

Abstract Submitted
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Swimming of a Subtropical Soft-bodied Sea Angel at Intermediate Reynolds Number¹ DAVID MURPHY, FERHAT KARAKAS, Univ of South Florida, AMY MAAS, Bermuda Institute of Ocean Sciences — Gymnosomatous pteropods, also known as sea angels, are shell-less planktonic marine snails which swim by flapping a pair of low aspect ratio, highly flexible wing-like parapodia. Locomotion is important for sea angels as these animals must swim to prey on shelled pteropods and to maintain their position in the water column. However, little is known about the fluid dynamics of their swimming as no flow measurements have previously been acquired. Here we present high speed stereophotogrammetry and novel time-resolved 2D micro-PIV measurements of a subtropical sea angel, *Pneumoderma atlantica*, acquired in Bermuda. The collected animals have body lengths up to 13.1 mm, wing spans up to 5.2 mm, beat their wings at frequencies up to 4.3 Hz, and swim upwards in sawtooth trajectories at speeds up to 34 mm/s, thus placing them at an intermediate Reynolds numbers of approximately 400. Three-dimensional wing and body kinematics show that this species performs a version of the cylindrical overlap-and-fling maneuver by pulling its wings close to its body at the end of each power and recovery stroke. We further compare the swimming of this warm water species with the sea angels *Clione limacina* and *Clione antarctica* which live in temperate and polar climates, respectively.

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