Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

NMR Studies of Plutonium-based Superconductors N.J. CURRO, T. CALDWELL, E.D. BAUER, L.A. MORALES, M.J. GRAF, Y. BANG[1], J.D. THOMPSON, A.V. BALATSKY, J.L. SARRAO, Los Alamos National Laboratory — The intermetallic plutonium-based compound $PuCoGa_5$ exhibits the highest superconducting transition temperature for a heavy- fermion compound (18.5K), and may bridge the gap between the high temperature superconducting transition metal oxides, and the Ce and U-based heavy fermion superconductors. The unusual magnetic and electronic behavior of the plutonium may play a significant role in the pairing mechanism. We have performed extensive Ga and Co NMR investigations of the electric field gradient (EFG), the Knight shift and the spin lattice relaxation rate in both the normal and superconducting states, and our results suggest an unconventional pairing symmetry. Time dependent studies of the EFG suggest the presence of significant changes to the lattice due to the radioactive decay of the Pu.

[1]also at Dept. Physics, Chonnam National University, Kwangju, Korea

Nicholas Curro
Los Alamos National Laboratory

Date submitted: 23 Dec 2004 Electronic form version 1.4