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Mechanics of Nanometric Water Wire MANHEE LEE, BAEKMAN SUNG, BONGSU KIM, JONGWOO KIM, WONHO JHE, Seoul National University — Water has been one of the perfect newtonian viscous liquids, which are exactly described by navier-stokes equation. However, it has been found that the effective shear viscosity of water confined between mica crystals at few nanometer thickness is very different from the one of 3-dimensional bulk water. While some researchers have measured very high viscoelasticity of the confined liquid [1], the other researchers reported the fluidic nature of water confined between mica surfaces at <3.5 nm interfacial separation like bulk-water viscosity [2]. 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 investigate a nanometric water cluster formed between AFM tip and sample surface and present the nano-mechanical properties of it including viscoelasticity, dissipation energy, and phase transitions. [1] Y. Zhu and S. Granick, Phys. Rev. Lett. **87**, 096104 (2001). [2] U. Raviv, P. Laurat, and J. Klein, Nature (London) **413**, 51 (2001).

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