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Existence of Heavy Fermions in the Antiferromagnetic Phase in CeIn3

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We report the pressure-dependent optical conductivity spectra of a heavy fermion (HF) compound CeIn3 below the Neel temperature of 10 K to investigate the existence of the HF state in the antiferromagnetic (AFM) phase. The peak due to the interband transition in the hybridization gap between the conduction band and nearly localized 4f states (c-f hybridization) appears at the photon energy of about 20 meV not only in the HF regime but also in the AFM regime. Both the energy and intensity of the c-f hybridization peak continuously increase with the application of pressure from the AFM to the HF regime. This result suggests that the c-f hybridization, as well as the heavy fermions, exists even in the AFM phase of CeIn3.

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