

Abstract Submitted
for the TSF11 Meeting of
The American Physical Society

Aerodynamic Self Excitation of a Taut Elastic Ribbon SAM MATTESON, DAVID LAMBERT, University of North Texas — The investigators analyzed, both theoretically and experimentally, the motion of a taut ribbon of elastic material in an air stream to show that the resulting standing-wave motion is a manifestation of self excitation. Self excitation is a phenomenon in which the oscillatory motion of the object extracts energy from a steady energy source. Such a ribbon simulates the motion of the human vocal folds as well as that of unstable bridge “galloping,” such as is famously exemplified in the Tacoma Narrows bridge collapse. The phenomenon discussed in this talk is also relevant to aerodynamic flutter and the “quaking” of leaves of trees in the breeze. Chief among the findings of this work is the origin of inharmonic modes of oscillation of a self excited ribbon.

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Date submitted: 12 Sep 2011

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