Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Exchange biasing of (Ga,Cr)N thin films using a MnO layer HONGXUE LIU, Department of Chemical and Materials Engineering, Arizona State University, Tempe, Arizona 85287, STEPHEN WU, RAKESH SINGH, NATHAN NEWMAN — Recently, significant advances have been made in synthesizing various dilute magnetic semiconductors. To develop practical applications, and in particular MRAM type devices, it is important to formulate methods to manipulate the magnetic properties. In this study we report the observation of exchange biaing of ferromagnetic (FM) Cr-doped GaN films by an antiferromagnetic (AFM) MnO overlayer. The magnetic hysteresis loop shows a clear shift to negative magnetic field by $\sim$ 70 Oe when measured after field cooling, which is absent in single Cr GaN layers. Enhancement of the coercive field of the exchange biased Cr-dopedGaN, as compared to films without a MnO overlayer, is alsofound. The observation of the exchange bias in this system is attributed to the exchange coupling at the FM Cr-GaN/AFM MnO interface.

Hongxue Liu
Arizona State University

Date submitted: 07 Dec 2004 Electronic form version 1.4