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Local fluid transport by planktonic swarms MONICA MARTINEZ-ORTIZ, California Institute of Technology, JOHN DABIRI, Graduate Aeronautical Laboratories and Bioengineering, California Institute of Technology — Energy transport in the ocean occurs through an intricate set of pathways mainly powered by physical phenomena. The hypothesis that vertical migrations of aquatic fauna may contribute to this process through the action of the induced drift mechanism has been investigated in recent years. Microscale measurements by Kunze et al (1), in Saanich Inlet have shown the presence of high kinetic energy dissipation rates in the vicinity of vertically migrating krill swarms. However, it remains uncertain if energy is being introduced at scales large enough to induce the transport of fluid across surfaces of equal density. Within this context, the present study aims to provide experimental insight of fluid transport by planktonic swarms. The vertical migration of Artemia salina is triggered and controlled by means of a system of stationary and translating luminescent signals. High speed flow visualizations elucidate the competing effects of upward drift by the passive sections of the organisms and downward flow induced by the appendages. The resulting fluid transport is assessed by using PIV at different stages of the migration. The kinetic energy spectrum is computed using velocity correlation functions to determine the length scales at which the animals introduce energy to the flow.

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