

Abstract Submitted
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Superconductivity and magnetism in the doping series $U_2Rh_xPt_{(1-x)}C_2$ NICHOLAS WAKEHAM, Los Alamos Natl Lab, NI NI, UCLA Physics & Astronomy, DARRICK WILLIAMS, ERIC BAUER, JOE THOMPSON, FILIP RONNING, Los Alamos Natl Lab — U_2PtC_2 has been known for many years to exhibit nearly-heavy-fermion behavior, as well as superconductivity, $T_c \sim 1.5$ K. Little is known about the nature of the superconductivity, but many other uranium based heavy fermion superconductors, such as UPt_3 and UBe_{13} , have been shown to be unconventional. U_2RhC_2 also shows nearly-heavy-fermion behavior, but it is non-superconducting and reported to be antiferromagnetic, $T_N \sim 18$ K. These observations have motivated our study of the doping series of $U_2Rh_xPt_{(1-x)}C_2$ in order to investigate the evolution from the antiferromagnetic to the superconducting groundstate, as well as the role of the antiferromagnetism in the superconductivity. Through measurement of the resistivity, magnetic susceptibility and heat capacity of polycrystalline samples, we show the suppression of antiferromagnetism, the presence of competing ferromagnetism, and emergence of superconductivity with doping. Furthermore, we present evidence that the emergence of superconductivity, which deviates from single-gap BCS theory, is not directly related to the suppression of antiferromagnetism.

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