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Robust Resistive Critical Field in Noncentrosymmetric B20 AuBe DJ REBAR, JF DITUSA, P ADAMS, J BALL, D BROWNE, I VEKHTER, D YOUNG, J PRESTIGIACOMO, Louisiana State University, JY CHAN, The University of Texas at Dallas — AuBe is a chiral-structured (B20 structure) superconductor. The B20 structure in magnetic systems was discovered to host a magnetic topological structure, the Skyrmion lattice, and our research focused on what behavior the same structure would effect in a superconducting system. Samples were arc-melted in an Ar atmosphere and characterized via powder XRD. Specific heat measurement revealed bulk superconductivity with an exponential form below Tc while magnetization showed Type I behavior near the Tc of 3.2 K and a crossover to Type II behavior at approximately 1.2 K. Resistance measurement revealed a critical field that deviates from that found in magnetization measurements at approximately 2.4 K linearly rising with decreasing T to approximately 3.5x Hc2 at T=0.3K. The resistive critical field was also found to be robust against a Cr film deposited on the surface of AuBe. We find similarity between this superconductivity crossover behavior and robust low temperature critical field with other noncentrosymmetric superconductors in literature. Additionally, we measured the de Haas-van Alphen effect in polycrystalline samples and derived an effective electron mass of 0.16mo for a small spherical piece of Fermi surface.

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