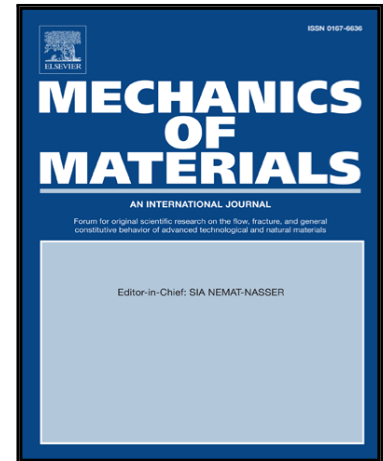


Accepted Manuscript

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

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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>

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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 $\langle 100 \rangle$ and a bending deformation for $\langle 110 \rangle$ silicon nanowires.
- Implications of such stress related deformation are discussed from nanoelectromechanical systems (NEMS) perspective.

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