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Point-contact spectroscopy of the pure and Cd-doped heavy-fermion superconductor CeCoIn₅ W. K. PARK, L. H. GREENE, Univ. of Illinois at Urbana, J. L. SARRAO, J. D. THOMPSON, Los Alamos National Lab., L. D. PHAM, Univ. of California-Davis, Z. FISK, Univ. of California-Irvine — Point-contact spectroscopy has been performed on pure and Cd-doped CeCoIn₅. Conductance spectra of CeCoIn₅ along three different orientations exhibit consistent features: i) background asymmetry; ii) Andreev reflection signal over similar energy scales (~ 1 meV) and of similarly reduced magnitudes (10 - 13%) at zero-bias.^{1,2} Comparison with the extended Blonder-Tinkham-Klapwijk model calculations indicate the first spectroscopic evidence for $d_{x^2-y^2}$ symmetry of the superconducting order parameter.^{1,2} A two-fluid model³ will be discussed to explain the asymmetry and the reduced Andreev reflection. Cd-doped (10%) CeCoIn₅ exhibits intriguing conductance behaviors as a function of temperature and magnetic field, undergoing antiferromagnetic and superconducting transitions: a broad zero-bias peak below T_N and two competing conductance channels below T_C . 1.W.K. Park *et al.*, PRB **72**, 052509 (2005); cond-mat/0507353; cond-mat/0606535. 2.W.K. Park and L.H. Greene, PRL **96**, 259702 (2006). 3. S. Nakatsuji, D. Pines and Z. Fisk, PRL **92**, 016401 (2004). Work supported by the U.S. DoE DEFG02-91ER45439 through the FSMRL and the CMM at UIUC, by NSF-DMR-0503360 at UCD & UCI, and performed at LANL under auspices of the U.S. DoE, office of Science.

Prefer Oral Session
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