

MEASUREMENTS AROUND INSECT WINGS

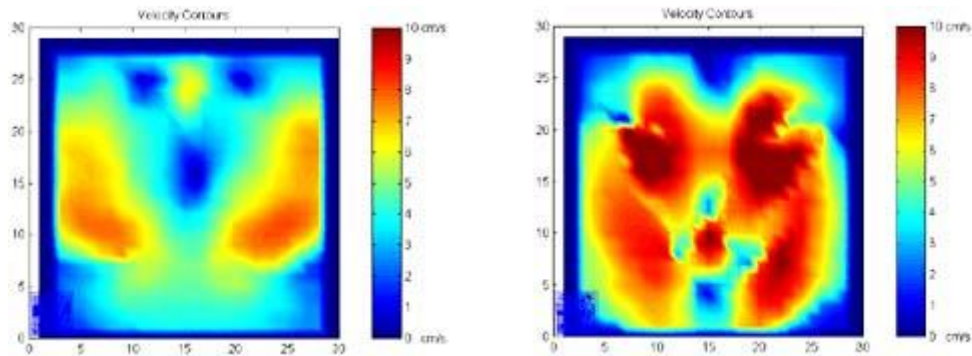
APPLICATION NOTE PIV-004

Courtesy University of California, Berkeley

The aerodynamics associated with the flight of small insects has always been intriguing. Because their wings do not generate enough steady-state lift, it has been argued that the transient forces developed during flapping must be key to their flight.

To study these and other aspects relating to small insect flight, a Plexiglas model of the fruit fly *Drosophila melanogaster* was built. The model was immersed in mineral oil to maintain the correct Reynolds number. The wings were motorized to both flap and rotate in the same way as the real fruit-fly wings.

The velocity field around the wings was measured using a PowerView™ PIV system. A PIVCAM 10-30 camera was used to capture the images generated by the light sheet from a pulsed Nd:YAG laser.



The figures show the velocity vector fields of the flow around the wings as they "clap together" at the top of the stroke and as they "fling apart" at the beginning of the downstroke.





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