

Abstract Submitted  
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**The effect of Nd substitution on superconductivity of  $\text{PrOs}_4\text{Sb}_{12}$**

P.-C. HO, N.P. BUTCH, T. YANAGISAWA, W.M. YUHASZ, N.A. FREDERICK, T.A. SAYLES, D.P. AROVAS, M.B. MAPLE, Physics and IPAPS/UCSD, J.B. BETTS, A.H. LACERDA, NHMFL/LANL — The filled skutterudite compound  $\text{PrOs}_4\text{Sb}_{12}$  is an unconventional heavy fermion superconductor with  $T_c=1.85\text{K}$ . Our recent study shows that  $\text{NdOs}_4\text{Sb}_{12}$  is a heavy fermion ferromagnet ( $T_{FM} \sim 1\text{K}$ ) with possible spin wave excitations. Previous experimental evidence suggests that the superconducting pairing in  $\text{PrOs}_4\text{Sb}_{12}$  is spin-triplet, which, when considered along with the low  $T_{FM}$  of  $\text{NdOs}_4\text{Sb}_{12}$  implies that  $\text{PrOs}_4\text{Sb}_{12}$  may be near a ferromagnetic quantum critical point. We have measured zero-field ac magnetic susceptibility and electrical resistivity between 0T and 8T for the  $(\text{Pr}_{1-x}\text{Nd}_x)\text{Os}_4\text{Sb}_{12}$  system with  $x=0.1, 0.2, 0.4, 0.6, 0.8$ . The superconductivity persists to  $x=0.4$  and the ferromagnetism appears above  $x=0.6$ . In the normal state of samples with  $x=0.1, 0.2, 0.4$ , the features related to the antiferroquadrupolar phase are clearly observed, in contrast to the disappearance of the features above  $x=0.05$  in the  $\text{Pr}(\text{Os}_{1-x}\text{Ru}_x)_4\text{Sb}_{12}$  system. The phase diagrams of  $T_c$  and  $T_{FM}$ -Nd concentration  $x$  and  $H$ - $T$  will be presented. Funded by U.S. DOE and NSF; NHMFL by NSF, FL, and DOE.

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