

Abstract Submitted  
for the DFD20 Meeting of  
The American Physical Society

**Aeroelastic Flutter of an Airfoil in the Presence of an Active Flap**

TSO-KANG WANG, KOUROSH SHOELE, Florida State University — Aeroelastic motion is a ubiquitous instability observed in various applications including aircraft design, renewable energy extraction, animal locomotion, and more. However, the control of the aeroelastic response has been mostly limited to using linear potential flow models. In this work we introduce a novel computational algorithm that enables the use of high fidelity simulations of a fluid-structure interaction (FSI) system with a deforming body to investigate the fluttering phenomena and form a reduced-order model of the system. A spatio-temporal modal analysis technique will be used to understand the effect of prescribed control surface motion on the fluttering response of the airfoil. It will be shown how the results from this study about the role of the structural deformation on the flow can be employed to form a better control method for the aeroelastic problems.

Tso-Kang Wang  
Florida State University

Date submitted: 09 Aug 2020

Electronic form version 1.4