Quantum critical behaviour of heavy Fermion CeNi2Ge2

BILAL ZOGHBI, Kent State University, ALMUT SCHROEDER, Kent State University, COLLIN BROHOLMS, Johns Hopkins University — Neutron scattering data of CeNi2Ge2 collected at SPINS at NIST will be presented to characterize the magnetic correlations and dynamics close to an antiferromagnetic quantum critical point (AF QCP). The dynamical susceptibility $\chi''(q,E)$ has been measured in a temperature range $0.1K<T<30K$. While the q-independent fluctuations remain unchanged for $T<30K$, the enhanced susceptibility $\Delta \chi''$ close to the wavevector $q=(0.5,0.5,0)$, shows a relaxation rate following the absolute temperature $kBT$ down to $5K$ but then remains finite towards the lowest $T = 0.1$ K. The Lorentzian linewidth is reduced to about 0.4 meV, a factor of ten smaller than the rate observed in the q-independent spectrum. The energy, q, and T dependence of $\Delta \chi''$ shows characteristics of the fluctuations expected close to an AF QCP in 3 dimensions, stating that CeNi2Ge2 lies beside the AF QCP.


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