

Abstract Submitted
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The Determination of $\lambda_{ab}(0)$ in $\text{Ba}(\text{Fe}_{1-x}\text{Co}_x)_2\text{As}_2$ from Tunnel Diode Resonator Measurements RYAN GORDON, HYUNSOO KIM, Iowa State University and Ames Laboratory, CATALIN MARTIN, University of Florida, NICHOLAI SALOVICH, University of Illinois, NI NI, Iowa State University and Ames Laboratory, MAKARIY TANATAR, Ames Laboratory, RUSSELL GIANNETTA, University of Illinois, PAUL CANFIELD, RUSLAN PROZOROV, Iowa State University and Ames Laboratory — The tunnel diode resonator (TDR) technique allows for precision measurements of the change of the London penetration depth with temperature, $\Delta\lambda(T)$, in superconductors, but before now this approach has been insensitive to the zero temperature value, $\lambda(0)$, which is necessary for absolute calibration. A method for the determination of $\lambda(0)$ in superconductors has been developed that utilizes the capabilities of the TDR system along with a technique in which samples are coated with a thin film of aluminum [1]. Using this procedure, $\lambda_{ab}(0)$ has been measured for the $\text{Ba}(\text{Fe}_{1-x}\text{Co}_x)_2\text{As}_2$ series for superconducting samples ranging from underdoped to overdoped concentrations. The resulting temperature dependence of the superfluid density, $\rho_s = [\lambda(0)/\lambda(T)]^2$, constructed from penetration depth measurements also obtained using a TDR system, will be discussed in terms of current theoretical models. [1] R. Prozorov *et al.*, Appl. Phys. Lett. **77**, 25 (2000).

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