

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Induced gap in topological materials from the superconducting proximity effect CHING-KAI CHIU, WILLIAM COLE, Condensed Matter Theory Center, University of Maryland — Topological superconductivity has been of considerable interest lately, with several proposed experimental realizations in solid state systems. A heterostructure of s-wave superconductor and 3D topological insulator is one of the more promising platforms, with topological superconductivity realized on the "naked" surface of the topological insulator through the superconducting proximity effect. We theoretically study the induced superconducting gap on the naked surface. Adjusting the Fermi level above the bulk gap (which is the case in experiments), our results for the induced superconducting gap are in agreement with that probed in thin topological insulators ($<10\text{nm}$) in the experiments (Nat. Phys. 10, 943-950 (2014) and Phys. Rev. Lett. 112, 217001 (2014)). We further predict the gap in thick topological insulators ($>10\text{nm}$). This work is supported by LPS-MPO-CMTC, Microsoft Q, and JQI-NSF-PFC.

Ching-Kai Chiu
Condensed Matter Theory Center, University of Maryland

Date submitted: 07 Nov 2015

Electronic form version 1.4