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Doping study of the heavy fermion superconductor $CePt_2In_7$[1]
NIRMAL GHIMIRE, FILIP RONNING, J. THOMPSON, ERIC BAUER, Los Alamos National Laboratory — The $CeMIn_5$ (M=Co, Rh, Ir) materials are prototypical heavy fermion superconductors close to antiferromagnetism, making them ideal candidates to investigate the interplay of unconventional superconductivity and magnetism and to explore quantum criticality. $CeRhIn_5$ displays all of the signatures of a material close to an antiferromagnetic quantum critical point (QCP): 1) the antiferromagnetism at $T_N = 3.8$ K is suppressed under applied pressure at Pc=2.5 GPa, 2) non-Fermi liquid behavior in the electrical resistivity and specific heat is observed near Pc, and 3) a dome of unconventional superconductivity appears with Tc max=2.6 K. To investigate the nature of the quantum criticality in the $Ce_mM_nIn_{3m+2n}$ family, we focus attention on the newest member, $CePt_2In_7$, with m=1 and n=2, where m and n are $CeIn_3$ and MIn_2 layers. Similar to its cousin $CeRhIn_5$ (m=1, n=1), it shows a dome of superconductivity and signatures of quantum criticality under pressure in the vicinity of where the Neel temperature is suppressed at Pc=3 GPa. As an alternative to the application of pressure to access the QCP, we present the magnetic, thermal and transport properties of doped $CePt_2In_7$.

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