Abstract Submitted
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Synthesis of $Co_{1-x}Fe_{2+x}O_4$: Towards Spin Polarized Ferrites[1] JARRETT MOYER, HUI-QIONG WANG, Department of Applied Physics, CRISP, Yale University, CARLOS VAZ, CRISP, Yale University, ERIC ALTMAN, Department of Chemical Engineering, CRISP, Yale University, VICTOR HENRICH, Department of Applied Physics, CRISP, Yale University — Ferrites are promising materials for spintronic devices, since they are predicted to exhibit high spin polarizations [1]. Thin-film cobalt ferrite ($CoFe_2O_4$) has a large saturation magnetization and magnetic coercivity, but is insulating [2]. In this work, epitaxial $Co_{1-x}Fe_{2+x}O_4$ thin films are grown by MBE on Fe_3O_4(001) and MgO(001), where a fraction of the Co^{2+} ions are replaced with Fe^{2+}. LEED, RHEED and XRD confirm the crystal structure. Stoichiometry and cation valence states are ascertained by XPS, and the electronic structure near the Fermi level is determined by UPS. We show that, by varying the stoichiometry of $Co_{1-x}Fe_{2+x}O_4$, we can tailor its electronic properties, which may lead to a conductive, spin polarized ferrite. [1] J. Cibert, et al., C.R. Physique **6** (2005) 977. [2] W. Huang, et al., J. Crystal Growth **300** (2007) 426.

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