

Abstract Submitted
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Flapping-wing mechanical butterfly on a wheel¹ RAMIRO GODOY-DIANA, BENJAMIN THIRIA, DANIEL PRADAL, PMMH UMR7636 CNRS; ESPCI; PARIS 6; PARIS 7 — We examine the propulsive performance of a flapping-wing device turning on a “merry-go-round” type base. The two-wing flapper is attached to a mast that is ball-bearing mounted to a central shaft in such a way that the thrust force produced by the wings makes the flapper turn around this shaft. The oscillating lift force produced by the flapping wings is aligned with the mast to avoid vibration of the system. A turning contact allows to power the motor that drives the wings. We measure power consumption and cruising speed as a function of flapping frequency and amplitude as well as wing flexibility. The design of the wings permits to change independently their flexibility in the span-wise and chord-wise directions and PIV measurements in various planes let us examine the vorticity field around the device. A complete study of the effect of wing flexibility on the propulsive performance of the system will be presented at the conference.

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Jose Eduardo Wesfreid
PMMH UMR7636 CNRS; ESPCI; PARIS 6; PARIS 7

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