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$^{135,137}$Ba NMR study of $\text{Ba}_3\text{Mn}_2\text{O}_8$ STEVE SUH, W.G. CLARK, GUOQING WU, S.E. BROWN, UCLA, E.C. SAMULON, I.R. FISHER, Stanford, C.D. BATISTA, LANL, A.P. REYES, P. KUHNS, L.L. LUMATA, NHMFL, Tallahassee — We report results from $^{135,137}$Ba NMR spectroscopy and relaxation rate ($1/T_1$) measurements in single crystal $\text{Ba}_3\text{Mn}_2\text{O}_8$, an $S=1$ dimer system with a singlet ground state. Thermodynamic measurements have shown it has multiple field-induced phase transitions for fields exceeding a critical field $H_{c1} \approx 90$ kOe and varying with field orientation. We have evaluated the hyperfine couplings and electric field gradients in the normal phase for one of the two inequivalent Ba sites, and find a significant anisotropic component to the hyperfine coupling. Measurements of $1/T_1$ made at fixed fields down to temperatures $T < 0.4$ K are consistent with critical behavior in the vicinity of $H_{c1}$. However, lower temperatures are needed to clarify the universality class. Goals for upcoming experiments include a determination of the spectrum in the low-symmetry phases and an evaluation of $1/T_1$ for $T < 0.4$ K.

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Steve Suh
UCLA Physics and Astronomy

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