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Order parameter and triplet correlations near a superconductor-topological insulator interface MAHMOUD LABABIDI, ERHAI ZHAO, George Mason University — At the interface between a 3D topological band insulator and an *s*- wave superconductor forms a remarkable 2D superconductor that can host Majorana fermions at vortex cores. Going beyond the original work of Fu and Kane [Phys. Rev. Lett. 100, 096407 (2008)], we present a microscopic theory for the proximity effect near the TI-S interface. We compute the superconducting order parameter as a function of the distance away from the interface by self-consistently solving the Bogoliubov-de Gennes equation. We discuss the suppression of the order parameter by the topological insulator. Moreover, we show that triplet superconducting correlations of $p_x \pm ip_y$ orbital symmetry are induced near the interface by the spin-orbit coupling inside the topological insulator.

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