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Numerical simulations of bell contractions of upside down jellyfish using the immersed boundary method CHRISTINA HAMLET, LAURA MILLER, University of North Carolina-Chapel Hill — Pulsatile jet propulsion is one of the simplest forms of locomotion utilized by macroscopic organisms. Jellyfish use contractions of their bells to form vortex rings that facilitate feeding and locomotion. Once they grow to about 2 cm in diameter, the upside-down jellyfish (genus Cassiopea) situates itself on the ocean substratum with its oral arms towards the sun. These organisms primarily utilize zooanthellae for photosynthetic feeding, while also pulsing their bells to generate feeding currents and to move short distances. Preliminary numerical simulations are presented here which model the motion of the jellyfish as they pulse on the ocean floor. The motion of the bell is measured and fit to a mathematical model using video. The bell motion is used as an input in numerical simulations. Ultimately, contraction of muscle fibers which induce bell contractions will be simulated across Reynolds numbers using the immersed boundary method.

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