Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Magnetostriction in Ni Nanowires: Coherent X-ray Diffraction and Density Functional Analysis[1] ERANDI WIJERATHNA, Department of Physics, New Mexico State University, JONG WOO KIM, SAN WEN CHEN, Department of Physics, UC San Diego, ROSS HARDER, APS-Argonne National Lab, SOHINI MANNA, CMRR, UC San Diego, BORIS KIEFER, Department of Physics, New Mexico State University, ERIC FULLERTON, CMRR, UC San Diego, EDWIN FOHTUNG, Department of Physics, New Mexico State University, JOSE DE LA VENTA, Department of Physics, Colorado State University, OLEG SHPYRKO, Department of Physics, UC San Diego — Three-dimensional magnetostriction is mapped in Ni nanowires with the aid of Bragg coherent X-ray diffraction (BCXDI). By inverting the measured BCXDI patterns using iterative phase retrieval algorithms giant magnetostrictive strain are observed due to a differential anisotropy of the lattice displacements along the [111] and (001) directions. Density functional calculations performed is consistent with the experimental observation. Our finding paves the way for the fabrication and development of novel magnetostrictive sensor elements.

[1]This work is supported by US Department of Energy, Office of Science, Office of Basic Energy Sciences, under Contract DE-SC0001805

Edwin Fohtung
Department of Physics, New Mexico State University

Date submitted: 15 Nov 2013 Electronic form version 1.4