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Dynamic Shear Modulus of Nanometric Water Wire[1] MANHEE LEE, BONGSU KIM, WONHO JHE, Center for Nano-Liquids, Department of Physics and Astronomy, Seoul National University, CENTER FOR NANO-LIQUID TEAM — Water has been one of the perfect Newtonian viscous fluid, which is exactly described by navier-stokes equation. However, as its volume is decreased to the nanoscale, there arise various interesting phenomena. For example, the effective shear viscosity of 10nm thick water confined between mica crystals is very different from that of 3-dimensional bulk water. While some researchers have measured very high viscoelasticity of the confined liquid, other researchers have reported the bulk fluidic nature of water confined between mica surfaces at <3.5 nm interfacial separation. Although these 2-D thin films of water have been extensively studied for the past several years, it is still difficult to investigate novel features of a 1-D wire like configuration of water molecules at the nanoscale. Here, we present an experimental method for the formation and manipulation of the nanometric water wire and its mechanical properties including dynamic shear modulus, viscoelasticity, and dissipation energy.

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