Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Spin-Orbit Interaction Effect in SrIrO3 Thin Films YANBIN CHEN, Physics Department and National Laboratory of Microstructure Physics, Nanjing University, SHAN-TAO ZHANG, YAN-FENG CHEN, Department of Materials Science and Engineering and National Laboratory of Microstructure Physics, Nanjing University — Spin-orbit interaction assistant Mott-insulator in Sr2IrO4 induces intensive study to explore the novel phases and corresponding physical properties that results from competition between electron-electron and spin-orbit interaction. In this work, we studied the physical property of SrIrO3 thin films, in which the spin-orbit interaction is larger than electron-electron interaction. In SrIrO3 films, we observed the metal-insulator transition when the thickness of SrIrO3 is thinner than 4 nm. The detailed analysis of temperature-dependent resistance and magnetoresistance substantiate that the metal-insulator transition is attributed to Anderson localization. Spin-orbit interaction plays the crucial role on the magnetoresistance at low magnetic field range (less than 2.5T). By analysis magnetoresistance, we observe that spin-orbit interaction coefficient is strongly dependent on temperature, which is explained by the strongly temperature-dependent g-factor. These studies may shield more light on the physical properties induced by synergetic contribution coming from electron-electron and spin-orbit interaction.

Yanbin Chen
Physics Department and National Laboratory of
Microstructure Physics, Nanjing University

Date submitted: 12 Dec 2013 Electronic form version 1.4