

Signatures of Majorana Fermions in Magnetic Atom Chains on a Superconductor

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Majorana fermion is an unconventional particle that is its own anti-particle. The emergence of this peculiar particle is predicted at the edge of a topological superconductor, which can be realized when a ferromagnetic material is placed in proximity to a conventional superconductor. In the experiment, we have built a ferromagnetic iron (Fe) atomic chain on the surface of a conventional superconductor (Pb). Using scanning tunneling spectroscopic techniques, we show the onset of p-wave superconductivity, and appearance of zero-energy states at the edge of the chain. This spatially resolved signature provides strong evidence for the formation of a topological phase and edge-bound Majorana fermions in the atomic chain.