

Abstract Submitted
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Superconducting Properties of the Non-Fermi-Liquid System β -YbAlB₄. KENTARO KUGA, YOSHITOMO KARAKI, YOSUKE MATSUMOTO, YO MACHIDA, NAOKI HORIE, SATORU NAKATSUJI, Institute for Solid State Physics — β -YbAlB₄ is the first Yb-based heavy fermion superconductor with the transition temperature of $T_{\text{c}} = 80$ mK [1]. Our study using high-purity single crystals indicates that the clean limit superconductivity directly emerges from the pronounced non-Fermi-liquid state [2]. The critical fields are anisotropic and probably have a paramagnetic effect under field along the c -axis because of the divergent behavior of the Ising like c -axis susceptibility. The strong pair-breaking effect, most likely due to nonmagnetic impurities, suggests that β -YbAlB₄ is an unconventional superconductor. We discuss the detailed properties of superconductivity and quantum criticality. [1] S. Nakatsuji, K. Kuga, Y. Machida, T. Tayama, T. Sakakibara, Y. Karaki, H. Ishimoto, S. Yonezawa, Y. Maeno, E. Pearson, G. G. Lonzarich, L. Balicas, H. Lee and Z. Fisk, *Nature Physics*, **4**, 603 (2008). [2] K. Kuga, Y. Karaki, Y. Matsumoto, Y. Machida, and S. Nakatsuji, *Physical Review Letters*, **101**, 137004 (2008).

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