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μSR measurement of the superconducting penetration depth in aged $PuCoGa_5$ R. H. HEFFNER, K. OHISHI, W. HIGEMOTO, T. ITO, Japan Atomic Energy Agency, G. D. MORRIS, TRIUMF, Canada, M. J. FLUSS, LLNL, USA, D. E. MACLAUGLIN, L. SHU, U. C. Riverside, USA, E. D. BAUER, J. L. SARRAO, LANL, USA — The superconductor $PuCoGa_5$ possesses a relatively high critical temperature ($T_c = 18.5$ K), a moderate mass enhancement (Sommerfeld coefficient $\cong$ 80 mJ/mol-K^2) and exhibits behavior consistent with spin-fluctuation-induced d-wave superconductivity [1]. It is also radioactive, with its dominant radioisotope ^{239}Pu having a half-life of 2.4 x 10^4 yrs. We report μSR measurements of the temperature and field dependence of the magnetic field penetration depth λ(T,H) in a 400 day-old sample of $PuCoGa_5$ ($T_c = 15$ K), and compare these results to data obtained on the same sample approximately one year earlier. In 600 Oe applied field both measurements show a linear low-temperature behavior for $\lambda(T) - \lambda(0) = bT$ for $T/T_c < 0.5$ with the same coefficient b. The magnitude of $\lambda(0)$ in the aged sample has increased by a factor of about 1.8. The results are discussed in terms of the effects of radiation damage on the postulated d-wave superconducting order parameter. [1] J. L. Sarrao *et al.*, Nature 420, 297 (2002); N. J. Curro et al., Nature 434, 622 (2005).

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