

Abstract Submitted
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Josephson effect and Meissner response of monopole superconductivity in Weyl semimetals¹ SHU-PING LEE, YI LI, Johns Hopkins Univ — In this talk, we would like to propose experimental signatures of monopole superconductivity in time-reversal symmetry broken Weyl semimetals, where nontrivial Berry phases of Cooper pairs lead to novel nodal superconducting symmetry protected by topology. By calculating the energy-phase relation of a Josephson junction between superconducting Weyl semimetals, we show the zero-energy Majorana modes emerging at the junction interface that leads to a single electron tunneling with 4π fractional Josephson effect. The topologically protected Majorana boundary modes with divergent density of state can lead to paramagnetic Meissner response in the presence of a magnetic field that is in a sharp contrast to a typical s-wave superconductor with conventional diamagnetic Meissner effect.

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