

Abstract Submitted  
for the MAR15 Meeting of  
The American Physical Society

**Charge Density Wave Behavior of Ionic Liquid Gated Strontium Titanate Nanowires\*** TERENCE BRETZ-SULLIVAN, ALLEN GOLDMAN, University of Minnesota — Measurements of the current-voltage characteristics of ionic liquid gated nanometer scale channels of strontium titanate have been carried out. These characteristics exhibit a large voltage threshold for conduction and a nonlinear power law behavior at all temperatures measured. The source-drain current of these nanowires scales as a power law of the difference between the source-drain voltage and the threshold voltage. The temperature dependence of the threshold voltage appears to be related to the inverse of the temperature dependent dielectric constant of strontium titanate in qualitative agreement with a simple model of charge density wave depinning. These observations, when taken together, are evidence that a gate induced charge density wave has been induced, and is depinned by strong electric fields. \* This work was supported by DOE Basic Energy Sciences Grant DE-FG02-02ER46004. Samples were fabricated at the Minnesota Nanofabrication Center. Parts of this work were carried out in the University of Minnesota Characterization Facility, a member of the Materials Research Facilities Network ([www.mrfn.org](http://www.mrfn.org)) funded via the NSF MRSEC program.

Terence Bretz-Sullivan  
University of Minnesota

Date submitted: 12 Nov 2014

Electronic form version 1.4