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Proximity-induced unconventional superconductivity in topological insulators[1] ANNICA BLACK-SCHAFFER, Uppsala University, ALEXANDER BALATSKY, Nordita and Los Alamos National Laboratory — We study proximity-induced superconducting pairing in a three-dimensional topological insulator - superconductor hybrid structure for superconductors with different pairing symmetries. The Dirac surface state in the topological insulator gives rise to a coupling between spin-singlet and spin-triplet pairing amplitudes as well as pairing that is odd in frequency for p-wave superconductors. We also find that all superconductors induce pairing that is odd in both frequency and orbital (band) index, with a complete reciprocity between pairing in orbital index and frequency. We show that the different induced pairing amplitudes significantly modify the density of states in the TI surface layer.

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