Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Improving propulsive efficiency through passive mechanisms using a Starling vortex generator[1] ROBERT WHITTLESEY, JOHN DABIRI, California Institute of Technology — Ruiz et al. (2011) demonstrated that pulsed propulsion with vortex rings, much like those seen in the wake of jellyfish and squid, can greatly enhance the overall efficiency of submersible vehicles. The objective of the present research is to achieve pulsed propulsion passively using a Starling vortex generator which consists of a collapsible tube within an airtight box. Recent work has shown that a Starling vortex generator is able to generate vortex rings, which indicates enhanced propulsion, while requiring less energy to generate pulsatility than the system by Ruiz et al. (2011). Current work is focused on conducting an experimental parameter study to determine an empirical scaling law suitable for design purposes, with the aim to integrate the device into a full-scale unmanned undersea vehicle.

[1]Support is greatly appreciated from ONR Awards N000140810918 and N000141010137.

Robert Whittlesey
California Institute of Technology

Date submitted: 05 Jul 2011 Electronic form version 1.4