

Abstract Submitted  
for the DFD14 Meeting of  
The American Physical Society

**Dynamic Chord-wise Tip Curvature on Flexible Flapping Plates<sup>1</sup>**

NATHAN MARTIN, MORTEZA GHARIB, Caltech — The aerodynamic characteristics of long rectangular flapping plates are strongly influenced by the interaction between tip and edge vortices. This has led to the development of many tip actuation mechanisms to independently bend or rotate the tip towards the root of the plate in the span-wise direction. In our current work, the influence of dynamically altering the chord-wise curvature of the tip on the generation of aerodynamic forces is investigated; for this case, the two free corners of the flat plate bend towards each other. The parameters of actuation timing, maximum curvature, Reynolds number, flexibility, and tip speed are independently varied to determine their influence. These results will further the fundamental understanding of unsteady aerodynamics.

<sup>1</sup>This material is based upon work supported by the National Science Foundation Graduate Research Fellowship and the Gordon and Betty Moore foundation.

Nathan Martin  
Caltech

Date submitted: 31 Jul 2014

Electronic form version 1.4