

Abstract Submitted
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Experimental investigation of hydrodynamic interactions between motile green algae¹ JUNAID MEHMOOD, ABEL-JOHN BUCHNER, KOEN MULLER, DANIEL TAM, Delft University of Technology — The motility of micro-organisms plays a crucial role in many biological processes, such as reproduction and biofilm formation. Mechanical interactions between swimming cells can lead to collective phenomena, e.g., bio-convention or pattern formation. Hydrodynamic interactions between swimming cells have been the focus of several numerical studies, but experimental evidence of intercellular hydrodynamic interaction remains scarce. Here, we use a unique multi-camera microscopy set-up to track a dilute suspension of the model green alga *Chlamydomonas reinhardtii*. The cells are free to swim within a flow cell, which does not constrain their dynamics. The resulting three-dimensional trajectories provide data by which to examine pair-wise interactions between the motile cells. Hydrodynamic interactions can lead to a change in direction or velocity magnitude. This information is used to find out the length and time scale for which interaction is occurring between the pair of swimmers. We also study the velocity correlations between all the swimmers to find out the extent of length and time scale associated with these interactions.

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