1125-35-580 **Irena Lasiecka** and **Justin T Webster*** (websterj@cofc.edu), 66 George St., Charleston, SC 29424. *Exponential Attractors for Fluttering Plate Models.*

Recent studies of flutter (an instability occurring when a flexible structure is immersed in an inviscid fluid flow) have led to interesting problems in the study of long-time behavior of coupled systems. The panel flutter model involves a nonlinear (von Karman or Berger) plate embedded in the plane, coupled to a perturbed wave equation on the upper half-space. In certain regimes (e.g., for large flow velocities) this model can be reduced to a plate equation with a delay potential, or simply a non-dissipative plate equation. The latter is referred to as a piston-theoretic plate.

In this talk we discuss the reduction of the flow-plate (fluttering panel) model to a piston-theoretic plate equation. We present recent results on the existence of smooth and finite dimensional global attractors for this flutter model in the absence of imposed damping. We utilize the recent quasistability theory, and discuss how it yields a fractal exponential attractor for the dynamics. For Berger's plate model, we show that "large" interior damping actually results in smooth exponential attracting via a novel decomposition of the nonlinear dynamics and the transitivity property of exponential attraction. (Received September 06, 2016)