

Abstract Submitted
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Experimental investigation of pair-wise interactions between *Chlamydomonas reinhardtii*¹ JUNAID MEHMOOD, KOEN MULLER, ABEL-JOHN BUCHNER, DANIEL TAM, Delft University of Technology — Collective dynamics arise in suspensions of motile micro-organisms and is relevant to such biological processes as reproduction and biofilm formation. Such collective motion is thought to arise from the mechanical interactions between motile cells. The nature of these interactions has been investigated previously, to determine the relevance of long range hydrodynamic interactions and short range steric interactions to the emergence of collective motion. In this work, we use a unique multi-camera microscopy set-up to track green alga *Chlamydomonas reinhardtii* in a dilute suspension. The flow cells used in the experiment are approximately two hundred times the size of one cell. This allows the cells to swim freely in all directions. Three dimensional Lagrangian tracking is performed by using projective geometry and supports the reconstruction of the cell trajectories within one cell radius accuracy. We characterize the interactions between two cells coming within close range. The resulting trajectories provide data by which to examine the pair-wise interactions between two swimming cells. These interactions are discussed in terms of the relevant length and time scale and change in swimming direction.

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