

Abstract Submitted
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Force Production from Near- and Far-Field Vortices on Flapping Wings HUI WAN, ZONGXIAN LIANG, HAIBO DONG, Wright State University, FLOW SIMULATION AND RESEARCH GROUP TEAM — Aerodynamic performance is closely correlated with the vortex formation and vortex structure of a flapping plate. The aerodynamic forces experienced the plate can be obtained from the surface integration of the pressure and shear stress distribution, or alternatively from the time rate of change of the vortex moment in the flow field Direct Numerical Simulation (DNS) is first conducted to generate the flow field information including both velocity and vorticity. Then the aerodynamic forces obtained from the above two methods are calculated and compared. The roles of near-field and far-field vortex structures on force generation are studied. Both two-dimensional plate and low aspect-ratio plate will be discussed. This work is supported by NSF CBET-1055949.

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