Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Effects of self-irradiation on local crystal structure and 5f localization in $PuCoGa_5$ C. H. BOOTH, M. DANIEL, R. E. WILSON, Lawrence Berkeley National Laboratory, E. D. BAUER, J. N. MITCHELL, N. O. MORENO, L. A. MORALES, J. L. SARRAO, Los Alamos National Laboratory, P. G. ALLEN, Lawrence Livermore National Laboratory — X-ray absorption fine-structure (XAFS) measurements demonstrate the structural and electronic changes involved in destroying superconductivity in $PuCoGa_5$ due to self-irradiation damage. In particular, the Pu L_{III}-edge data indicate a more localized f-orbital relative to the itinerant paramagnet $UCoGa_5$, potentially increasing with radiation damage. Moreover, the local crystal structure in aged material is disordered much more strongly than expected, consistent with all atoms within a damage cascade displaced from their equilibrium positions.

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Date submitted: 22 Nov 2006 Electronic form version 1.4