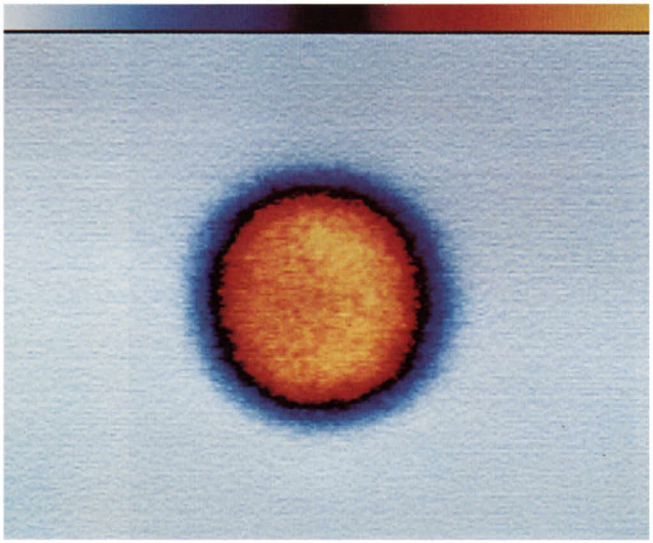

Figure 1(a)

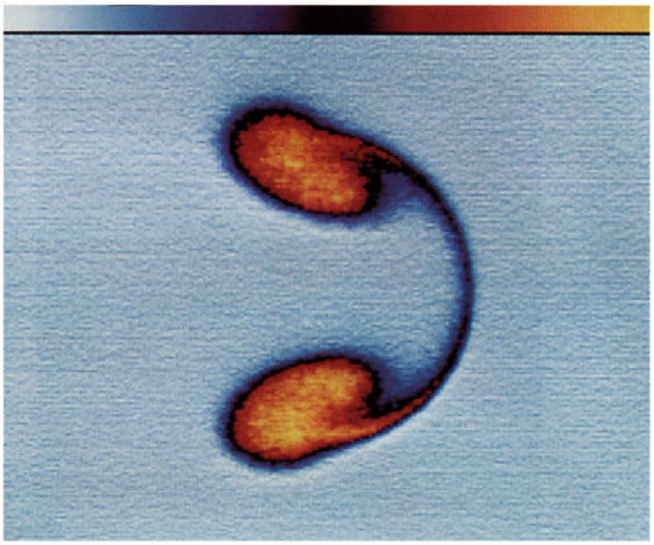

Figure 1(b)

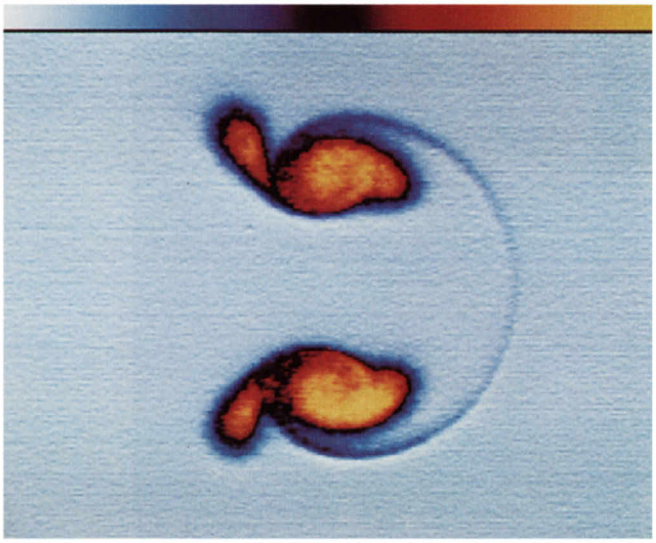

Figure 1(c)

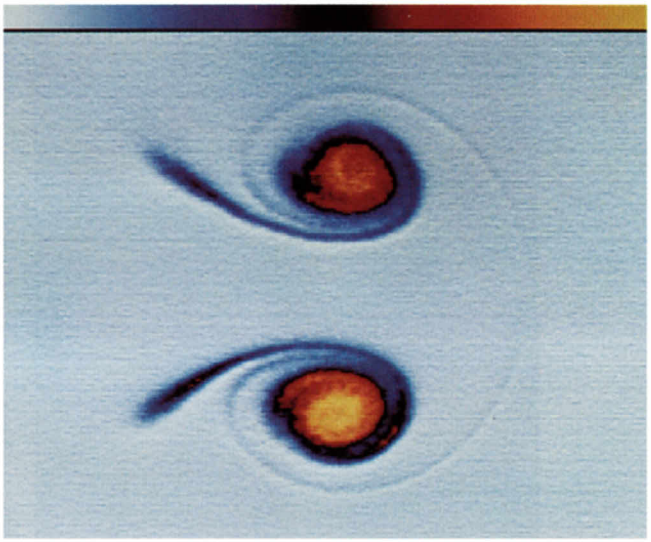

Figure 1(d)

PLIF FLOW VISUALIZATION OF A SHOCK ACCELERATED TRANSVERSE HELIUM JET

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A sequence of fluorescent images is shown, depicting the time evolution of the cross section of a laminar helium jet as it distorts as a result of the passage of a weak shock wave. The 0.79 cm diam fully developed laminar jet was injected vertically into the initially air-filled GALCIT 17 in. shock tube at a velocity of 130 cm/sec. Baroclinically generated vorticity, produced by a Mach 1.1 shock wave interacting with the density gradient at the jet boundary, causes the originally circular jet to initially distort then roll up, eventually forming a vortex pair. The laser-induced fluorescence was accomplished using biacetyl, a gaseous fluorescent dye, which was mixed with the helium stream. A flashlamp-pumped dye laser produced a laser sheet, illuminating a cross section of the jet 2.5 cm from the jet exit. The resulting fluorescent image was captured using an intensified solid-state video camera and a frame grabber. The image data is shown displayed in false color where the intensity is proportional to biacetyl concentration. The first photograph in the sequence, Fig. 1(a), is a cross section of the undisturbed jet, providing a view of the initial conditions. Next are images from three separate runs, Figs. 1(b)–1(d), taken at 0.35, 0.5, and 0.8 msec, respectively, after the passage of the shock wave, which illustrate the transformation of the initially circular jet into a pair of line vortices.

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