Abstract Submitted
for the DFD09 Meeting of
The American Physical Society

The Low Speed Intermittent Region of a Single Stream Shear Layer (SSSL)[1] JOHN FOSS, Michigan State Unversity, JASON PEABODY, Michigan State University — External intermittency: intermittent presence of vortical fluid, exists on the high and the low speed sides of a SSSL. From Corrsin and Kistler (1954) it is understood that the vortical fluid is bounded by a viscous superlayer (VSL) that is well-defined given zero vorticity in the entrained fluid. That condition is met for the SSSL flow of Morris and Foss (2003). The smoke trace from an incense stick provides a convenient technique to mark the 3-D locations of the VSL. Specifically, the vorticity at the VSL "shreds" the end of the trace; the shredding is captured by two cameras with calibrated x-y=f(z) and y-z=g(x) image planes. Complementary transverse vorticity measurements were acquired in the spatial domain indicated by the "shredding." Interpreted results will be presented. Corrsin, S. and Kistler, A.L. (1954) "The Free Stream Boundaries of Turbulent Flows," NACA TN 3133. Morris, S.C. and Foss, J.F. (2003) "Turbulent boundary layer to single-stream shear layer: the transition region", Jour. Fluid Mechanics, 494, pp. 187-221.

[1]Support from NSF, CTS0352710

John Foss
Michigan State Unversity

Date submitted: 29 Jul 2009 Electronic form version 1.4