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Momentum space structure of quasielastic spin fluctuations in $Ce_3Pd_{20}Si_6$ ALISTAIR CAMERON, PAVLO PORTNICHENKO, MAKSYM SURMACH, Institut für Festkörperphysik, TU Dresden, PASCALE DEEN, European Spallation Source, SILKE PASCHEN, ANDREY PROKOFIEV, Institute of Solid State Physics, Vienna University of Technology, JEAN-MICHEL MIGNOT, Laboratoire Léon Brillouin, ANDRÉ STRYDOM, Physics Department, University of Johannesburg, MARK TELLING, ISIS Facility, Rutherford Appleton Laboratory, ANDREY PODLESNYAK, Quantum Condensed Matter Division, Oak Ridge National Laboratory, DMYTRO INOSOV, Institut für Festkörperphysik, TU Dresden — $Ce_3Pd_{20}Si_6$ is one of the heaviest electron systems amongst the heavy-Fermion metals. We have used high-resolution neutron spectroscopy to observe the low-energy region of magnetic scattering from the paramagnetic state, finding that at low temperatures the quasielastic magnetic response is present throughout the Brillouin zone. It forms a broad hump, centred at the (111) scattering vector, surrounded by minima of intensity at (002), (220) and the equivalent wavevectors. This momentum space structure distinguishes it from a simple crystal-field excitation, as proposed previously, and suggests it results from short-range dynamical correlations between the Ce ions, mediated by itinerant f-electrons via the RKKY interaction. The momentum-space symmetry of the quasielastic response suggests that it stems from the cubic Ce sub-lattice occupying the 8c Wyckoff site, which is responsible for hosting static AFM order below T_N, in contrast to the crystallographically inequivalent 4a site which does not appear to contribute magnetically.

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