Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Two-dimensional electron gas in tricolor oxide interfaces YANWEI CAO, MICHAEL KAREEV, XIAORAN LIU, SRIMANTA MIDDEY, DEREK MEYERS, JAK TCHAKHALIAN, University of Arkansas — Understanding and manipulating spin of electrons in nanometer scale is the main challenge of current spintronics, recent emergent two-dimensional electron gas in oxide interface provides a good platform to investigate the spin behavior by covering an insulating magnetic oxide layer. In this work, take titanates as an example, ultra-thin tricolor (tri-compound) titanate superlattices ([LaTiO3/SrTiO3/YTiO3]) were grown in a layer-by-layer way by pulsed laser deposition. High sample quality and their electronic structures were characterized by the combination of in-situ photoelectron and ex-situ structure and surface morphology probes. Temperature-dependent sheet resistance indicates the presence of metallic interfaces in both [LaTiO3 /SrTiO3] and all the tricolor structures, whereas a [YTiO3 /SrTiO3] bi-layer shows insulating behavior. The tricolor titanate superlattices provide an opportunity to induce tunable spin-polarization into the two-dimensional electron gas (2DEG) with Mott carriers.

Yanwei Cao
University of Arkansas

Date submitted: 15 Nov 2013 Electronic form version 1.4