

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**Field dependence of  $T_B$  in NiO and (Ni, Zn)O Nanoclusters<sup>1</sup>**

YUNG HUH, Department of Physics, South Dakota State University, Brookings, SD 57007, M. PECK, R. SKOMSKI, R. ZHANG, P. KHAREL, M. ALLISON, D. SELLMYER, M. LANGELL — Size dependence of magnetic properties of rocksalt NiO and Zn substituted NiO nanoparticles are investigated. Nanoparticle diameters are determined from 8 to 30 nm by XRD and AFM. Uncompensated spins at the nanoparticle surface contribute to superparametism at low temperatures and their blocking temperatures increase with stronger applied field. The field induced spin canting of the antiferromagnetic sublattices is a bulk effect and studied by the substitution of Zn with transition metal. Nanoparticles start exhibiting bulk magnetic behavior with size greater than 18 nm. Magnetization rotation of uncompensated spins under the magnetic field is mainly due to nanoscale size effect. The anisotropy of the nanoparticle is about four times larger than that of the bulk NiO.

<sup>1</sup>This research is supported by the NSF (CHE-1012366 and Nebraska MRSEC Grant DMR-0820521), the DOE Grant DE-FG02-04ER46152 (P. K. and D. J. S.) and NCMN.

Yung Huh  
Dept of Physics, South Dakota State University, Brookings, SD 57007

Date submitted: 24 Jan 2011

Electronic form version 1.4