Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Insulator to Metal Transition in WO_3 Induced by Electrolyte Gating[1] XIANG LENG, JUAN PEREIRO, JURE STRLE, ANTHONY BOLLINGER, IVAN BOZOVIC, Brookhaven National Lab, NICK LITOMBE, Harvard University, GUY DUBUIS, DAVOR PAVUNA, EPFL — We have modified the transport properties of thin WO_3 films by the electric field effect using ionic liquids and solid electrolytes. Atomically flat films were prepared on different substrates by RF sputtering. The huge electric field that is generated in the double-layer induces an extraordinarily large change of the mobile charge carrier density in the sample. The sheet resistance of the gated film drops by more than 10 orders of magnitude at the lowest temperature, and a clear insulator-to-metal transition is observed. The thickness dependence has been studied and the mechanism of doping by electrolyte gating will be discussed.

[1]X.L. was supported by the Center for Emergent Superconductivity, an Energy Frontier Research Center funded by the US Department of Energy. I.B. and A.B. were supported by the U.S. Department of Energy.

Xiang Leng
Brookhaven National Lab

Date submitted: 15 Nov 2013 Electronic form version 1.4