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Superconductivity in Weyl metals GRIGORY BEDNIK, ANTON BURKOV, University of Waterloo, ALEXANDER ZYUZIN, University of Basel — We report on a study of intrinsic superconductivity in a Weyl metal. We show that two distinct superconducting states are possible in this system in principle: a zero-momentum pairing BCS state, with point nodes in the gap function; and a finite-momentum FFLO-like state, with a full nodeless gap. We find that, in an inversion-symmetric Weyl metal the odd-parity BCS state has a lower energy than the FFLO state, despite the nodes in the gap. The FFLO state, on the other hand, may have a lower energy in a noncentrosymmetric Weyl metal, in which Weyl nodes of opposite chirality have different energy. We also discuss the anomalous Hall effect in a superconducting Weyl metal and show that it is not affected by the presence of superconductivity at low enough energies, i.e. when the Fermi surfaces is close enough to the nodes.

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