

Abstract Submitted  
for the DFD12 Meeting of  
The American Physical Society

**Flow of active suspensions and biased swimming**<sup>1</sup> SALIMA RAFAI, PHILIPPE PEYLA, XABEL GARCIA, GUNTARS KITENBERGS, MICHAËL GARCIA, CNRS/Grenoble University, LIPHY TEAM — It is a challenge to understand the hydrodynamics associated with individual or collective motion of microswimmers through their fluid-mediated interactions in order for instance to manipulate the cells efficiently for some applications purposes. The motion of these micro-organisms can be often affected by the presence of gradients leading to a biased random walk (chemotaxis in the presence of chemicals, gyrotaxis in a gravity field, phototaxis under light exposure). In this study, we present our experimental results concerning the coupling of a Poiseuille flow with the biased random walk of *Chlamydomonas Reinhardtii*, a green unicellular micro-alga. This is done by illuminating the microswimmer suspension while flowing in a microchannel device. We show that one can obtain a spontaneous and reversible migration and separation of the microalgae suspension from the rest of the suspending medium under illumination and then dynamically control the concentration of the suspension with light. We present a simple model that accounts for the observed phenomenon.

<sup>1</sup>We thank the ANR MOSICOB and MICMACSWIM.

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Date submitted: 24 Jul 2012

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