

Abstract Submitted
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Simultaneous 3D tracking of passive tracers and microtubule bundles in an active gel¹ YI FAN, KENNETH S. BREUER, School of Engineering, Brown University, FLUIDS TEAM — Kinesin-driven microtubule bundles generate a spontaneous flow in unconfined geometries. They exhibit properties of active matter, including the emergence of collective motion, reduction of apparent viscosity and consumption of local energy. Here we present results from 3D tracking of passive tracers (using Airy rings and 3D scanning) synchronized with 3D measurement of the microtubule bundles motion. This technique is applied to measure viscosity variation and collective flow in a confined geometry with particular attention paid to the self-pumping system recently reported by Wu et al. (2016). Results show that the viscosity in an equilibrium microtubule network is around half that of the isotropic unbundled microtubule solution. Cross-correlations of the active microtubule network and passive tracers define a neighborhood around microtubule bundles in which passive tracers are effectively transported.

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