

Abstract Submitted
for the DFD06 Meeting of
The American Physical Society

Harmonically driven oscillating flexible flat plates behind a bluff body JEREMY PENA, DAVID LATORTUE, JAMES ALLEN, PAULO DE SOUSA, New Mexico State University — This experimental study details the oscillations of the flexible plate, mounted behind a bluff body. Plates of different stiffness were individually tested. Each plate was oscillated a range of frequencies 0.1 Hz to 2.0 Hz to produce a range of Strouhal numbers based on the bluff body width of 0.01-0.6. The natural frequency produced from the bluff body excites the oscillating plates. Similar to a fish behind a rock, the most energy efficient oscillating frequency is when the Strouhal number from the oscillating plates matches the shedding frequency of the bluff body. Efficiency is determined by the work input to the system via torque transducers. Experiments were used to determine an optimal stiffness material that couples most efficiently with the shedding of the structures from the bluff body. Torque sensors and Particle Image Velocimetry (PIV) were used to measure coupling effects.

James Allen
New Mexico State University

Date submitted: 04 Aug 2006

Electronic form version 1.4