

Abstract Submitted
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Josephson interferometry evidence for order parameter with anisotropic and possibly complex phase in UPt3¹ JOEL STRAND, DALE VAN HARLINGEN, University of Illinois at Urbana/Champaign, J. B. KYCIA, J. P. DAVIS, WILLIAM HALPERIN, Northwestern University — The unconventional superconductor UPt3 exhibits many interesting properties. Among the most exciting is that it has two superconducting transitions, believed to arise from two different degenerate order parameters, at least one of which breaks time-reversal symmetry. The nature of the order parameter in each of these phases and the crossover between them is still not fully understood. We have fabricated Josephson junctions on various faces of high quality single crystals of UPt3. Measuring the magnetic field dependence of the critical current through these junctions produces patterns that reveal the intrinsic phase differences and underlying symmetry of the order parameter. Our results point to an order parameter with anisotropic and possibly complex phase that extends throughout the entire crystal. This is in contrast with our work on Sr2RuO4, which also breaks time-reversal symmetry but exhibits a distribution of dynamic chiral order parameter domains.

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