

Abstract Submitted  
for the MAR07 Meeting of  
The American Physical Society

**Simultaneous shear and normal stiffness measurements of a nanoconfined liquid**<sup>1</sup> MIRCEA PANTEA, GEORGE MATEI, Wayne State University, SHIVA PATIL, University of Madrid, PETER HOFFMANN, Wayne State University — The nanomechanical behavior of nanoconfined liquids is of great interest in nanotribology, cellular biology and in the development of nanomechanical devices. In our lab, we have developed methods to measure the stiffness and damping in liquid films that are confined to the thickness of only a few molecular layers using a specially designed Atomic Force Microscope. By using two lock-in amplifiers together with a simple compensation circuit we are able to completely separate normal and shear stiffness and measure the two simultaneously as the tip is moved through the film, molecular layer by molecular layer. We will present our technique, the relevant theory and selected results on TEHOS, a model silicone oil.

<sup>1</sup>We are acknowledging support from NSF (Career), NSF-DBI and the Nano@Wayne initiative.

Peter Hoffmann  
Wayne State University

Date submitted: 20 Nov 2006

Electronic form version 1.4