Abstract Submitted
for the DFD20 Meeting of
The American Physical Society

Shepherding bacterial flocks: Controlling active suspensions through orientable agents RICHARD HENSHAW, JEFFREY GUASTO, Tufts University — Understanding how large numbers of individual active agents, such as flocks, schools, and swarms of organisms, organise their collective motion in response to changes in the local environment remains a prominent open question in active matter. Focusing on bacterial turbulence in dense suspensions of *Bacillus subtilis*, we investigate the ability of a comparatively small number of magnetic agents to influence the transport properties of the active suspension. A range of different aspect ratio magnetic agents, including immobilised spherical particles and rod-like magnetotactic bacteria (*Magnetospirillum magneticum*, AMB-1), are mixed into dense suspensions of *B. subtilis*, where the motion of the flow fields and individual particles are measured by PIV and particle tracking, respectively. Changes in the structure and spatiotemporal fluctuations of the bacterial turbulence are quantified under a variety of magnetic field strengths. We find that the magnetic torque imposed by non-spherical agents imparts significant anisotropy to the active suspension, thereby linking the large-scale collective behavior to the single cell level interactions.

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Date submitted: 10 Aug 2020 Electronic form version 1.4