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Observation of the wing deformation and the CFD study of cicada[1] HU DAI, SHAHRIZAN MOHD ADAM DAS, HAOXIANG LUO, Vanderbilt University — We studied the wing properties and kinematics of cicada when the 13-year species emerged in amazingly large numbers in middle Tennessee during May 2011. Using a high-speed camera, we recorded the wing motion of the insect and then reconstructed the three-dimensional wing kinematics using a video digitization software. Like many other insects, the deformation of the cicada wing is asymmetric between the downstroke and upstroke half cycles, and this particular deformation pattern would benefit production of the lift and propulsive forces. Both two-dimensional and three-dimensional CFD studies are carried out based on the reconstructed wing motion. The implication of the study on the role of the aerodynamic force in the wing deformation will be discussed.

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