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Probing the superconducting order parameter of UPt3 by Josephson Interferometry J.D. STRAND, F. KIDWINGIRA, D.J. VAN HARLINGEN, University of Illinois at Urbana-Champaign, J.P. DAVIS, W.P. HALPERIN, Northwestern University — The unconventional superconductor UPt3 exhibits two superconducting transitions which are believed to correspond to two distinct superconducting phases. The symmetry of the order parameter in these phases has yet to be determined and the origin of the double transition remains an open question. We have fabricated Josephson junctions by evaporating copper and lead films onto UPt3 single crystals. Using a SQUID potentiometer, we observe critical currents that onset at the upper transition temperature of the crystal ($\sim$0.55K) and increase as the temperature is lowered. We are studying the magnetic field dependence of the critical current in edge and corner junctions to obtain direct information about the phase anisotropy of the order parameter and hence its pairing symmetry. We are particularly interested in measurements near the lower transition temperature ($\sim$0.50K) at which the order parameter is predicted to become complex and hence break time-reversal symmetry.

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