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# Physics of unsteady thrust and flow generation by a flexible surface flapping in the absence of free stream: Media Summary

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Inspired by the flexible wings and fins of flying and swimming animals, we investigate the mechanism of flow and thrust generated by a flapping flexible surface in hover-like situation. Our analysis reveals that the orderly, narrow vortex jet and the associated thrust generated in an otherwise quiescent ambient is a two-dimensional analog of the three-dimensional flow structure in natural hovering; however, the mechanism is simple and different from the 'standard' mechanisms in birds and insects. We show that flexibility induces 'unsteady actuator disk (thin disk accelerating fluid by adding momentum-energy)' type action like the 'pulsed actuator disk' model (1984) proposed for hovering insects. Flapping flexible surfaces can have applications in electronic and room cooling.