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Monte Carlo Calculations of the Specific Heat in Quantum Critical Metals JOHN GADDY, WOUTER MONTFROOIJ, University of Missouri - Columbia, THOMAS VOJTA, Missouri University of Science and Technology — Quantum critical magnetic metals have unusual low temperature response such as an anomalous temperature dependence of the electronic specific heat ($c_v \sim T \ln T$). This dependence originates in the competition between ordering local magnetic moments and the conduction electrons shielding the moments. The Kondo Temperature, T_K when moments become shielded depends on the inter-atomic distances. In most systems that have been investigated experimentally quantum criticality is obtained through lattice expansion by chemical substitution, one can expect a distribution of T_K reflecting altered local inter-atomic distances. The random removal of these moments leads to the formation of magnetic clusters in quantum critical metals which has indeed been observed in quantum critical $CeRu_{0.5}Fe_{1.5}Ge_2$. We investigate the dependence of the specific heat through the formation through magnetic cluster formation. Once a cluster separates itself from the lattice, it should order and affect the specific heat.. Using a Monte Carlo simulation we calculate the changes in specific heat associated with cluster formation for various Kondo temperature distributions, and we compare our results to those measured in 122-systems like $CeRu_{0.5}Fe_{1.5}Ge_2$.

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