Inelastic neutron scattering studies of itinerant spin excitations in URu$_2$Si$_2$ near the hidden order transition

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— We performed extensive neutron scattering studies on the heavy fermion superconductor URu$_2$Si$_2$. Using the C5 triple axis spectrometer at Chalk River, we studied the spin excitations recently reported [C. R. Wiebe, J. A. Janik et al, Nature Physics] above and below the $T_0$ transition. It has become clear from our previous work that these incommensurate itinerant spin excitations account for the entropy change into the hidden order (HO) state. This severely limits the possible theoretical scenarios on the ground state of the HO phase.

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