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Spin excitations in $Ba(Fe_{0.957}Cu_{0.043})_2As_2$ single crystals near a putative antiferromagnetic quantum critical point[1] MIN GYU KIM, Lawrence Berkeley Natl Lab, P. VALDIVIA, Dep. Material Science & Engineering, UC Berkeley, S. CHI, Quantum Condensed Matter Division, ORNL, S. RAN, G.S. TUCKER, Ames Lab & Dep. Physics Astronomy, ISU, A.D. CHRISTIANSON, Quantum Condensed Matter Division, ORNL, E. BOURRET-COURCHESNE, Lawrence Berkeley Natl Lab, S.L. BUD'KO, P.C. CANFIELD, A. KREYSSIG, R.J. MCQUEENEY, A.I. GOLDMAN, Ames Lab & Dep. Physics Astronomy, ISU, R.J. BIRGENEAU, Lawrence Berkeley Natl Lab — We report on inelastic neutron scattering measurements of the spin excitations in the non-superconducting $Ba(Fe_{0.957}Cu_{0.043})_2As_2$ compound that orders antiferromagnetically at T_N =26(5) K in the near vicinity of a putative antiferromagnetic quantum critical point. These results are compared to those of previous studies on low Cu doped $BaFe_2As_2$ and high Co doped $BaFe_2As_2$ compounds. While Co doping induces superconductivity and Cu doping does not, we find that the Cu-doped and Co-doped spectra are qualitatively similar so additional factors must be considered to explain why the Cu-doped compound is not a superconductor. In addition, we show a possible E/T scaling in this compound, which has been observed in many heavy fermion and cuprate superconductors at/near putative quantum critical points.

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