Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Magnetic properties of Fe substituted $SrRuO_3$ thin films and $SrRuO_3/Fe_2O_3$ superlattices OMAR CHMAISSEM, STANISLAW KOLESNIK, BOGDAN DABROWSKI, Physics Department, Northern Illinois University, DeKalb IL 60115, YONGSEONG CHOI, DANIEL HASKEL, Advanced Photon Source, Argonne National Laboratory, Argonne IL 60439, NIU COLLABORATION, ARGONNE COLLABORATION — In recent years, $SrRuO_3$ thin films have received considerable interest because of their potential for use as electrodes in oxide-based spintronic applications. $SrRuO_3$ bulk materials are known to exhibit good room temperature thermal and electrical conductivity, a stable perovskite crystal structure, and itinerant ferromagnetic properties at temperatures below 163 K. To the best of our knowledge, attempts to enhance the magnetic properties of $SrRuO_3$ through chemical substitutions of transition metal elements (e.g., Fe, Co, Mn, Cu, Zn, Ti, Cr, etc) at the Ru site, all failed except for the case of Cr substitutions in which T_C was successfully raised to 190 K. In this work, we will demonstrate the drastically different effects of Fe on the magnetic properties of $SrRuO_3$ bulk materials and thin films. We will also show and discuss the magnetic properties of $SrRuO_3/Fe_2O_3$ superlattices. Work supported by the NSF (DMR-0706610) and the DOE-Office of Science (DEAC-02-06CH11357).

Omar Chmaissem
Physics Department, Northern Illinois University, DeKalb IL 60115

Date submitted: 19 Nov 2009 Electronic form version 1.4