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Mechanical testing of slanted and isolated copper nanorods using Atomic Force Microscope* C. GAIRE, D.-X. YE, T.-M. LU, G.-C. WANG, Dept. of Physics, Rensselaer Polytechnic Inst, Troy, NY 12180, C. R. PICU, Dept. of Mechanical, Aerospace and Nuclear Engg, Rensselaer Polytechnic Inst, Troy, NY, 12180 — Recently, the study of mechanical properties of sub-micron and nano-scale specimen has drawn a renewed attention. With the atomic force microscope (AFM) it is possible to probe the mechanics of these structures. Here we report one such test to find the force constant, Young's modulus and yield stress of a new type of nanostructures - polycrystalline Cu slanted nanorods of approximately rectangular cross section, fixed at one end to the substrate. These were grown by oblique angle physical vapor deposition. An AFM was used to image, locate the rod and apply force to get deflection at its free end as a function of applied force. Samples with different dimensions and rise angles were tested in bending using this technique. The method employed by our group for fabrication as well as the mechanical testing will be discussed and a comparison of the mechanical properties of the bulk and nano-scale specimen will be made based on our results. *Supported by NSF grant No. CMS-0324490.

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