Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Effect of a spin-active interface on proximity-induced superconductivity in topological insulators[1] CHRISTOPHER TRIOLA, ENRICO ROSSI, Department of Physics, College of William and Mary, ALEXANDER BALATSKY, Los Alamos National Laboratory and Nordic Institute of Theoretical Physics (Nordita) — We examine the effect of a spin-active interface on the symmetry of proximity-induced superconducting pairing amplitudes in topological insulators. We employ diagramatic techniques to investigate the leading order contribution to the pairing amplitude considering 3 different kinds of spin-active interfaces: 1) those for which the interface leads to the wavefunctions of transmitted electrons picking up spin-dependent phases in addition to flipping the spin of transmitted electrons, 2) those with only spin-dependent phases and no spin-flipping, and 3) those with only spin-flipping and no spin-dependent phases. We find that in cases (1) and (2) a considerable odd-frequency spinful-triplet pairing is induced in the TI while for case (3) no spin triplet pairing is induced to leading order. We compare our results to those for a normal metal and ferromagnetic materials finding that the nontrivial spin structure of the TI leads to qualitatively different behavior.

[1]Work supported in part by ONR, grant number ONR-N00014-13-1-0321

Christopher Triola
Department of Physics, College of William and Mary

Date submitted: 13 Nov 2013 Electronic form version 1.4