

I. Introduction

A. Introduction to active matter and the cytoskeleton

Motivation for research and applications related to the subject.

B. Review of semi-flexible networks

Technical background on semi-flexible polymer physics

C. Review of cross-linking models

Technical background on generally accepted models of transient cross links.

D. Review of active motor models

Technical background on molecular motor models.

II. Molecular friction model of transient cross-linking

A. Explanation of Model

Explain how the model works.

B. Analytical Results

Go over main points

1. Linear approximation

2. Corrections for alignment and flexibility

3. Rate of thinning in extension

4. Timescale of network breakdown

C. Simulation Details

Broadly explain how simulations were carried out

D. Simulation Results

Show comparisons between expectation and simulation result

E. Possible Appendices

Compare with more detailed simulations, compare with experiments, derive friction coefficient and bring up nonlinearities, more simulation details

III. Active friction model of molecular motor activity

A. Explanation of model

B. Analytical Work

C. Simulation Comparisons

IV. Simulations of network rearrangement and tearing in active friction networks

A. Simulation Results

B. ?

C. ?