

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Ionic liquid gating Sr_2IrO_4 single crystal¹ BOYI YANG, ALLEN GOLDMAN, Univ of Minnesota - Twin Cities — The 5d iridates have attracted much interest due to the prediction of novel electronic phases driven by the interplay of spin-orbit coupling with onsite Coulomb interaction. The compound Sr_2IrO_4 , with a crystal structure similar to that of La_2CuO_4 , was identified as a spin-orbital Mott insulator. It has been doped in various ways in search of a possible superconducting state considering its similarities to the cuprates. Unlike the common ionic liquid gated thin film field effect transistor (FET), here we have fabricated an ionic liquid (DEME-TFSI) gated FET based on the cleaved ab plane surface of a Sr_2IrO_4 single crystal. Due to the insulating behavior of the bulk, the sensitive surface gating effect can be characterized with transport property measurements. We find an insulator to metal transition around 75K upon hole doping, while a minimal gating effect is observed on electron accumulation at the cleaved single crystal surface. The low temperature metallic behavior will be further studied in detail and the latest experimental results will be reported.

¹This work was primarily supported by the National Science Foundation through the University of Minnesota MRSEC under Award No. DMR-1420013, and partially supported by the National Science Foundation under Award No. DMR-1209578.

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Date submitted: 06 Nov 2015

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