

Abstract Submitted
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Stability of low aspect ratio inverted flags and rods in a uniform flow¹ CECILIA HUERTAS-CERDEIRA, California Institute of Technology, JOHN E. SADER, The University of Melbourne, MORTEZA GHARIB, California Institute of Technology — Cantilevered elastic plates and rods in an inverted configuration, where the leading edge is free to move and the trailing edge is clamped, undergo complex dynamics when subjected to a uniform flow. The stability of low aspect ratio inverted plates and rods is theoretically examined, showing that it is markedly different from that of their large aspect ratio counterpart. In the limit of zero aspect ratio, the undeflected equilibrium position is found to be stable for all wind speeds. A saddle-node bifurcation emerges at finite wind speed, giving rise to a strongly deflected stable and a weakly deflected unstable equilibria. This theory is compared to experimental measurements, where good agreement is found.

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