Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Oxygen Annealing Studies of SnO_2:Co Thin Films Deposited by RF Sputtering[1] GRATIELA STOIAN, Florida State University, P.A. STAMPE, R.J. KENNEDY, Florida A&M University, Y. XIN, National High Magnetic Field Laboratory, Tallahassee, S. VON MOLNAR, Florida State University — We report on post-deposition oxygen annealing studies of SnO_2:Co thin films to examine the origin of the room temperature ferromagnetism (RTFM) observed in such materials. Materials are deposited on r-cut sapphire substrates by RF sputtering from a doped target with 5 at.% Co nominal concentration. Magnetization measurements reveal that as-grown samples in Ar atmosphere are non-magnetic at RT. However, by annealing them in low O_2 pressure (10^{-4}- 2x10^{-4} Torr), the saturation moment increases to $\sim$0.78 μ_B/Co at RT, somewhat lower than the expected value for Co^{2+} ions. This verifies that the Co ions are incorporated in the matrix. X-ray diffraction data show a decrease in crystallinity for the most magnetic samples annealed in O_2at 2x10^{-4} Torr. To confirm this, further structural and temperature-dependent magnetic measurements for various annealing protocols are underway to determine the nature of magnetism in SnO_2:Co sputtered thin films.

[1]Work supported by NSF DMR-0605734.

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Date submitted: 19 Nov 2011 Electronic form version 1.4