



ESPCI
Laboratoire PMMH
10 rue Vauquelin, 75231 Paris Cedex 05



Séminaire PMMH

Bureau d'Études, Bâtiment L, 2^{ème} étage

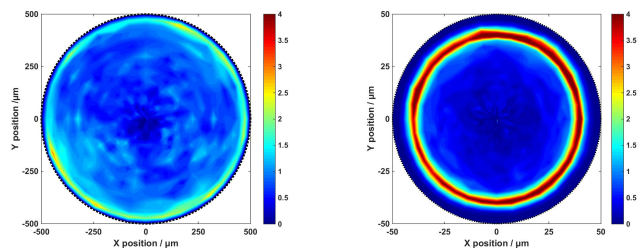
Vendredi 27 novembre 2015, 11h00-12h00

Oliver Baümchen

Max Planck Institute, Göttingen

Active Fluids at Interfaces : Confinement and Adhesion of Microswimmers in Microfluidic Compartments

The characteristics of active fluids, such as suspensions of biological microswimmers, may not only originate from the mutual interactions between the constituents, but also from interactions with interfaces and confining walls. In fact, the natural habitats of many living organisms are complex geometric environments, rather than bulk situations. In addition, the confinement and exposure to solid/liquid interfaces plays an important role with regard to the adhesion of cell populations and, subsequently, the formation of biofilms in natural and artificial environments. The influence of interfaces on the dynamics was recognised as an important factor, and there are differences in the way that pusher-type swimmers (e.g. the bacteria *E. coli*) and puller-type swimmers (e.g. green alga *C. reinhardtii*) behave close to interfaces. Using microfluidic experiments, we report on the dynamics of single puller-type swimmers in 2D circular chambers. We find that the radial probability distribution of trajectories displays a characteristic wall hugging effect, where swimmers remain trapped at a concave interface for decreasing chamber size. In the vicinity of this concave wall, an alignment of the local swimming direction with the local wall tangent is observed. In contrast, the swimmers tend to scatter off convex interfaces with short interaction times. Based on geometric arguments, we explain this entrapment effect at concave interfaces. Finally, we will also present novel experimental results on the measurement of adhesion forces of flagellated microswimmers at solid walls.



Prochain séminaire : vendredi 4 décembre, Michaël Benzaquen (PCT, Gulliver, ESPCI)

Programme des séminaires : www.pmmh.espci.fr, onglet *Séminaires PMMH*

Contact : Ramiro Godoy-Diana, Étienne Reyssat, seminaires@pmmh.espci.fr