Abstract Submitted
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Fluid transport by an unsteady microswimmer[1] PETER MUELLER, JEAN-LUC THIFFEAULT, University of Wisconsin - Madison — We study the drift caused by the microscopic algae *Chlamydomonas reinhardtii*, which swims by rapidly beating two frontal flagella. Previous studies of transport by microswimmers have neglected the ubiquitous time-dependence of their swimming. We model the organism by a time-dependent dumbbell consisting of a solid body and a regularized Stokeslet. We then analyze individual particle paths and their displacements in a region around the swimmer. Of particular interest are particles near the swimmer, which have complex trajectories due to the unsteady model. Particles directly in front of the swimmer contribute large, but rare, displacements. We use this to determine the tails of the distribution of particle displacements. Finally we compare the effective diffusivity of varying particle sizes to gauge the importance of time-dependence on overall fluid transport and mixing.

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Peter Mueller
University of Wisconsin - Madison

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