

Abstract Submitted
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Andreev reflection spectroscopy of the heavy-fermion superconductor CeCoIn₅ along different crystallographic orientations WAN KYU PARK, LAURA GREENE, University of Illinois at Urbana-Champaign, JOHN SARRAO, JOE THOMPSON, Los Alamos National Laboratory — We have performed Andreev reflection spectroscopy on single crystals of the heavy-fermion superconductor CeCoIn₅. Conductance spectra obtained along both (001) and (110) crystallographic orientations exhibit similar features including asymmetry in the background conductance, the magnitude of zero-bias conductance enhancement (12 - 13%) and the energy scale for the conductance enhancement (~ 1 meV). Analysis of the (001) junction data taken at the lowest temperature (400 mK) using an extended Blonder-Tinkham-Klapwijk model gives $2\Delta/k_B T_c = 4.64$ [1,2]. The failure to account for the full temperature dependence of the data sets requires further theoretical investigations to account for the magnitude of the Andreev signal, including the possibility of two-fluid behavior. Features in the (110) data may provide the first spectroscopic evidence for $d_{x^2-y^2}$ superconducting order parameter symmetry [2,3]. [1] W. K. Park *et al.*, Phys. Rev. B **72**, 052509 (2005). [2] W. K. Park *et al.*, cond-mat/0507353. [3] W. K. Park and L. H. Greene, cond-mat/0507489. This work was supported by the U.S. DoE Award No. DEFG02-91ER45439 through the FSMRL and the Center for Microanalysis of Materials at UIUC.

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