

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Preparation and Characterization of SrCoO₃ Heterostructures Grown along the (111) Direction MINHUI HU, FANG YANG, JIANDONG GUO, Institute of Physics, Chinese Academy of Sciences, IOPSF6 TEAM — The Topological Insulators (TIs) have attracted much more attention in the research of condensed matter physics due to their promising application potentials [1, 2]. Recent theoretical work has discovered topological insulating behavior in heterostructures of transition-metal oxides (TMOs), and demonstrated that the perovskite-type TMOs films grown along the high-symmetry (111) direction were very likely to realize topological phases [3]. Even that, it is still a great challenge to grow well-suited TMOs films along the (111) direction to display the topological insulating property. In this work, we focus on preparing SrCoO₃ thin films on SrTiO₃ (111) substrates by UHV pulsed-laser deposition (PLD) equipped with in-situ monitoring by RHEED. After that we will discuss about the structural properties and characterization of SrCoO₃ (111) by XRD, XPS and transport measurements, etc. Based on the electron-phonon coupling phenomenon, we will explore the possible topologically non-trivial phase of SrCoO₃ (111). Our preliminary results may open new way to explore the topological effects from TMOs heterostructures. [1]Z. Fang et al. Science 329, 5987 (2010). [2]Q.-K. Xue et al. Science 340,167 (2013). [3]S. Okamoto et al. Nature communications 2, 596 (2011).

Minhui Hu
Institute of Physics, Chinese Academy of Sciences

Date submitted: 15 Nov 2013

Electronic form version 1.4