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Wake interactions of panels swimming in a side-by-side configuration[1] BIRGITT BOSCHITSCH, PETER A. DEWEY, KEITH W. MOORED, ALEXANDER J. SMITS, Princeton University — A pair of pitching panels arranged in a side-by-side configuration are experimentally examined under free swimming conditions. The panels were pitched about their leading edges by shafts located just behind the trailing edge of a NACA 0012-64 airfoil to suppress the formation of leading edge vortices. A recirculating water channel is set with a flow speed that matches the free swimming speed of the panel system. Power measurements are used to determine the energy consumption of the panel system per distance traveled. Finite and infinite aspect ratio panels are examined for a range of Strouhal numbers, transverse panel spacings, and oscillation phase shifts between the two panels. It is found that under certain operating conditions, a pair of panels maintain a higher free swimming velocity in comparison to a single isolated panel. To assess the wake generated by the panels, digital particle image velocimetry (DPIV) and hydrogen bubble visualization are used.

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