

Two Dimensional VIV of a Circular Cylinder Pinned at One End*

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This study is primarily on the vortex induced vibration (VIV) of a flexibly mounted rigid circular cylinder in the free stream. This fluid structure interaction experiment was carried out in the Rutgers Free-Surface Water Tunnel facility. A thin wall, 1-in diameter, 43-in long circular cylinder with a low mass ratio is used for this purpose. This cylinder is elastically mounted to the test section by a small diameter stainless steel pin. It is a freely oscillating cylinder and its displacement is not limited only to the cross-flow or transverse direction. Extensive LIF flow visualizations have been carried out on the mid-section of the cylinder to investigate the response of the cylinder as well as the vortex shedding pattern. This study is carried out on Reynolds number based on diameter ranging from 820 to 6050. Very interesting vibration modes and vortex shedding modes have been observed from this study. Symmetric vortex shedding has been observed at low Reynolds number and the vortex shedding mode is argued to take a periodic form.

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