

Abstract Submitted
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Effect of Nd Substitution on $\text{PrOs}_4\text{Sb}_{12}$ Investigated by μSR Experiments¹ P.-C. HO, B. SOMSANUK, Physics/CSU-Fresno, D. E. MACLAUGHLIN, Physics/UC Riverside, M. B. MAPLE, UC San Diego, L. SHU, Physics/Fudan U, China, O. O. BERNAL, Physics/CSU-Los Angeles, T. YANAGISAWA, Physics/Hokkaido U, Japan — The pseudo ternary system $\text{Pr}_{1-x}\text{Nd}_x\text{Os}_4\text{Sb}_{12}$ has been used as a model system to investigate the effect of ferromagnetism (FM) on the unconventional superconductivity (SC) and quantum critical behavior of $\text{PrOs}_4\text{Sb}_{12}$ [1]. SC in this system disappears near a critical concentration $x_{cr,1} \sim 0.58$ and FM appears above $x_{cr,2} \sim 0.33$ [1,2]. The new μSR measurements have been performed on samples with $x = 0.25, 0.75,$ and 1 . For $x = 1$ and 0.75 , the estimated frozen moments agree with the Nd^{3+} CEF ground state moment. For $x = 0.25$, neither time reversal symmetry breaking nor evidence of freezing of Nd^{3+} spins was observed in zero-field μSR measurements, the behavior of which is very different than what is observed for $x = 0.45 - 0.55$ [2]. In the SC state, an unexpected linear T dependence of the Gaussian relaxation rate was also found in the transverse field μSR data for $x = 0.25$, which is different than the plateau in $\text{PrOs}_4\text{Sb}_{12}$ below 1.3K [3]. [1] Ho, et al., PRB 83, 024511 (2011).[2] Ho, et al., 2010 APS March Meeting, A38.00005 (2010). [3] MacLaughlin et al., PRL 105, 019701 (2010).

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