

MSE SEMINAR

September 8, 2017

113 McBryde Hall

3:30 – 4:30 PM

Refreshments at 3:00 PM

Min Gao

Graduate Student

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“Magnetolectricity of CoFe_2O_4 and tetragonal phase BiFeO_3 nanocomposites prepared by pulsed laser deposition”

Abstract

In order to investigate the coupling between the tetragonal phase of BiFeO_3 (BFO) and CoFe_2O_4 (CFO), bilayer structures of CFO (15 nm, 30 nm)/BFO (50 nm) were fabricated on (001) LaAlO_3 substrates by pulsed laser deposition. The surface morphologies and crystal structures were determined by atomic force microscopy and x-ray diffraction. Although the CFO and BFO layers were deposited separately, after annealing at 725°C for 30 min, the CFO on top developed a self-assembled platform-like morphology with BFO. Magnetic force microscopy images show that each platform contained multiple magnetic domains, which can be tuned by applying a tip bias. Hysteresis loops measured by a vibrating sample magnetometer suggest a strong thickness effect of the CFO on coercive field, in particular along the out-of-plane direction, where the coercivity was enhanced from 629 Oe to 2122 Oe as the thickness of CFO was increased from 15 nm to 30 nm.

Biosketch

Min Gao is a PhD candidate in Materials Science and Engineering, advised by Dr. Dwight Viehland. He received his Bachelor and Master degree in Materials Science and Engineering from University of Science and Technology Beijing in 2012 and 2015, respectively. His research interest involves the magnetoelectric oxide thin film materials.