Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

**Simulations of the burst and coast swimming behavior of fish**[1] QUAN ZHOU, Princeton University, KEITH MOORED, Lehigh University, ALEXANDER SMITS, Princeton University, Monash University — An investigation into the burst and coast swimming behavior of fish is simulated with a 2-D, inviscid Boundary Element Method. The fish is modeled as a thin pitching panel that is allowed to free swim. A simple drag model is used where drag is proportional to the velocity squared in order to calculate the cruising velocity. The burst-coast behavior is modeled by a coasting phase, where the panel is motionless, and a burst phase, where the panel pitches with a single sine wave motion. Varying the frequency of the fin-beat and the duration of the duty cycle (the ratio of the burst-phase to the entire period), it is found that it is possible to alter swimming motion to yield a decrease of 50% in the cost of transport with no sacrifice of time-averaged cruising velocity. The analyses of the wake structure demonstrate how vortices shed by the fish affect and shape swimming dynamics.

[1]Supported by the Office of Naval Research under Program Director Dr. Bob Brizzolara, MURI grant number N00014-08-1-0642.

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Date submitted: 02 Aug 2013 Electronic form version 1.4