Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Fluid dynamics in biological active nematics[1] AMANDA TAN, LINDA HIRST, University of California, Merced — We use biological materials to form a self-mixing active system that consists of microtubules driven by kinesin clusters. Microtubules are rigid biopolymers that are a part of the cytoskeleton. Kinesin motors are molecular motors that walk along microtubules to transport cellular cargo. In this system, microtubules are bundled together, and as the kinesin clusters walk along the filaments, the microtubule bundles move relative to each other. As microtubules shear against each other, they extend, bend, buckle and fracture. When confined in a 2D water-oil interface, the system becomes an active nematic that self-mixes due to the buckling and fracturing. To quantify this self-mixing, we attached beads to the microtubules, and tracked their motion. We quantify the quality of mixing using the bead trajectories. This new active material has potential applications as a self-mixing solvent.

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Date submitted: 14 Nov 2016 Electronic form version 1.4