

Abstract Submitted  
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**Possibility of disorder-induced sub-gap states near Majorana modes in topological insulator edges**<sup>1</sup> HOI-YIN HUI, JAY SAU, Condensed Matter Theory Center and Joint Quantum Institute, University of Maryland, College Park — We study the effects of multiple channel and disorder in the topological insulator(TI)-superconductor(SC)-ferromagnetic insulator(FI) hybrid structure, which has been proposed to realize Majorana modes. According to Anderson's theorem, proximity-induced SC in a TI is robust to all non-magnetic impurities. This however cannot be applied to the SC/FI interface where the end Majorana is located, since the time-reversal symmetry is locally broken. In this paper we study the spectrum near a SC/FI interface on a disordered TI edge. While we find that only the Majorana mode is induced single-channel case, inter-channel scatterings in a multichannel TI can induce extra localized states. We shall comment on its effects in the detection and manipulations of the Majorana.

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Hoi-Yin Hui  
Condensed Matter Theory Center and Joint Quantum Institute,  
University of Maryland, College Park

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