

Abstract Submitted  
for the DFD20 Meeting of  
The American Physical Society

**Bacterial motion and spread in porous media** YASSER ALMOTERI, ENKELEIDA LUSHI, New Jersey Inst of Tech — We will present a continuum model that describes the collective dynamics of micro-swimmers such as bacteria through a porous wet material. The motion of the swimmer suspension is coupled to the fluid dynamics that is modeled through a Stokes-Brinkman equation with an added active stress. The linear stability of the uniform isotropic state reveals that the suspension transitions from a long-wave instability to a mid-range one where the collective bacterial chaotic motion is weakened. Simulations of the full nonlinear system confirm the analytical results. We discuss the spread of an initial accumulation of bacteria and show the speed of the resulting waves depends non-trivially on the medium porosity. Lastly, we will discuss the dynamics of a bacterial suspension through a structured surface.

Enkeleida Lushi  
New Jersey Inst of Tech

Date submitted: 03 Sep 2020

Electronic form version 1.4