

Abstract Submitted
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Effect of disorder on the decreasing the critical value of magnetic field in proximity induced topological superconductors¹ YAHYA ALAVIRAD, CHING-KAI CHIU, JAY SAU, Univ of Maryland-College Park — Here we investigate how adding disorder changes the critical value of magnetic field B_c required to observe the topological phase transition in proximity induced topological superconductors. We consider disordered topological superconductors in $D = 1, 2$ spatial dimensions and use numerical analysis to directly calculate the topological invariant. Qualitatively different behavior are found depending on the dimensionality of the system. In contrast to $D = 2$ for $D = 1$ we show that adding disorder gradually decreases B_c from the clean the case limit of $B_c = \sqrt{\mu^2 + \Delta^2}$ to $B_c = \Delta$. A discussion of why these results are expected is provided. These findings, specially in $D = 1$ dimension are of experimental interest since they show that the topological phase transition might be observable at values of magnetic field B_c much smaller than previously expected.

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