Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Anisotropic magnetoresistance in Sr_2IrO_4[1] C. WANG, H. SEINIGE, University of Texas at Austin, G. CAO, University of Kentucky, J.-S. ZHOU, J.B. GOODENOUGH, M. TSOI, University of Texas at Austin — We report the first measurements of the point-contact magnetoresistance (MR) of antiferromagnetic semiconductor Sr_2IrO_4. The point-contact technique allows to probe very small volumes associated with point contacts and, therefore, looks for electronic transport on a microscopic scale. Point-contact measurements with single crystals of Sr_2IrO_4 were intended to see if the additional local resistance associated with a small contact area between a sharpened Cu tip and the antiferromagnet shows MR such as that seen in bulk crystals. The Sr_2IrO_4 crystals were grown by the flux method. Point-contact measurements at liquid nitrogen temperature revealed large MRs (up to 8%) for modest magnetic fields (250 mT) applied within IrO_2 (ab) plane. The angular dependence of MR shows a crossover from four-fold to two-fold symmetry with an increasing magnetic field which may be tentatively attributed to the field-induced changes of antiferromagnetic order within IrO_2 planes. The observed MR can be potentially used to sense the antiferromagnetic order in spintronic applications.

[1]This work was supported in part by NSF grants DMR-1207577 and DMR-1122603

Maxim Tsoi
University of Texas at Austin

Date submitted: 14 Nov 2013 Electronic form version 1.4