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Topological superconductivity with unconventional pairing symmetry characterized by monopole harmonics YI LI, Princeton University —
We study the topological structure of Cooper pairing whose symmetry is characterized by the monopole harmonic functions instead of the usual spherical harmonic functions. This pairing symmetry can be either driven by the non-trivial topology of the Fermi surface or by interaction effects. The Bogoliubov quasi-particles are nodal which can either exhibit time-reversal invariant Dirac type spectrum or the time-reversal symmetry breaking Weyl spectra with the winding numbers determined the monopole harmonic functions. The non-trivial electromagnetic responses are also discussed. These exotic pairing symmetry can be realized in 3D Weyl metal and fermion systems with magnetic dipolar interactions.

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