

Abstract Submitted  
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**Dynamics of polarly driven filaments**<sup>1</sup> MICHAEL SHELLEY, New York University, YUAN-NAN YOUNG, New Jersey Institute of Technology — In this study we investigate the dynamics and transport of bio-polymers such as microtubules or actin filaments when driven by motor proteins. A slender-body hydrodynamic formulation is augmented by a model for the forcing from the motor proteins. Our results show that the spatial gradients in the polar forcing, or the detachment of the filament from the motor proteins, can lead to nontrivial shape dynamics (undulatory traveling waves), and random walk trajectories. The interaction between filament and the simple device geometries is investigated, as is the effect of thermal fluctuations.

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