Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

Hydrodynamics of Microswimmers Trapped at Fluid-Fluid Interfaces NICHOLAS CHISHOLM, KATHLEEN STEBE, University of Pennsylvania — Microswimmers on or near fluid interfaces have pronounced changes in their motion, in their interactions with neighboring colloids, and in their collective behaviors. These motions and interactions can be harnessed to direct colloid assembly or alter interfacial transport conditions. However, the manner in which a fluid interface alters microswimmer motion is not yet understood. To address this gap, we develop a flow singularity model to identify leading order modes for active colloids on interfaces in the limit of small Reynolds and capillary numbers. We discuss a "clean" interface in which there is no jump in tangential stresses at the interface. We also consider an incompressible interface, as is typical for colloids on interfaces in the presence of surfactant. Thereafter, we examine interactions between a microswimmer and passive "tracer" particles for two microswimmer trajectory types: swimming in a straight line or in circular paths. These results will be useful in future work on the use of active colloids to direct and enhance transport at interfaces.

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Date submitted: 01 Aug 2019 Electronic form version 1.4