

Abstract Submitted  
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**VSM measurements on NiFe-oxide samples** D. C. BINOD, ANDRES OLIVA, ANIVAL AYALA, SHANKAR ACHARYA, FIDELE TWAGIRAYEZU, JAMES TALBERT, LUISA SCOLFARO, WILHELMUS GEERTS, Department of Physics, Texas State University, San Marcos, TX 78666 — Radio Frequency (RF) sputtered NiO thin films find application in various novel devices, including solar cells, batteries, computer memory, sensors, catalyzers, and gas sensors. The electric properties of NiO can be modified by changing the ratio of oxygen to metal atoms. In addition, it is possible to modify the materials crystallinity by doping it with other transition metals modifying grain size and defect density. Here, we discuss the magnetic properties of reactive RF sputtered NiO and Fe-doped NiO thin films sputtered at different O<sub>2</sub> flow rates ranging from 0.8 to 10 sccm. NiO films sputtered with high O<sub>2</sub> flows are highly conductive and transparent suggesting the presence of metal vacancies. Films deposited with an oxygen flow less than 1.25 sccm are not completely oxidized and have a large non-zero magnetization. The incomplete oxidation is confirmed by X-ray measurements which show the appearance of a metallic peak in the XRD data for lower O<sub>2</sub> flow samples. XPS measurements performed to verify the metal to oxidation ratio of the samples will be discussed as well. We acknowledge financial support from DOD (HBCU/MI grant W911NF-15-1-0394).

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