Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Transport phenomena in $SrVO_3$ thin films MAN GU, STUART WOLF, JIWEI LU, University of Virginia, UNIVERSITY OF VIRGINIA TEAM — Bulk $SrVO_3$ (SVO) with a $3d^1$ electronic configuration has been found to exhibit metallic and Pauli paramagnetic behavior. We have obtained epitaxial SVO films grown on various substrates (STO, SLAO, LSAT and LAO) using a pulsed electron-beam deposition (PED) technique. The film transport properties were found to be strongly dependent on the substrate. A 40 nm SVO film deposited on an STO substrate exhibited metallic behavior with the electrical resistivity following a T^2 law that corresponds to a Fermi liquid system, the resistance ratio R(300K)/R(2K) was $\sim$ 1.66. Hall measurements showed that the mobility increased slightly as the temperature was decreased. A small positive out-of-plane magnetoresistance was observed, it was only 0.045% at 5 K and 7 Tesla. SVO films with the same thickness grown on SLAO, LSAT and LAO showed semiconducting behavior, the different transport properties in the SVO films could be attributed to the compressive film strain or the different film-substrate interfaces.

Man Gu
University of Virginia

Date submitted: 14 Nov 2012 Electronic form version 1.4