What Is Vortex Shedding? "The Answer, My Friend, Is Blowing in the Wind"

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Which test piece design is least effected by the instability caused by vortex shedding and how can changing the design make the test pieces more stabile? The purpose is to determine how vortex shedding created by the wind effects each test piece design and how to increase the stability of each test piece by making adjustments to the test piece. I hypothesized that the Control D-Shape RSF (Round Side toward Fan) would prove to be the most stable shape in my testing, and the Straight Bar modification would decrease the oscillations more than the other modifications, thereby offering the most stabilization. I determined which test piece was the most stabile by calculating the frequency, the height of the oscillations, and the lateral movement of each piece. First, I built a 53.34 cm x 86.36 cm frame and used two sets of extension springs to suspend the test pieces. I built the following test pieces: Dowel, Square, D-Shape RSF, and D-Shape Flat. For the experiment procedure, each test piece was suspended within the wood frame using extension springs and the centerpieces tested by blowing a 1 HP ducted fan across the middle of the test piece. Harmonic resonance was generated in several of the experiments. The least stabile shape design was the D-Shape Flat (Flat Side toward Fan), and the least stabile modification was the Green Wire on D-Shape Flat. Proving my design hypothesis correct, the most stabile design was the Control D-Shape. However, the most stabile modification was the Green Wire on D Shape-RSF proving my modification hypothesis incorrect.

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