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Point Contact Spectroscopy Study of $CeCoIn_5$: Evidence for Unconventional Pairing in a Multi-Band Heavy Fermion Superconductor P. M. C. ROURKE, C. S. TUREL, University of Toronto, Canada, M. A. TANATAR, University of Toronto, Canada; Institute for Surface Chemistry, National Academy of Sciences Ukraine, Kiev, Ukraine, C. PETROVIC, Brookhaven National Laboratory, USA, J. Y. T. WEI, University of Toronto, Canada — Point-contact spectroscopy was performed on single crystals of the heavy-fermion superconductor $CeCoIn_5$ in the temperature range 150mK to 2.5K. A pulsed measurement technique ensured minimal Joule heating over a wide voltage range. The spectra show Andreev-reflection characteristics with multiple structures which depend on junction impedance. Spectral analysis using the generalized BTK formalism revealed two nodal order-parameter components, with amplitudes Δ_1=0.95 $\pm$0.15meV and Δ_2=2.4$\pm$0.3meV which evolve differently with temperature. These observations indicate a highly unconventional pairing mechanism, possibly involving multiple bands [1]. Measurements are also done in a magnetic field to study the field-evolution of the order-parameter components we observed.
[1] P.M.C. Rourke, *et al.* cond-mat/0409562.
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