

Abstract Submitted  
for the MAR08 Meeting of  
The American Physical Society

**Friction measurements on InAs NWs by AFM manipulation**

HAKAN PETTERSSON, Halmstad University, Halmstad, Sweden, GABRIELA CONACHE, Halmstad University, Halmstad, Sweden, STRUAN GRAY, Lund University, Lund, Sweden, MICHAEL BORDAG, Leipzig University, Leipzig, Germany, ALINE RIBAYROL, LINUS FROBERG, LARS SAMUELSON, LARS MONTELIUS, Lund University, Lund, Sweden — We discuss a new approach to measure the friction force between elastically deformed nanowires and a surface. The wires are bent, using an AFM, into an equilibrium shape determined by elastic restoring forces within the wire and friction between the wire and the surface. From measurements of the radius of curvature of the bent wires, elasticity theory allows the friction force per unit length to be calculated. We have studied friction properties of InAs nanowires deposited on SiO<sub>2</sub>, silanized SiO<sub>2</sub> and Si<sub>3</sub>N<sub>4</sub> substrates. The wires were typically from 0.5 to a few microns long, with diameters varying between 20 and 80 nm. Manipulation is done in a ‘Retrace Lift’ mode, where feedback is turned off for the reverse scan and the tip follows a nominal path. The effective manipulation force during the reverse scan can be changed by varying an offset in the height of the tip over the surface. We will report on interesting static- and sliding friction experiments with nanowires on the different substrates, including how the friction force per unit length varies with the diameter of the wires.

Hakan Pettersson  
Halmstad University, Halmstad

Date submitted: 28 Nov 2007

Electronic form version 1.4