

Abstract Submitted
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Random flow induced by swimming algae VASILY KANTSLEER, ILIA RUSHKIN, RAYMOND GOLDSTEIN, DAMTP, UNIVERSITY OF CAMBRIDGE TEAM — In this work we studied the random flow induced in a fluid by the motion of a dilute suspension of the swimming algae *Volvox carteri*. The fluid velocity in the suspension is a superposition of the flow fields set up by the individual organisms, which in turn have multipole contributions that decay as inverse powers of distance from the organism. Here we show that the conditions under which the central limit theorem guarantees a Gaussian probability distribution function of velocity fluctuations are satisfied when the leading force singularity is a Stokeslet. Deviations from Gaussianity are shown to arise from near-field effects. Comparison is made with the statistical properties of abiotic sedimenting suspensions. The experimental results are supplemented by extensive numerical studies.

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