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**Effect of active kinesin density on microtubules during formation of spools** AMANDA TAN, University of California Merced, DAIL CHAPMAN, University of California Irvine, LINDA HIRST, JING XU, University of California Merced — Active self-assembly systems are energy driven and can organize into various structures. Microtubules and their associated motor proteins, such as kinesin, are widely used to study active self-assembly of higher order structures, such as linear bundles and spools. Microtubules are polymers composed of tubulin that are found in the cytoskeleton. Kinesin motors convert ATP into energy through hydrolysis and walk along microtubules. Microtubules functionalized with biotin and streptavidin will bind together and form bundles and spools when gliding. The spools are able to maintain its shape and continue to rotate in the presence of ATP. We use gliding assays to investigate the effect of the density of active motors on microtubules during spool formation. By tuning the velocity of gliding microtubules, we can effectively tune the kinesin density on microtubules. There was no significant change in average spool circumference and no reduction in spool density over a 10-fold reduction in microtubule gliding velocity. We find spool characteristics are robust against active kinesin density on microtubules.

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