

Abstract Submitted
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Co-concentration dependence of the London penetration depth in single crystals of $\text{Ba}(\text{Fe}_{1-x}\text{Co}_x)_2\text{As}_2$ R.T. GORDON, C. MARTIN, H. KIM, M.A. TANATAR, N. NI, S.L. BUD'KO, P.C. CANFIELD, J. SCHMALIAN, R. PROZOROV, Ames Laboratory and Department of Physics and Astronomy, Iowa State University — The in-plane London penetration depth, $\lambda_{ab}(T)$, has been measured in single crystals of $\text{Ba}(\text{Fe}_{1-x}\text{Co}_x)_2\text{As}_2$ for several values of x using a tunnel diode resonator (TDR) technique. The low temperature behavior of the variation of the penetration depth follows a clear power law behavior, $\Delta\lambda(T) \propto T^n$, for all measured Co concentrations with n varying between 2 on the underdoped side to about 2.5 at the optimal doping. This non-exponential behavior in $\Delta\lambda$ indicates the existence of a significant number of superconducting quasiparticles, which is characteristic of a superconducting gap function possessing some type of nodal structure. The overall change in the superfluid density as a function of doping will be discussed. R. T. Gordon *et al.* arXiv:0810.2295 (2008).

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