

Abstract Submitted  
for the MAR16 Meeting of  
The American Physical Society

**Quantum Oscillations at LaTiO<sub>3</sub>/SrTiO<sub>3</sub> Interfaces<sup>1</sup>** MICHAEL VEIT, YURI SUZUKI, Stanford University — Emergent metallic behavior at the interface of the Mott insulator LaTiO<sub>3</sub> and the band insulator SrTiO<sub>3</sub> was observed for the first time more than a decade ago. Since then the metallicity has been explained in terms of charge redistribution at the interface combined with lattice relaxation. However to date, Shubnikov de Haas oscillations have not been reported in this two dimensional metallic system. For ultrathin (3-4 unit cells) LaTiO<sub>3</sub> thin films on SrTiO<sub>3</sub>, we report the observation of Shubnikov-de Haas oscillations whose frequency corresponds to a small Fermi pocket. Surprisingly the oscillation are only observed between 1 and 4 T. Above this range, the quantum limit is reached for this pocket so no more oscillations are observed. A Berry's phase of  $\pi$  is also detected in these oscillations. Additionally a strong in-plane anisotropic magnetoresistance was measured in the heterostructures which, along with the Berry's phase, is attributed to a giant Rashba coupling at the interface.

<sup>1</sup>This work is funded by a National Security Science Engineering Faculty Fellowship of the Department of Defense under N00014-15-1-0045

Michael Veit  
Stanford University

Date submitted: 05 Nov 2015

Electronic form version 1.4