

Abstract Submitted
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Evolution of the phase diagrams in the pseudoternary system

Pr_{1-x}Nd_xOs₄Sb₁₂¹ P.-C. HO, Physics/California State University, Fresno, R.B. BAUMBACH, L. SHU, M.B. MAPLE, Physics/University of California, San Diego, S. ZHAO, D.E. MACLAUGHLIN, Physics/University of California, Riverside, T. YANAGISAWA, Hokkaido University, Japan — The pseudo ternary system Pr_{1-x}Nd_xOs₄Sb₁₂ has been used as a model system to investigate the effect of ferromagnetism (FM) on the unconventional superconductivity (SC), the high field ordered phase (HFOP), and quantum critical behavior [1], that was observed in PrOs₄Sb₁₂. SC in this system disappears near the Nd concentration $x \sim 0.58$. Between $x \sim 0.33$ and ~ 0.58 , weak FM, confirmed by the μ SR experiments [2], was found to coexist with SC. In order to further inspect the possible quantum critical behavior, a power-law analysis of the temperature dependence of the electrical resistivity data was performed. Upon suppression of SC, for samples in the range $0.33 < x < 0.58$, the power-law exponent decreases from ~ 1.8 toward 1 in the temperature region below 2.5 K, resembling non-Fermi liquid behavior. Detailed T-x, H-x, and H-T phase diagrams for various x will be discussed.

[1] Ho, et. al., PRB 83, 024511 (2011).

[2] Ho, et. al., 2010 APS March Meeting, A38.00005 (2010).

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