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Quantum criticality in single crystalline YFe2Al10 determined from zero-field and longitudinal-field muon spin relaxation[1] KEVIN HUANG, CHENG TAN, JIAN ZHANG, ZHAOFENG DING, Department of Physics, Fudan University, DOUGLAS MACLAUGHLIN, Department of Physics, UC Riverside, OSCAR BERNAL, Department of Physics, CSU Los Angeles, PEI-CHUN HO, Department of Physics, CSU Fresno, LIUSUO WU, MEIGAN ARONSON, Department of Physics, Stony Brook University, LEI SHU, Department of Physics, Fudan University — Muon spin relaxation (μSR) measurements were performed on single crystalline YFe_2Al_{10} down to 19 mK and in magnetic fields up to $\sim$100 Oe. Zero-field-μSR measurements showed no evidence of magnetic order down to 19 mK, consistent with previous measurements. However, we also find that the depolarization rate Λ is temperature independent above 1 K but increases in an exponential behavior for $T < 1$ K. Longitudinal-field μSR measurements also reveals a time-field scaling where $G(t, H) = G(t/H^{\gamma})$, with $\gamma = 0.67$. This is further confirmed from the magnetic field dependence of Λ, which finds $\Lambda(H) \propto H^{0.67}$ at 19 mK. This is further evidence that single crystalline YFe_2Al_{10} is in close proximity to a ferromagnetic quantum critical point.

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