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Evolution of the superconducting state through quantum criticality in $\mathbf{CeRh_{1-x}Co_xIn_5}$ JOHNPIERRE PAGLIONE, Center for Nanophysics and Advanced Materials, Department of Physics, University of Maryland, M.A. TANATAR, J.P. REID, LOUIS TAILLEFER, Département de Physique, Université de Sherbrooke, Canada , M.B. MAPLE, Department of Physics and Institute of Pure and Applied Physical Sciences, University of California, San Diego — The Ce-based 115 materials exhibit a host of novel ground states separated by experimentally tunable quantum instabilities. In the single-crystal alloy series $CeRh_{1-x}Co_xIn_5$, long range antiferromagnetic order is gradually suppressed upon chemical substitution of Co for Rh and followed by a robust superconducting state extending to the 2.3 K transition of the infamous heavy-fermion superconductor $CeCoIn_5$. Here we present a thorough study of heat transport measurements of high- quality single crystals of $CeRh_{1-x}Co_xIn_5$ for several different superconducting samples spanning both the coexistent magnetic and non-magnetic regions of the x-T phase diagram. By extracting the residual ($T \to 0$ limit) electronic thermal conductivity of samples at several x values, we analyze the nature of the superconducting state on either side of the incipient quantum critical point near $x \simeq 0.65$ and study the influence of coexistent magnetism on the pairing state of these materials.

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