

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Mechanical Properties of Nanometric Wire of Water. MANHEE LEE, BAEKMAN SUNG, WONHO JHE, Department of Physics and Astronomy, Seoul National University, Seoul 151-742, Korea, CNL TEAM — Water has been one of the perfect newtonian viscous liquids, which are exactly described by navier-stokes equation. Recently, it, however, was found that the effective shear viscosity of water confined between mica crystals at 10nm thickness is very different from the one of 3-dimensional bulk water. While some researchers have measured very high viscoelasticity of the confined liquid. the other researchers reported the fluidic nature of water confined between mica surfaces at <3.5 nm interfacial separation like bulk-water viscosity. These conflicting results concerning the mechanical properties of nanometric water have been continually reported for the past several years. None of them clearly clarified the mechanical properties of nanometric water, and the detailed behavior of the viscoelasticity within a tip-sample separation less than 1 nm has not been measured. Here, we present the mechanical properties of nanometric water with a spatial resolution less than 0.1nm such as viscoelasticity, dissipation energy, and phase transitions.

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Date submitted: 11 Dec 2007

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