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Non-Fermi liquid behavior in quantum critical iron-pnictide metal Ba(Fe,Ni,Co)$_2$As$_2$ YASUYUKI NAKAJIMA, KEVIN KIRSHENBAUM, ALEX HUGHES, CHRISTOPHER ECKBERG, RENXIONG WANG, TRISTIN METZ, SHANTA SAHA, JOHNPIERRE PAGLIONE, Univ of Maryland-College Park — The breakdown of Landau's Fermi liquid theory has been believed to be induced by quantum fluctuations in the vicinity of a quantum critical point (QCP), occasionally accompanied by exotic superconductivity in the strongly correlated electron systems, such as cuprate and iron pnictide superconductors [1]. However, the superconducting dome of such materials with high Tc precludes us from investigating the interplay between quantum fluctuations and the exotic superconductivity. We report non-Fermi liquid behavior associated with quantum fluctuations in the transport and thermodynamic properties of the non-superconducting iron pnictide Ba(Fe,Co,Ni)$_2$As$_2$, which allows us to elucidate the behavior on cooling down to near absolute zero without distractions from the superconductivity. We will discuss the evolution of non-Fermi liquid behavior with magnetic field, highlighting the presence of field tuned QCP. [1] T. Shibauchi et al., Annu. Rev. Condens. Matter Phys. 5, 113 (2014).

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