Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Effects of Long Wave-length Thermal Fluctuations on the Elasticity of Nematic Elastomers[1] XIANGJUN XING, APARNA BASKARAN, Syracuse University — We study the long wavelength fluctuations of the nematic director as well as the phonon fields in nematic elastomers. These fluctuations have important effects on the elasticity in the large deformation regime. We calculate the nonlinear stress-strain relations for several simple geometry of deformation. We also analize the correlation functions of the nematic director and phonon fields in the presence of large uniform strain deformations. All of these results can be directly measured by experiments.

[1]supported by ACS PRF 44689-G7.

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Date submitted: 01 Dec 2006 Electronic form version 1.4