Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Quasiparticle Interference Patterns on the Surface of a Topological Insulator with Superconductivity AARON FARRELL, McGill University, MAXIME BEAUDRY, University of Montreal, TAMI PEREG-BARNEA, McGill University, MARCEL FRANZ, University of British Columbia — When the electrons on the surface of a strong topological insulator are forced to undergo superconductive pairing (perhaps via proximity effect) a topological superconducting state is formed. Such a state is of interest as it plays host to Majorana modes on its boundaries and in vortex cores. For this reason it is currently of great interest to develop a theoretical understanding of any experimental probes of such systems. In this talk we will discuss the theory of one such probe. Namely, we present results for local density of states modulations in a Dirac system with superconductivity added. These results should be relevant to measurements in Scanning Tunnelling Spectroscopy (STS) on the surface of strong topological insulators with pairing either naturally arising or driven by proximity effect. By considering a variety of different impurity scatterers and tunings of the chemical potential in the system, we discuss different probes of the underlying Dirac physics present in these patterns.

Aaron Farrell
McGill Univ

Date submitted: 13 Nov 2014 Electronic form version 1.4