

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Anisotropic dynamic response of stiff biopolymers OSKAR HAL-LATSCHEK, Department of Physics, Harvard , BENEDIKT OBERMAYER, Institut of Theoretical Physics, University of Leipzig, ERWIN FREY, Department of Physics und CeNS, Ludwig-Maximilians-University Munich, KLAUS KROY, Institute of Theoretical Physics, University of Leipzig — We have analyzed the dynamic response of stiff polymers under different force protocols, such as the sudden onset/release of a longitudinal or transverse point forces. In these non-equilibrium situations, an ordinary small gradient expansion fails to describe the Brownian motion of stiff polymers in the limit of short times due to the neglect of tension dynamics. We present an improved (multiple scale) perturbation theory unravelling the underlying nonlinear phenomenon that renders the short time dynamics quite complex. The polymers response exhibits asymptotic power law behaviour with distinct dynamic exponents that depend on the experimental scenario and the time regime.

Erwin Frey
Department of Physics und CeNS, Ludwig-Maximilians-University Munich

Date submitted: 30 Nov 2005

Electronic form version 1.4