

Abstract Submitted
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Combining spanwise morphing, inline motion and model based optimization for force magnitude and direction control JOHANNES SCHELLER, MIT, MARIANNA BRAZA, IMFT, MICHAEL TRIANTAFYLLOU, MIT — Bats and other animals rapidly change their wingspan in order to control the aerodynamic forces. A NACA0013 type airfoil with dynamically changing span is proposed as a simple model to experimentally study these biomimetic morphing wings. Combining this large-scale morphing with inline motion allows to control both force magnitude and direction. Force measurements are conducted in order to analyze the impact of the 4 degree of freedom flapping motion on the flow. A blade-element theory augmented unsteady aerodynamic model is then used to derive optimal flapping trajectories.

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None

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