

Abstract Submitted  
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**Flexible wings in flapping flight** LIONEL MORET, BENJAMIN THIRIA, JUN ZHANG, New York University, APPLIED MATH LABORATORY TEAM — We study the effect of passive pitching and flexible deflection of wings on the forward flapping flight. The wings are flapped vertically in water and are allowed to move freely horizontally. The forward speed is chosen by the flapping wing itself by balance of drag and thrust. We show, that by allowing the wing to passively pitch or by adding a flexible extension at its trailing edge, the forward speed is significantly increased. Detailed measurements of wing deflection and passive pitching, together with flow visualization, are used to explain our observations. The advantage of having a wing with finite rigidity/flexibility is discussed as we compare the current results with our biological inspirations such as birds and fish.

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