

Abstract Submitted
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Experimental Observation of Topological Superconductivity and Majorana Zero Modes on β -Bi₂Pd Thin Films.¹ YANFENG LYU, Department of Physics, Tsinghua University, Beijing 100084, China — By using a cryogenic scanning tunneling microscope, we reveal a nodeless superconducting gap on epitaxial crystalline β -Bi₂Pd films, which is much larger than that of bulk superconducting β -Bi₂Pd. The newly emerging superconducting gap is found to originate from Dirac-fermion enhanced parity mixing of the surface pairing potential, thereby indicates topological superconductivity with spinless odd-parity pairing near the film surface. Majorana zero modes, supported by such a superconducting state, are unequivocally identified by directly probing quasiparticle density of states within the vortex cores under magnetic field. The superconductivity and Majorana zero modes are immune to intrinsic point and linear defects, characteristic of a time-reversal-invariant topological superconductor.

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