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Flow Modulation and Force Control in Insect Fast Maneuver CHENGYU LI, HAIBO DONG, WEN ZHANG, KUO GAI, Wright State University — In this work, an integrated study combining high-speed photogrammetry and direct numerical simulation (DNS) is used to study free flying insects in fast maneuver. Quantitative measurement has shown the significant differences between quad-winged flyers such as dragonfly and damselfly and two-winged flyers such as cicada. Comparisons of unsteady 3D vortex formation and associated aerodynamic force production reveal the different mechanisms used by insects in fast turn. This work is supported by NSF CBET-1055949.

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