

Abstract Submitted  
for the MAR07 Meeting of  
The American Physical Society

**Determining Local Mechanical Properties of Soft Materials with Cavitation Rheology**<sup>1</sup> JESSICA A. ZIMBERLIN, ALFRED CROSBY, University of Massachusetts Amherst — To guide the development of tissue scaffolds and the characterization of naturally heterogeneous biological tissues, we have developed a method to determine the local modulus at an arbitrary point within a soft material. The method involves growing a cavity at the tip of a syringe needle and monitoring the pressure of the cavity at the onset of a mechanical instability. This critical pressure is directly related to the local modulus of the material. The results focus on the network development of poly(lactide)-poly(ethylene oxide)-poly(lactide) triblock copolymer and poly(vinyl alcohol) hydrogels. These materials serve as model materials for tissue scaffolds and soft biological tissues. This new method not only provides an easy, efficient, and economical method to guide the design and characterization of soft materials, but it also provides quantitative data of the local mechanical properties in naturally heterogeneous materials.

<sup>1</sup>NSF-MRSEC.

Jessica A. Zimmerlin  
University of Massachusetts Amherst

Date submitted: 29 Nov 2006

Electronic form version 1.4