replacing MAR16-2015-002532. Abst

for the MAR16 Meeting of
The American Physical Society

Spectroscopic and structural studies of energetically efficient transport in nanocontacts to NiSi nanowires[1] A. STEIN, BNL-CFN, Upton, NY, 11973, USA, I. A. H. FARHAT, Khalifa University, AMS Dept. and KSRC, 127788, Abu Dhabi, UAE, N. LACEVIC, Univ. of Melbourne, Australia, S. K. BAZUHAIR, S. S. AZHAR, KSRC, 127788, Abu Dhabi, UAE, A. F. ISAKOVIC, Khalifa University, AMS Dept. and KSRC, 127788, Abu Dhabi, UAE — Understanding correlations between mechanical, thermal, structural and electronic transport properties of different nanocontact geometries to nanowires, such as Au/Cu-NiSi-Si, remain one of the major goals of nanodevices reliability and scalability research. Aiming to clarify the failure modes and processes that affect the energy efficiency of transport and switching in constrained nanocontact geometries, such as end contacts, we conducted the structural, spectroscopic, and noise correlation studies. We show how the spatial (in)homogeneity at and in the near vicinity of the interface affects the transport performance of the nanojunctions. Mobile Ni clusters are identified at the nanojunction interface via Raman spectromicroscopy and their influence on charge transport is analyzed. We also show that the noise correlation spectra and micro-X-ray stress-strain studies in the nanojunctions are effictive tools in predicting the energy efficiency of the nanojunctions. A computational study of the interfacial properties of metal/Ni-Si via DFT and MD simulations is implemented.

[1]Work supported by Mubadala-SRC 2011-KJ-2190. A part of the work done at BNL-CFN, supported by DOE. A part of the work done at Cornell Univ.CFN and CCMR, supported by the NSF.

A. F. Isakovic
Khalifa University, AMS Dept. and KSRC, 127788, Abu Dhabi, UAE

Date submitted: 05 Nov 2015 Electronic form version 1.4