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Upper critical fields of $NdFeAsO_{0.7}F_{0.3}$ single crystal[1] J. JAROSZYNSKI, F. HUNTE, L. BALICAS, YOUN-JUNG JO, IVANA RAICEVIC, A. GUREVICH, D.C. LARBALESTIER, F.F. BALAKIREV, NHMFL, L. FANG, P. CHENG, Y. JIA, H.H. WEN, NLS CAS — We present measurements of the resistivity and the upper critical field H_{c2} of NdFeAs $O_{0.7}F_{0.3}$ single crystals in strong DC and pulsed magnetic fields up to 45 T and 60 T, respectively. We found that the field scale of H_{c2} is comparable to ~ 100 T of high T_c cuprates. $H_{c2}(T)$ parallel to the c-axis exhibits a pronounced upward curvature similar to what was extracted from earlier measurements on polycrystalline samples. Thus this behavior is indeed an intrinsic feature of oxypnictides, rather than manifestation of vortex lattice melting or granularity. The orientational dependence of H_{c2} shows deviations from the one-band Ginzburg-Landau scaling. The mass anisotropy decreases as T decreases, from 9.2 at 44 K to 5 at 34 K. We discuss to what extent different pairing scenarios can manifest themselves in the observed behavior of H_{c2}, using the two-band model of superconductivity. The results indicate the importance of paramagnetic effects on $H_{c2}(T)$, which may significantly reduce $H_{c2}(0)$ as compared to $H_{c2}(0) \sim 200 - 300$ T based on extrapolations of $H_{c2}(T)$ near T_c down to low temperatures.

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