Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Magnetic Properties of PLD Grown Epitaxial Double Perovskite Thin Films\textsuperscript{1} D.E. BROWN, S. TOTAPALLY, Y. YOO, S. KOLESNIK, J. MAIS, O. CHMAISSEM, J. CHURILLA, B. DABROWSKI, C. KIMBALL, Physics Dept., Northern Illinois University, M. HAJI-SHEIK, Electrical Engineering Dept., Northern Illinois University — Transition metal oxides with a double perovskite structure $A_2\text{FeMoO}_6$ and ($A = \text{Ca, Ba, Sr}$) has attracted a great deal of attention owing to their high magnetic transition temperatures and spin dependent transport properties. Electronic structure calculations and experimental results show that these materials are half-metallic ferrimagnets with localized up-spin electrons on the Fe ions and itinerant down-spin electrons shared between Fe and Mo. The Fe and Mo atoms are ordered on alternating, corner-shared octahedral sites, however, the ordered array can have imperfections that are dependent upon synthesis conditions. We have grown, using a pulsed laser deposition device, epitaxial double perovskite thin films. These films have been characterized by SQUID, resistivity, and x-ray crystallography measurements. The measurements show that double perovskite thin films can be grown with a high degree of order between the Fe and Mo atoms. Thus these materials can be attractive candidates for spin electronic devices.

\textsuperscript{1}Work at NIU is supported by the Department of Education

Dennis Brown
Physics Dept. Northern Illinois University

Date submitted: 30 Nov 2005

Electronic form version 1.4