

Thrust enhancement of oscillating foils

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Abstract

Experiments on panels pitching and heaving in a water channel are reported. The panels are rigid, of rectangular planform shape, and the flow is nominally two-dimensional. Such experiments are used as a model of fish swimming. Through the use of Jacobi elliptic functions, we are able to actuate the panels in non-sinusoidal and asymmetric motions; we investigate how such motions affect the propulsive performance of the panels. Direct force measurements are taken using a six component force/torque sensor, and certain cases are supplemented with two-dimensional particle image velocimetry (PIV) taken at the mid-span of the panel; efficiency measurements are also reported.