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**The mobility of individual filaments in microtubule and actin bundles** DAVID WELCH, ANDREW WARD, TIMOTHY SANCHEZ, EDWARD BARRY, ZVONIMIR DOGIC, Brandeis University — Friction between biopolymers is not well understood. We investigated the mobility of individual filaments in actin and microtubule based bundles. We find that microtubules, bundled under the influence of low concentrations of depleting agent, slide with respect to each other due to thermal effects. Using darkfield microscopy and filament-tracking software we analyzed this sliding as 1-dimensional diffusion. Our analysis reveals that this process is subdiffusive, likely due to a stick-slip mechanism. In contrast, actin filaments within a bundle do not exhibit any sliding motion. We therefore used laser tweezers to actively pull actin filaments past each other at a constant velocity. The resulting data showed that force scales linearly with velocity and overlap length of the filaments.

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