

Abstract Submitted  
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**Measurements of the Tensile Strength of Nano-scale Water Columns**<sup>1</sup> COREY STAMBAUGH, MANHEE LEE, WONHO JHE, Seoul National University — When an AFM tip is approached to a flat surface a nano-scale water capillary spontaneously forms between tip and surface. Under such conditions water, which is normally a viscous material, has been shown to possess visco-elastic properties. In past experiments, the AFM was operated in the amplitude modulation mode. Changes in the oscillation amplitude were related to the gradient of the interaction force which resulted from the nano-scale water capillary. In this experiment, the movable top plate of a micro-mechanical force sensor is used as the flat surface providing a direct measurement of the water's interaction force. By adjusting the distance between the cantilever and the micro-mechanical force sensor the nano-scale water column is stretched. The response of the AFM and of the micro-mechanical force sensor provides a simultaneous measurement of the elasticity and force of the nano-scale water column. The measurements are made under a variety of environmental conditions and the results are compared to theory.

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Corey Stambaugh  
Seoul National University

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