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Influence of flexibility and corner shape on three-dimensional vortex structures in translating plates[1] DAEGYOUM KIM, MORTEZA GHARIB, California Institute of Technology — In order to understand the complicated vortex formation process of the flexible propulsors in nature, three-dimensional vortex structures generated by impulsively translating low aspect-ratio plates with a 90° angle of attack were studied experimentally. Rigid and flexible thin plastic plates were used to find the effect of plate flexibility on the development of vortex structure. The tip vortex motion is one of the obvious differences between the rigid and flexible plates. While the tip vortex moves upward in the flat-rigid plate case, it stays near the tip in the flexible plate case, which results in significantly different three-dimensional vortex morphology near the tip region. In addition, the dynamics of the vortex near a corner region was compared among three different corner angles for impulsively translating plates.

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Daegyoum Kim
California Institute of Technology

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