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Entanglement Entropy and Entanglement Spectrum of Disordered Topological Superconductors JAN BORCHMANN, AARON FARRELL, SHUNJI MATSUURA, TAMI PEREG-BARNEA, McGill Univ — In a spin orbit coupled superconductor model the system may change its topology as a function of model parameters. In a clean system, this has been shown to leave a distinct signature in the entanglement entropy [1]. In the current work, we analyze the entanglement spectrum and entropy of a disordered spin-orbit coupled superconductor with either s-wave or d-wave coupling. We study the effect of disorder on the entanglement entropy and spectrum through disorder averaging. By analyzing these quantities across the phase boundary we show that even in the presence of disorder, the entanglement properties exhibit signatures of the topology. We validate our findings by directly calculating the disorder averaged topological invariant in real space. [1] J. Borchmann, A. Farrell, Shunji Matsuura and T. Pereg-Barnea, arXiv:1407.5980

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