

Abstract Submitted
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Angle - dependent upper critical field of overdoped $\text{Ba}(\text{Fe}_{1-x}\text{Ni}_x)_2\text{As}_2$ JASON MURPHY, M.A. TANATAR, N. NI, S.L. BUD'KO, P.C. CANFIELD, R. PROZOROV, The Ames Laboratory, D. GRAF, National High Magnetic Field Laboratory — In-plane resistivity measurements were used to study the upper critical field, H_{c2} , of single crystals of iron-based superconductor $\text{Ba}(\text{Fe}_{1-x}\text{Ni}_x)_2\text{As}_2$ ($x = 0.054$ and $x = 0.072$). An applied magnetic field (up to 35 T) was precisely aligned (with the accuracy better than 0.1°) parallel to the Fe-As layers and the measurements were taken for $H \parallel ab$ - plane and $H \parallel c$ -axis as function of temperature. The determined $H_{c2}(T)$ clearly differs for the two principal directions. The dependence of the upper critical field on the angle Θ between the field direction and the ab -plane was measured in isothermal conditions at temperatures close to T_{c0} and at low temperatures $T \ll T_c(H = 0)$. In both temperature regimes $H_{c2}(\Theta)$ clearly deviates from sinusoidal function, expected for orbital H_{c2} [1]. We discuss the origin of this behavior as possible reflection of the angular modulation of the superconducting gap magnitude and the complex warping of the Fermi surface along the c -axis. Work in Ames was supported by the Department of Energy Office of Science, Basic Energy Sciences under Contract No. DE-AC02-O7CH11358.

[1] V. G. Kogan and R. Prozorov, Rep. Prog. Phys. **75**, 114502 (2012).

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