

Abstract Submitted
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Falling with Style - Bat flight maneuvers ATTILA BERGOU, Brown University, DANIEL RISKIN, City College New York, GABRIEL TAUBIN, SHARON SWARTZ, KENNETH S. BREUER, Brown University — The remarkable maneuverability of flying animals results from precise movements of their highly specialized wings. Among these flyers, bats have evolved a particularly impressive capacity to control their flight. This adeptness is, in part, determined by bats' ability to modulate their wing shape through many independently controlled joints. However, the many-jointed wings of bats have higher inertia relative to their bodies compared with all other extant flyers. To understand the role that wing inertia plays in bat flight, we use a novel tracking algorithm to measure the kinematics of bats performing aerial flips. Using a dynamical model of a flying bat, we show how bats modulate their wings' inertia, usually a detriment to maneuvering, to supplement aerodynamic forces in performing flight maneuvers.

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