Abstract Submitted
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Scanning tunneling microscopy and spectroscopy measurements of heavy fermion compound $CeCoIn_5$[1] EDUARDO DA SILVA NETO, PEGOR AYNAJIAN, COLIN PARKER, Princeton University, PAUL TOBASH, ERIC BAUER, Los Alamos National Laboratory, ALI YAZDANI, Princeton University — The heavy fermion compound $CeCoIn_5$ has a rich electronic phase diagram as a function of doping, pressure, and magnetic field. The interaction between Ce's f-electrons and the conduction bands is expected to form Kondo screening of the spins starting at relatively high temperatures. Below 2.3 K $CeCoIn_5$ is known to exhibit an unconventional superconducting ground state. We present scanning tunneling microscopy and spectroscopy (STM/S) as a function of temperature on $CeCoIn_5$. The in-situ cleaved samples show three different layer terminations. Acquiring structural information from STM topographies we identify the chemical character of each layer. STS measurements, on all surfaces, performed over a wide range of temperature show the rapid development of an energy gap in the tunneling density of states near the onset of coherence ($\sim$ 40 K). The origin of the observed energy gap and its relation to heavy band hybridization is addressed.

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