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Spin fluctuations and hidden-order phases in Ce-based Kondo systems[1] D. S. INOSOV, P. Y. PORTNICHENKO, A. S. CAMERON, TU Dresden, Germany, S. PASCHEN, A. PROKOFIEV, Vienna Univ. of Technology, Austria, G. FRIEMEL, H. JANG, B. KEIMER, MPI for Solid State Research, Germany, V. B. FILIPOV, N. Y. SHITSEVALOVA, Institute for Problems of Materials Science, Ukraine, A. SCHNEIDEWIND, Juelich Center for Neutron Science, Germany, A. IVANOV, J. OLLIVIER, Institut Laue-Langevin, France, P. P. DEEN, European Spallation Source, Sweden, A. M. STRYDOM, University of Johannesburg, South Africa — Among heavy-fermion metals, both CeB_6 and $Ce_3Pd_{20}Si_6$ compounds exhibit a magnetically hidden ordered phase in their low-temperature phase diagram, which is attributed to the ordering of magnetic quadrupolar moments, known as the antiferroquadrupolar (AFQ) ordering. Using inelastic neutron scattering, we have investigated the spectrum of spin excitations in both systems. In the structurally simplest CeB_6, it consists of several contributions including conventional spin waves that coexist with both ferro- and antiferromagnetic excitonic resonance-like modes. However, the structurally more complex $Ce_3Pd_{20}Si_6$ possesses a much simpler magnetic excitation spectrum with only a single contribution peaked around the AFQ wave vector. It remains quasielastic in the absence of an external magnetic field, but then develops into dispersive magnon modes whose band width scales linearly with the applied field. Furthermore, neutron diffraction measurements on the same sample at sub-Kelvin temperatures revealed diffuse magnetic scattering that can be associated with the hidden order parameter.

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