

Abstract Submitted  
for the DFD15 Meeting of  
The American Physical Society

**Numerical study of the hydrodynamic interactions in an *E-coli* suspension** XINLIANG XU, Beijing Computational Science Research Center — The active suspension of *E-coli* displays many interesting non-equilibrium phenomena, e.g. “swarming” at high bacteria concentrations, and viscosity change under simple shear. To understand the microscopic mechanism underlying these phenomena requires detailed knowledge about the hydrodynamics within the suspension. Here we numerically study in detail the hydrodynamic interactions between a bacterium and an ellipsoid tracer at small separations, where the tracer can no longer be treated as a point-like particle that creates no disturbance to local flow field. Based on Purcell’s *E-coli* model, we observed a significant drop in bacterium swimming velocity, in agreement with previous experimental study.

Xinliang Xu  
Beijing Computational Science Research Center

Date submitted: 01 Aug 2015

Electronic form version 1.4