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^{135,137}Ba NMR study of $Ba_3Mn_2O_8$ 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 $Ba_3Mn_2O_8$, 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} $\simeq$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. This work is supported at UCLA by NSF Grants 0520552 (SEB), DMR-00334869 (WGC), Stanford by DMR-0134613 (IRF), and NHMFL by 0084173 and the State of Florida.

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