

Abstract Submitted  
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**Aerodynamics of compliant membrane wings as related to bat and other mammalian flight** ARNOLD SONG, KENNETH BREUER, Brown University — The wings of mammalian flyers and gliders, such as bats or flying squirrels, are characterized by a compliant skin membrane stretched over a thin skeletal support structure. These unique wing structures lead to aeroelastic behavior that is quite distinct from that observed in birds or insects. We present experimental results on the aerodynamic and fluid mechanical behavior of model compliant wings fabricated using both isotropic and anisotropic membrane materials. Unsteady aerodynamic forces are measured simultaneously with time-resolved PIV of the surrounding flow field, illustrating the relationship between the two and the role of vortex shedding on the overall behavior.

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