Title:	Forced desorption of semiflexible polymers, adsorbed and driven by molecular motors
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Abstract:	We formulate and characterize a model to describe the dynamics of semiflexible polymers in the presence of activity due to motor proteins attached irreversibly to a substrate, and a transverse pulling force acting on one end of the filament. The stochastic binding–unbinding of the motor proteins and their ability to move along the polymer generate active forces. As the pulling force reaches a threshold value, the polymer eventually desorbs from the substrate. Performing underdamped Langevin dynamics simulation of the polymer, and with stochastic motor activity, we obtain desorption phase diagrams. The correlation time for fluctuations in the desorbed fraction increases as one approaches complete desorption, captured quantitatively by a power law spectral density. We present theoretical analysis of the phase diagram using mean field approximations in the weakly bending limit of the polymer and performing linear stability analysis. This predicts an increase in the desorption force with the polymer bending rigidity, active velocity and processivity of the motor proteins to capture the main features of the simulation results.
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