

Abstract Submitted  
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**Active Deformation in Insect Wings and Its Effect on Aerodynamic Performance of Flapping Flight**<sup>1</sup> LINGXIAO ZHENG, RAJAT MITTAL, TYSON HEDRICK — While passive deformation in insect wings during flight is well known, we demonstrate the presence of significant active deformation in the wings of butterfly. High-speed videography is used to capture wing kinematics of a Painted Lady butterfly flying freely inside an enclosure. An analysis of the videos shows that the chordwise deformation in the wings of this insect is inconsistent with passive (flow or inertial induced) deformation. It therefore follows that the deformation is produced actively by the insect. Computational fluid dynamics analysis is used to examine the effect of this active deformation on aerodynamic performance and results from this study will be presented.

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