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Geometric and Dynamic Scaling of Marine Snail Swimming FERHAT KARAKAS, Univ of South Florida, AMY MAAS, Bermuda Institute of Ocean Sciences, DAVID MURPHY, University of South Florida — Pteropods are holoplanktonic marine snails which swim by flapping their highly flexible pair of wings. Shelled pteropods are highly negatively buoyant as compared to shell-less pteropods. Swimming is essential for pteropod survival as these animals must escape from predators and perform diel vertical migration. Different pteropod species have different shell shapes and sizes, are distributed in tropical, temperate, and polar oceans around the world, and have significant ecological and biogeochemical impact. However, the effects of pteropod shell presence, shape, and size on swimming are not well studied. Here we acquire high speed stereophotogrammetry measurements of the swimming of seven shelled and one shell-less subtropical pteropod species. Using these data and previously measured data for temperate and polar species, we investigate the relationship among parameters such as size, flapping frequency, and seawater viscosity (which corresponds to temperature), translational Re, flapping Re, and Strouhal number. For four different pteropod species with coiled shells operating across seawater viscosities which differ by a factor of almost 2, beat frequency is inversely related to animal size and to water viscosity and the Strouhal number is found to lie between 0.2 and 0.4.

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