

Abstract Submitted  
for the MAR05 Meeting of  
The American Physical Society

**Beyond Force Measurements: Molecular Diffusion in Confined Fluids** JEFF TURNER, Departments of Chemistry and of Materials Science, University of Illinois, ASHIS MUKHOPADHYAY, SUNG CHUL BAE, SANGMIN JEON, STEVE GRANICK — The thermal energy-driven rotation of an ultra-dilute concentration of a fluorescent probe was measured in a series of confined fluids. Crossed cylindrical walls of atomic smoothness were used to confine these samples. The systems of interest included a model lubricant, OMCTS, and a strongly associative and hydrogen bonding system, 1,2-propanediol. These molecules, when confined, showed very different probe rotation. In the highly associative system a slight increase in rotational diffusion coefficient is observed, while rotation slows slightly in the oily system (similar to our group's translational diffusion measurements). In both cases, the rotational mobility still shows the signature of a liquid system, in contrast to previous force studies suggesting "confinement-induced solidification."

Jeff Turner  
Departments of Chemistry and of Materials Science, University of Illinois

Date submitted: 29 Nov 2004

Electronic form version 1.4