Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Elastic properties of SiC nanoscopic wires MAXIM MAKEEV, NASA Ames Research Center, MS 229-1, Moffett Field, CA 94035, MADHU MENON, Department of Physics and Astronomy, University of Kentucky, Lexington, KY 40506, DEEPAK SRIVASTAVA, NASA Ames Research Center, MS 229-1, Moffett Field, CA 94035 — Mechanical properties of crystalline and amorphous SiC nanowires have been investigated using molecular dynamics simulations with the Tersoff bond-order interatomic potential. The crystalline and a-SiC nanowires of different diameters were studied under tension/compression, torsion, and bending. The bending and torsion rigidities are found to be strongly dependent on the wire size. This is unlike the Young's modulus computed from uniaxial loading curves. Atomistic relaxations effects near the thresholds of structural stability are investigated for the four employed load types. The mechanical properties of crystalline SiC nanowires are compared with a-SiC wires of the same radii.

Maxim Makeev
NASA Ames Research Center

Date submitted: 30 Nov 2005 Electronic form version 1.4