measurements has the instantaneously antisymmetric characteristic expected of a vortex street structure.

5) At least on the basis of current measurement techniques and their interpretation, no significant two-dimensionality is discernible.

In summary, conclusions 1 through 4 support the existence of the vortex street structure while conclusion 5 does not. However, the previous comments with respect to the authors' reservations concerning the two-dimensionality measurements should be noted.

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DISCUSSION

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This is a well-aimed experiment which seems to settle the point at issue very convincingly. The lack of two-dimensionality of the coherent structure, as evidenced by correlation measurements, corresponds to that in the mixing layer or "half jet"[1] : in the mixing layer the $R_u(0,0,\delta_z)$ correlation goes through zero at $\delta_z/x \simeq 0.07$, virtually the same value as in the present Fig. 8. Reference [A1] also addresses the effect of constraining walls and shows that it can be considerable but leads to an *increase* of two-dimensionality of the fluctuation field, and is largely confined to the irrotational fluctuations which are the *result* of the true, vortical turbulence. Smoke flow visualization gives total particle displacement, the integral of particle velocity over the lifetime, and in this case there may be some memory of the two-dimensional transition region.

This discusser's world-view is that a turbulent free shear layer with a point of inflexion in the velocity profile is not too far from instability to the two dimensional vortex-roll disturbances that grow in a laminar free shear layer - crudely, the Reynolds number based on *eddy* viscosity is of the order of the critical Reynolds number of the corresponding laminar flow. However, vortex rolls perturbed by background turbulence are likely to become strongly three-dimensional by self-induction, and take up a form more like the classical horseshoe vortex, which is the higher mode of instability of a spanwise vortex line in a mean shear with or without a point of inflexion. The streamwise vortices in the "braids" between vortex rolls can be regarded as embryonic horseshoe legs. Corcos and Lin [A2] suggest that "the fundamental mechanism of growth is two-dimensional and little affected by the presence of rigorous three dimesional motion." In other words, the difference between the cross-leg of a horseshoe and a slice of a vortex roll may be more semantic than real. The circumstances in which the slice is narrow in the spanwise direction are not yet clear but do seem to include the two-dimensional jet studied in the present experiment.

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Authors' Closure

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