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Magnetic Properties of PLD Grown Expitaxial Double Perovskite Thin Films[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_2FeMoO_6 and (A = 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.

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