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Evolution of Power-Law Behavior of Temperature Dependence of Electrical Resistivity in $\mathbf{Pr_{1-x}Nd_xOs_4Sb_{12}}$[1] P.-C. HO, Physics/California State University, Fresno, R.E. BAUMBACH, A.A. DOORAGHI, M.B. MAPLE, Physics/University of California, San Diego, T. YANAGISAWA, Hokkaido University, Japan — The study of the $Pr_{1-x}Nd_xOs_4Sb_{12}$ series has been carried out in order to investigate the effect of ferromagnetism (FM) on the unconventional superconductivity (SC), the high field ordered phase (HFOP), and quantum critical behavior in $PrOs_4Sb_{12}$ [1, 2, 3]. Two critical concentrations $x_{cr,1} \sim 0.58$ and $x_{cr,2} \sim 0.33$ were previously identified in this system [2]: SC disappears near $x_{cr,1}$ and weak FM extends into the SC region for $x_{cr,2} < x < x_{cr,1}$ [3]. In order to further examine the possible quantum critical behavior, a power-law analysis of the temperature dependence of the electrical resistivity data is performed. Upon suppression of SC, for samples of $x_{cr,2} < x < x_{cr,1}$, the power-law exponent decreases from ~ 1.8 toward 1 in the temperature region below 2.5 K, resembling non-Fermi liquid behavior.

[1] Ho, et. al., Physica B 403, 1038 (2008).
[2] Ho, et. al., arXiv:1008.5198v1 (2010).
[3] Ho, et. al., 2010 APS March Meeting, A38.00005 (2010).

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