

Figure 1. Circular cylinder, $Re. = 100$ 

Figure 2. Wide Wake



Figure 3. Narrow Wake



Figure 4. Plan View

Suppression of Kármán Vortex Shedding

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The photographs show flow visualization results from towing tank experiments to study flow past a sinuous bluff body. The body has a circular cross section with constant diameter D along the span and an axis that is sinuous. All the visualizations are for a Reynolds number, based on D , of 100. For the model shown, the wavelength is equal to $7.5D$ and the peak-to-peak wave height is equal to $0.166D$. These experiments were carried out in the Hydraulics Laboratory of the Department of Aeronautics at Imperial College and the flow was visualized using laser-induced fluorescence.

Key features of the results are that von Kármán type vortex shedding (Fig. 1) is suppressed and there is observed

to be a periodic variation in the wake width across the span. A wide wake (Fig. 2) is found where the body protrudes farthest downstream at a trough and a narrow wake (Fig. 3) is found behind a peak. The plan view (Fig. 4) shows the flow to be quite different to that behind a cylindrical bluff body, with vortex loops trailing behind the troughs. The results shown here are in agreement with earlier work on rectangular sections with a wavy front face¹ where shedding was suppressed and substantial drag reductions were recorded.

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¹P. W. Bearman and J. C. Owen, "Reduction of bluff body drag and suppression of vortex shedding by the introduction of wavy separation lines," *J. Fluids Struct.* **12**, 123 (1998).