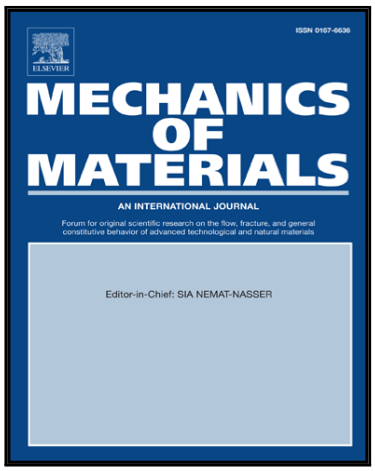

Surface Stress Effect on Silicon Nanowire Mechanical Behavior: Size and Orientation Dependence

Mohammad Nasr Esfahani, B. Erdem Alaca

PII: S0167-6636(18)30384-3
DOI: https://doi.org/10.1016/j.mechmat.2018.09.004
Reference: MECMAT 2925

To appear in: *Mechanics of Materials*

Received date: 5 June 2018
Revised date: 31 August 2018
Accepted date: 18 September 2018

Please cite this article as: Mohammad Nasr Esfahani, B. Erdem Alaca, Surface Stress Effect on Silicon Nanowire Mechanical Behavior: Size and Orientation Dependence, *Mechanics of Materials* (2018), doi: https://doi.org/10.1016/j.mechmat.2018.09.004

Highlights

- Using Surface Cauchy Born technique the atomic scale surface stress is linked to the mechanical behavior of diamond cubic crystals including silicon.
- The mechanical behavior of silicon nanowires is studied as a function of the crystal orientation and geometrical parameters.
- In cantilever configuration stress relaxation is observed to lead to a twist deformation for <100>and a bending deformation for <110>silicon nanowires.
- Implications of such stress related deformation are discussed from nanoelectromechanical systems (NEMS) perspective.