined as the maximum value of <omega> where <omega> = Gamma(L)/L**2. Lm designates the domain size for the maximum $< \omega >$ value. Statistical properties of the LSCMs include their sizes [Lm/theta(x)], strengths [<omega m>Lm/Uo], their position and their probability of occurrence within the observation window. These LSCMs are "rare events" as shown by their <omega m>/(uniformly distributed vorticity) = $\sim$ 100. The LSCMs may be related to the anomalous omega z (t) traces seen in direct vorticity measurements. J.F. Foss (2004) "Surface Selections and Topological Constraint Evaluations for Flow Field Analyses," *Experiments in Fluids*, Springer-Verlag, **37**, pp. 883-898. J. Foss, *Springer Handbook of Experimental Fluid Mechanics*, Chapter C.13, Springer-Verlag, Berlin, 2007.

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