Abstract Submitted
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Experimental search for Majorana fermions in chains of magnetic atoms on a superconductor[1] STEVAN NADJ-PERGE, ILYA DROZDOV, SANGJUN JEON, JUNGPIL SEO, ANDREI BERNEVIG, ALI YAZDANI, Princeton University — The ongoing search for Majorana fermions (MF) is currently hindered by various disorder effects which can mimic signatures of MF modes. To overcome this problem, cleaner systems are needed in which MF modes can be readily distinguished from disorder induced effects. In this talk I will present novel experimental approach to realize MF modes in chains of magnetic atoms on the surface of an s-wave superconductor. Our experimental efforts are motivated by model calculations which show that such chains can support topological superconductivity with MF end modes [1]. Surprisingly, even short chains consisting of tens of atoms can host well resolved Majorana modes under suitable conditions depending on the relative spin orientations of adjacent atoms. We realize magnetic chains using self-assembled growth technique and probe their electronic structure using scanning tunneling microscopy. Results from spatially resolved spectroscopic mapping reveal zero energy modes at the chain ends, consistent with the existence of MF modes in this system. [1] S. Nadj-Perge, I. K. Drozdov, B. A. Bernevig., Ali Yazdani, Phys. Rev. B 88, 020407(R) (2013).

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