

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Bulk Magnetization in the Superconducting State of UPt₃¹

WILLIAM GANNON, WILLIAM HALPERIN, Northwestern University, Department of Physics and Astronomy, USA, CATHERINE RASTOVSKI, MORTEN ESKILDSEN, University of Notre Dame, Department of Physics, USA, PENGCHENG DAI, University of Tennessee, Department of Physics and Astronomy, USA, ANNE STUNAUULT, Institut Max von Laue-Paul Langevin, France — The unconventional superconductor UPt₃ has long been thought to have an odd parity orbital, and triplet spin state. An important signature of such a state is the temperature independence of the spin susceptibility across the superconducting transition temperature. Here, we report bulk measurements of the susceptibility of UPt₃ for magnetic fields along the crystal a-axis performed with polarized neutron diffraction. Temperature independence at all magnetic fields is observed, suggesting a spin triplet superconducting state for the entirety of the phase diagram, with equal spin pairs in the crystal basal plane. These results will be discussed in the context of existing theories for the superconducting state of this paradigm heavy fermion material [Graf et. al., PRB 62, 14393; Tsutsumi et. al., JPSJ 81, 074717 (2012)].

¹Support from US Department of Energy, Basic Energy Science, Division of Materials Science and Engineering awards DE-FG02-05ER46248, DE-FG02-10ER46783, and DE-FG02-05ER46202

William Gannon
Northwestern University, Department of Physics and Astronomy, USA

Date submitted: 08 Nov 2012

Electronic form version 1.4