

Abstract Submitted  
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**Entanglement in a Cooper-pair Splitter based on a Topological Insulator** KOJI SATO, University of California, Los Angeles — We theoretically study a solid state device producing entangled electron pairs that are spatially separated by coupling a superconductor to the helical edge states of a two-dimensional topological insulator. The interacting regions of the edge states are taken to be finite length around the tunneling region to capture the effect of non-interacting leads, and the ends of a given edge are further connected to a beam splitter. By controlling the scattering through such beam splitters, we show that Bell test can be performed via measurement of the current-current correlations.

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