Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Resistance-Strain Relation On Vanadium Dioxide Thin Films
ALI AMIRI, PATRICK LECLAIR, University of Alabama, Department of Physics, ARUN GUPTA, University of Alabama, MINT Center — Vanadium dioxide is a strongly correlated material with a sharp metal to insulator transition at ˜341 K. It is well known that the strain along c-axis can change the transition temperature, but the other effects of the strain have not been drawing much attention. In this work we have studied the effects of the strain on resistance changes in the polycrystalline and epitaxial films. Polycrystalline films of VO_2 are deposited on the Pb(Mg1/3Nb2/3)0.72Ti0.28O3(001) (PMN-PT) using a SiO_2 buffer layer. The strain on film is tuned by applying a bias electric field through the piezoelectric substrate, and the resistance is measured using four-probe method. The epitaxial films of VO_2 are grown on TiO_2 (001) and have been glued to PMN-PT substrate to transfer strain. The change in the resistance of the epitaxial films is measured to be only about 30% more than polycrystalline films for the same amount of strain. We have studied the strain-induced resistance changes as a function of temperature. we have shown that the resistance is more sensitive to strain in the metallic phase.

Ali amiri
University of Alabama, Department of Physics

Date submitted: 13 Jan 2016 Electronic form version 1.4