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Hydrodynamic dispersion of microswimmers in suspension MATTHIEU MARTIN[1], SALIMA RAFAÏ, PHILIPPE PEYLA, LIPhy - CNRS, Univ. Grenoble — In our laboratory, we study hydrodynamics of suspensions of micro-swimmers. These micro-organisms are unicellular algae Chlamydomonas Rheinhardii which are able to swim by using their flagella. The swimming dynamics of these micro-swimmers can be seen as a random walk, in absence of any kind of interaction. In addition, these algae have the property of being phototactic, i.e. they swim towards the light. Combining this property with a hydrodynamic flow, we were able to reversibly separate algae from the rest of the fluid. But for sufficiently high volume fraction, these active particles interact with each other. We are now interested in how the coupling of hydrodynamic interactions between swimmers and phototaxis can modify the swimming dynamics at the scale of the suspension. To this aim, we conduct experiments in microfluidic devices to study the dispersion of the micro-organisms in a the liquid phase as a function of the volume fraction. We show that the dispersion of an assembly of puller type microswimmers is quantitatively affected by hydrodynamics interactions.

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