Competing Magnetic Phases in Ba(Fe$_{0.925}$Mn$_{0.075}$)$_2$As$_2$\textsuperscript{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$_{0.075}$)$_2$As$_2$ show broad, diffusive spin fluctuations at two different propagation vectors corresponding to stripe magnetic order and conventional Néel antiferromagnetic order. Below $T = 80$ 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$_x$)$_2$As$_2$.

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