

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Superfluid

density in heavy fermion superconductor $\text{Ce}_{1-x}\text{Yb}_x\text{CoIn}_5$ ¹ LEI SHU, Fudan University, China, D.E. MACLAUGHLIN, University of California, Riverside, USA, O.O. BERNAL, California State University, Los Angeles, USA, X.P. SHEN, Fudan University, China, S. PHAM, California State University, Los Angeles, USA, I. LUM, M.B. MAPLE, University of California, San Diego, USA — Recent x-ray diffraction, electrical resistivity, magnetic susceptibility, and specific heat measurements on the superconducting heavy fermion system $\text{Ce}_{1-x}\text{Yb}_x\text{CoIn}_5$ reveal that the correlated electron state is stabilized throughout the range $0 < x < 0.8$, apparently due to cooperative behavior of Ce and Yb ions involving their unstable valences. Phase separation occurs for $x > 0.8$. Interestingly, the superconducting critical temperature decreases linearly with x from 2.3 K at $x = 0$ towards 0 K at $x = 1$. Transverse-field muon spin rotation experiments have been performed on $\text{Ce}_{1-x}\text{Yb}_x\text{CoIn}_5$ alloys. Based on these measurements, we report the absolute value of magnetic penetration depth as a function of x and discuss whether T_c is controlled by the superfluid density of superconducting carriers. The results are compared to a recently proposed theory for the superconductivity in $\text{Ce}_{1-x}\text{Yb}_x\text{CoIn}_5$

¹This work was supported by Chinese NSF, grant 11204041, NSF of Shanghai, grant 12ZR1401200, the U.S. NSF, grants DMR-0801407 (Riverside), DMR-1105380 (Los Angeles), and the U.S. DOE, contract DE-FG-02-04ER46105 (San Diego).

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Date submitted: 28 Dec 2012

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