Abstract Submitted
for the NWS08 Meeting of
The American Physical Society

Giant positive magnetoresistance in Co-doped ZnO nanocluster films[1] YOU QIANG, YUFENG TIAN, Physics, University of Idaho, SHISHEN YAN, Physics, Shandong University, China, RYAN SOUZA, Physics, University of Idaho, PHYSICS, UNIVERSITY OF IDAHO COLLABORATION, PHYSICS, SHANDONG UNIVERSITY, CHINA COLLABORATION — We studied magnetoresistance of 0.5%, 12% and 30% Co-doped ZnO nanocluster films which are deposited on Si wafer. Microstructure analysis is performed by XPS, TEM and XRD, and shows a uniform mean size of 20 nm with perfect wurtzite ZnO structure. MR increases with Co doping concentration-0.5% with 469% while the other two samples have 744% and 811%. The large magnetoresistance is explained by suppression of spin-dependent hopping paths when localized states with onsite correlation undergo a relatively large Zeeman splitting in a magnetic field due to strong s,p-d interactions.

[1]DOER-EPSCoR and DOE-BES.

You Qiang
Physics, University of Idaho

Date submitted: 17 Apr 2008 Electronic form version 1.4