

Abstract Submitted  
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**Kinematics, Power, and Optimization in Hovering Insect Flight**

GORDON BERMAN, Cornell University, Dept. of Physics, Z. JANE WANG, Cornell University, Dept. of Theoretical and Applied Mechanics — Insects are graceful and varied locomotors – flying, darting, and hovering with remarkable ease. But are they efficient? By determining the forces acting on a wing for a prescribed motion via a quasi-steady model of fluid forces on a thin plate, we run optimization algorithms to find the optimal wing motion that an insect can make. A common belief is that animals move in a way that minimizes their metabolic cost. We test this hypothesis by comparing the results of our optimization with empirically measured data.

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