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Non-Fermi liquid behavior with and without quantum criticality in $Ce_{1-x}Yb_xCoIn_5$[1] Y.P. SINGH, T. HU, Kent State University, L. SHU, M. JANOSCHEK, University of California, San Diego, M. DZERO, Kent State University, M.B. MAPLE, University of California, San Diego, C.C. ALMASAN, Kent State University — In a growing number of f-electron systems the non-Fermi liquid (NFL) behavior occurs in the absence of an obvious quantum phase transition (QPT), which takes place at a quantum critical point (QCP). An intriguing candidate is $Ce_{1-x}Yb_xCoIn_5$ that exhibits an unconventional T – x phase diagram without an apparent QCP. Therefore, it is important to elucidate the nature of the NFL behavior and to search for possible QCPs in this system Here we reveal a field induced QCP (H_{QCP}) through normal state magneto-resistivity measurements and find its evolution with x. The full suppression of H_{QCP} for $x > 0.2$ has surprisingly little effect on the Kondo lattice coherence. At low Yb concentrations, resistivity consists of two contributions with linear and sub-linear temperature dependences, while at higher concentrations only the sub-linear term is present. These results imply that the NFL behavior could be a new state of matter in its own right rather than a consequence of the underlying QPT.

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