

Abstract Submitted  
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**A Simple Computational Model of a jellyfish-like flying machine** FANG FANG, LEIF RISTROPH, MICHAEL SHELLEY, Applied Math Lab, Courant Institute, NYU — We explore theoretically the aerodynamics of a jellyfish-like flying machine recently fabricated at NYU. This experimental device achieves flight and hovering by opening and closing a set of flapping wings. It displays orientational flight stability without additional control surfaces or feedback control. Our model machine consists of two symmetric massless flapping wings connected to a body with mass and moment of inertia. A vortex sheet shedding and wake model is used for the flow simulation. Use of the Fast Multipole Method (FMM), and adaptive addition/deletion of vortices, allows us to simulate for long times and resolve complex wakes. We use our model to explore the physical parameters that maintain body hovering, its ascent and descent, and investigate the stability of these states.

Michael Shelley  
Applied Math Lab, Courant Institute, NYU

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