

Abstract Submitted
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Majorana edge modes of topological exciton condensate with superconductors¹ BABAK SERADJEH, Indiana University, Bloomington — I study the edge states of the topological exciton condensate formed by a Coulomb interaction between two parallel surfaces of a strong topological insulator. When the condensate is contacted by superconductors with a π phase shift across the two surfaces, a pair of counterpropagating Majorana modes close the gap at the boundary. I propose a nanostructured system of topological insulators and superconductors that hosts unpaired Majorana fermions when and only when the exciton condensate forms. Therefore, measuring the Majorana signal in this structure provides a way of detecting the topological exciton condensate that is uniquely related to its topological nature. The relevant experimental signatures as well as implications for related systems are discussed.

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Babak Seradjeh
Indiana University, Bloomington

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