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Non- Fermi liquid behavior and quantum criticality in $UCu_{4+x}Al_{8-x}$ compound FARZANA NASREEN, KARUNAKAR KOTHAPALLI, New Mexico State University, MILTON TORIKACHVILLI, San Diego State University, HEINRICH NAKOTTE, New Mexico State University, SAN DIEGO STATE UNIVERSITY COLLABORATION — We report on experimental studies of electrical and magneto-transport on some of the compounds of $UCu_{4+x}Al_{8-x}$ family as a function of temperature, hydrostatic pressure, and/or magnetic field. It has been reported that $UCu_{4+x}Al_{8-x}$ can be tuned through a quantum critical point (QCP) using chemical pressure. UCu_4Al_8, the x=0 compound, shows antiferromagnetic transition at $T_N \sim 32$ K. It has also been reported that T_N goes to zero at x = 1.15 and because of the presence of this QCP, further increase in the chemical pressure yields heavy fermion behavior with the highest value of $\gamma = 800 mJ/K^2$-mol for x =1.75. Our studies show that for the magnetically-ordered compounds, hydrostatic pressure is found to increase the Néel temperature, whereas for the heavy fermion compounds $T_{\rho,max}$ is increased with pressure. We also report on the heat capacity measurements in temperature down to 300 mK. The heat capacity results are discussed in terms of physics of non-Fermi liquid scaling and its relation to QCP.

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