

Abstract Submitted
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Majorana fermions in superconducting helical magnets IVAR MARTIN, LANL, ALBERTO MORPURGO, University of Geneva — In a variety of rare-earth based compounds singlet superconductivity coexists with helical magnetism. Here we demonstrate that surfaces of these system are expected to generically host a finite density of zero-energy Majorana modes. When confined to a wire geometry, a discrete number of Majorana modes can be isolated, in close analogy with the Rashba superconductors proposed recently as a framework for topological quantum computing. In contrast to the latter systems, however, the larger characteristic energy scales for superconductivity and magnetism, as well as the lack of need for fine-tuning, make helical magnetic superconducting compounds favorable for the observation and experimental investigation of Majorana fermions.

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