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Evidence for re-entrant, zero field quantum critical point, with chemical tuning in $Ce_{1-x}Yb_xCoIn_5$[1] Y.P. SINGH, D.J. HANEY, X.Y. HUANG, Kent State University, B.D. WHITE, M.B. MAPLE, University of California, San Diego, M. DZERO, C.C. ALMASAN, Kent State University — We performed specific heat and electronic transport studies on single crystals of $Ce_{1-x}Yb_xCoIn_5$ alloys with the motivation to probe further, some of the previously reported unusual behaviors, such as robust coherence and superconductivity, persistent non-Fermi liquid (NFL) behavior, and the possibility of quantum criticality in higher Yb doping. These measurements are performed in temperatures as low as 0.5 K and magnetic fields up to 14 T. Our analysis of specific heat and resistivity data unveils the presence of a crossover in the properties of x = 0.54 doping crystals, from a high temperature NFL behavior to Fermi-liquid (FL) behavior at lower temperatures. We show that the origin of the NFL behavior is a result of quantum fluctuations. Our analysis also establishes that the alloy with x = 0.54 Yb concentration is quantum critical, i.e., $x_c = 0.54$.

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