

Abstract Submitted  
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**Vorticity Based (External) Intermittency measurements in a High  $R_\theta$  Single-Stream Shear Layer**<sup>1</sup> JOHN F. FOSS, AREN HELSUM, Michigan State University — The MSU four-sensor (transverse) vorticity probe has been used to determine the intermittency function ( $I(t)=0,1$ ) in a single-stream shear layer. The measurements were taken in the self-preserving region ( $x/\theta(0)=484$ ) with  $R[\theta(x)=9\times 10^4]$ . The  $I(t)$  signal permits conditionally sampled measures of the intermittent turbulence field. The mean intermittency  $\langle I \rangle$  distribution is compared with that previously reported (1) and (2). It is also compared with the  $\langle I \rangle$  distribution created from the use of an advanced surrogate method (3). Distinctive conditionally sampled results include: i) a constant  $[\text{mean}(u'v')]/[\sigma(u)\sigma(v)]$  distribution for the  $I=1$  condition, ii) clear evidence of fluid from both high- and low-speed irrotational streams to the peak  $\langle I \rangle$  location ( $\bar{u}/U_o=0.5$ ), and iii) robust dissipation even as  $\langle I \rangle \rightarrow 0$  for large values of  $[(y-y/2)/\theta(x)]$ . 1. Wygnanski, I. and Fiedler, H. E., (1970). “The two-dimensional mixing region”. *JFM*, Vol. 41, pp. 327-361. 2. R.C. Haw, J.K. Foss and J.F. Foss, “Vorticity Based Intermittency Measurements in a Single Stream Shear Layer” *proc. Second European Turb. Conf. Advance in Turbulence 2*, Ed. H.H. Fernholz and H.E. Fiedler Spring Verlag, Berlin (1989). 3. Hedley, T.B., and Keffer, J.F., (1974). “Turbulent/non-turbulent decisions in an intermittent flow”. *JFM*, Vol. 64, pp. 625-644

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John Foss  
Michigan State University

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