Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Competing Magnetic Phases in $Ba(Fe_{0.925}Mn_{0.075})_2As_2$[1] G.S. TUCKER, D.K. PRATT, M.G. KIM, S. RAN, A. THALER, Ames Laboratory and Department of Physics & Astronomy, Iowa State University, G.E. GRANROTH, K. MARTY, Oak Ridge National Laboratory, W. TIAN, J.L. ZARESTKY, S.L. BUD'KO, P.C. CANFIELD, A. KREYSSIG, A.I. GOLDMAN, R.J. MCQUEENEY, Ames Laboratory and Department of Physics & Astronomy, Iowa State University — Inelastic neutron scattering measurements on $Ba(Fe_{0.925}Mn_{0.075})_2As_2$ show broad, diffusive spin fluctuations at two different propagation vectors corresponding to stripe magnetic order and conventional Néel antiferromagnetic order. Below $T = 80\,\mathrm{K}$ long-range stripe magnetic ordering occurs and sharp spin wave excitations appear at the stripe propagation vector while diffusive spin fluctuations remain at the Néel propagation vector. These results suggest that low concentrations of Mn dopants introduce a competing magnetic phase that may prevent the development of superconductivity in $Ba(Fe_{1-x}Mn_x)_2As_2$.

[1]The work at the Ames Laboratory was supported by US DOE, Office of Basic Energy Sciences, DMSE, contract DE-AC02-07CH11358.

Gregory Tucker
Ames Laboratory and Department of Physics & Astronomy,
Iowa State University

Date submitted: 12 Dec 2011 Electronic form version 1.4