Abstract Submitted
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Hints of hybridizing Majorana fermions in a nanowire coupled to superconducting leads[1] A.D.K. FINCK, D.J. VAN HARLINGEN, P.K. MOHSENI, K. JUNG, X. LI, University of Illinois at Urbana-Champaign — It has been proposed that a nanowire with strong spin-orbit coupling that is contacted with a conventional superconductor and subjected to a large magnetic field can be driven through a topological phase transition. In this regime, the two ends of the nanowire together host a pair of quasi-particles known as Majorana fermions (MFs). A key feature of MFs is that they are pinned to zero energy when the topological nanowire is long enough such that the wave functions of the two MFs do not overlap significantly, resulting in a zero bias anomaly (ZBA). It has been recently predicted that changes in external parameters can vary the wave function overlap and cause the MFs to hybridize in an oscillatory fashion. This would lead to a non-monotonic splitting or broadening of the ZBA and help distinguish MF transport signatures from a Kondo effect. Here, we present transport studies of an InAs nanowire contacted with niobium nitride leads in high magnetic fields. We observe a number of robust ZBAs that can persist for a wide range of back gate bias and magnetic field strength. Under certain conditions, we find that the height and width of the ZBA can oscillate with back gate bias or magnetic field.

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