

Abstract Submitted
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Distribution of particle displacements due to swimming microorganisms¹ JEAN-LUC THIFFEAULT, University of Wisconsin - Madison — The experiments of Leptos et al. [*Phys. Rev. Lett.* **103**, 198103 (2009)] show that the displacements of small particles affected by swimming microorganisms achieve a non-Gaussian distribution, which nevertheless scales diffusively. We use a simple model where the particles undergo repeated “kicks” due to the swimmers to explain the shape of the distribution as a function of the volume fraction of swimmers. The net displacement is determined by the self-convolution of the drift function caused by one swimmer, and a Poisson distribution for the frequency of interactions. The only adjustable parameter is the strength of the stresslet term in our spherical squirmer model. The effective diffusivity measured in the experiments is consistent with the model, with no further parameter adjustments.

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