Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

Locomotion and Body Shape Changes of Metabolically Different *C.elegans* in Fluids with Varying Viscosities RACHEL WONG, University of Washington, NOAH BRENOWITZ, NYU, AMY SHEN, University of Washington — *Caenorhabditis elegans* (*C.elegans*) are soil dwelling roundworms that have served as model organisms for studying a multitude of biological and engineering phenomena. On agar, the locomotion of the worm is sinusoidal, while in water, the swimming motion of the worm appears more episodic. The efficiency of the worm locomotion is tested by placing the worm in four fluids with varying viscosities. We quantify the locomotion pattern variations by categorizing the swimming kinematics and shapes of the *C.elegans*. The locomotion of two mutants *C.elegans* and a control *C.elegans* was tested: *daf2*, *nhr49*, and $N2$ *Wildtype*. The metabolic effects of the worms are evaluated by focusing on the forward swimming velocity, wavelength, amplitude and swimming frequency were compared. Using these measured values, we were able to quantify the efficiency, the speed of propagation of the wave along the body resulting in forward movement (wave velocity), and transverse velocity, defined as the amplitude times the frequency, of the worm locomotion. It was shown that *C.elegans* has a preferential swimming shape that adapts as the environment changes regardless of its efficiency.

Rachel Wong

Date submitted: 23 Jul 2010 Electronic form version 1.4