

Abstract Submitted
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Complete mapping of dynamic spin correlations in the Hidden Order phase of URu₂Si₂¹ H. BARATH, Johns Hopkins University, Z. YAMANI, W.J.L. BUYERS, CNRC, National Research Council, Canada, T. WILLIAMS, G. LUKE, McMaster University, Canada, J. RODRIGUEZ, J. LEAO, NIST Center for Neutron Research, D. GARRETT, McMaster University, Canada, K.J. MCCLELLAN, E.D. BAUER, J.L. SARRAO, LANL, USA, C. BROHOLM, Johns Hopkins University — URu₂Si₂ is a heavy fermion compound which undergoes a phase transition at 17.5 K to a “Hidden Order (HO) phase”. We use inelastic neutron scattering to investigate spin correlations in the HO and paramagnetic phases and find them to be qualitatively different. While the normal state response has sharp features in Q but not in energy, consistent with an itinerant magnet, a distinct spectral gap develops in the HO phase. These results are consistent with previous measurements [1]. Here we present a full measurement of the scattering function, $S(\mathbf{Q},\omega)$, for energy transfers, $\hbar\omega < 11$ meV throughout the [H 0 L] plane. The data shows qualitatively different dispersion within, and perpendicular to, the tetragonal basal plane and provides information about the Fermi surface and its reconstruction upon entering the HO phase.

[1] C.R. Wiebe *et. al.*, Nature Physics, **3**, 96-100 (2007).

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