Contribution ID: **1102** Type: **Oral (Non-Student) / orale (non-étudiant)**

Gapless superconductivity on the surface of a 3D topological insulator

Wednesday 15 June 2016 09:15 (15 minutes)

Recent angle-resolved photoemission experiments have observed a proximity-induced superconducting gap in the helical surface states of the 3D topological insulator Bi_2Se_3, when a thin film of the latter is grown on a superconducting $NbSe_2$ substrate. The superconducting coherence peaks are strongly suppressed when the topological insulator thin film is doped with magnetic Mn impurities, which was interpreted as a destruction of superconductivity in the topological surface states. Motivated by these experiments, we explore a different possibility: gapless superconductivity, where a gapless electronic density of states coexists with a nonzero superconducting order parameter. We study a model of superconducting Dirac fermions coupled to random magnetic impurities within the Abrikosov-Gor'kov framework, and find finite regions of gapless superconductivity in the phase diagram of the system for both proximity-induced and intrinsic superconductivity.

Authors: HAN, Jinsen (University of Alberta); MACIEJKO, Joseph (University of Alberta); OZFIDAN, isil (University of Alberta)

Presenter: OZFIDAN, isil (University of Alberta)

Session Classification: W1-1 Superconductivity (DCMMP) / Supraconductivité (DPMCM)

Track Classification: Condensed Matter and Materials Physics / Physique de la matière condensée et matériaux (DCMMP-DPMCM)