

Abstract Submitted  
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**Ferromagnetism in ZnO-CoO multilayers** SUDAKAR C., Wayne State University, Detroit, MI, B. KIRBY, NIST Center for Neutron Research, NIST, Gaithersburg, Maryland, SANJIV KUMAR, Bhabha Atomic Research Centre, Hyderabad, India, A. DIXIT, R. NAIK, G. LAWES, Department of Physics and Astronomy, Wayne State University, Detroit, V.M. NAIK, Department of Natural Sciences, University of Michigan-Dearborn — The magnetic properties of CoO-ZnO heterostructures are examined to elucidate the origin of the ferromagnetic signature in Co doped ZnO. We used RF magnetron sputter deposition to prepare superlattice films with alternating layers of CoO and ZnO on sapphire substrates. The CoO and ZnO layer thickness were varied from 20 nm to 100 nm and from 75 to 225 nm, respectively. Bulk magnetization measurements show that the multilayers exhibit a ferromagnetic moment at 300 K. Saturation magnetization decreases by two orders from  $5 \times 10^{-4}$  emu/cm<sup>2</sup> for CoO with no interface layer to  $1.6 \times 10^{-5}$  emu/cm<sup>2</sup> with ten layers of CoO/ZnO interfacial area. To study the chemical and magnetic interaction between ZnO and CoO, the CoO/ZnO interface has been probed with Rutherford backscattering and polarized neutron reflectometry. We will present thickness measure of any magnetized interface region, and the Co magnetic moment within those regions, which allow us to test specific models for the origin of ferromagnetism in this system.

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