Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Mechanical Properties of Actin Networks near the Polymerization Transition[1] ANDREW POMERANCE, University of Maryland, ERIN RERICHA, University of Maryland, WOLFGANG LOSERT, University of Maryland — Here we present studies of the mechanical properties of actin networks close to the polymerization transition. In the presence of divalent ions, the critical concentration (CC) for polymerization of actin decreases by two orders of magnitude. By studying concentrated actin samples (3 mg/mL) with and without added ions, we compare the behavior near and far above the CC for a sample with very similar concentrations of filamentous actin. To study the response to large forces we use holographic laser tweezers to pull microspheres through an actin network. We found that in samples far above the CC the microspheres strongly resist pulling, and have a well-defined relaxation time. Near the CC, the microspheres are easily pulled through the actin networks, and the relaxation is far more variable, which indicates that the actin filaments may be more dynamic and breakable.

[1]Work supported by NIH grant R21-EB-00328501.

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Date submitted: 30 Nov 2005 Electronic form version 1.4