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Quiet swimming at low Reynolds number ANDERS ANDERSEN, NAVISH WADHWA, Department of Physics and Centre for Ocean Life, Technical University of Denmark, THOMAS KIORBOE, National Institute for Aquatic Resources and Centre for Ocean Life, Technical University of Denmark — Planktonic organisms that inhabit the water masses of the oceans are faced with a dilemma: They need to swim to find food and mates, but by swimming they inevitably create flow disturbances that attract predators. We discuss that planktonic swimmers can reduce the flow disturbances due to their swimming, simply by appropriately arranging their propulsion apparatus. Motivated by recent experiments, we demonstrate that a three-Stokeslet model of a breast stroke swimmer is an example of a quiet swimmer. We show that the flow disturbances around the organism in both the near field and the far field are small in comparison with simple pullers and pushers, and we find that the far field power laws are valid surprisingly close to the organism. Breast stroke swimming may thus be advantageous, and this might explain why it is very common in the world of the plankton.

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