Abstract Submitted
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Antiferromagnetic ordering in the absence of a structural distortion in $\mathbf{Ba(Fe_{1-x}Mn_x)_2As_2}$[1] A.I. GOLDMAN, M.G. KIM, A. KREYSSIG, A. THALER, D.K. PRATT, W. TIAN, J.L. ZARESTKY, Ames Laboratory, USDOE and Iowa State University, M.A. GREEN, NIST Center for Neutron Research, S.L. BUD'KO, P.C. CANFIELD, R.J. MCQUEENEY, Ames Laboratory, USDOE and Iowa State University — Neutron and x-ray diffraction studies of $Ba(Fe_{1-x}Mn_x)_2As_2$ for low doping concentrations ($x \leq 0.176$) reveal that at a critical concentration, $0.102 < x < 0.118$, the tetragonal-to-orthorhombic transition abruptly disappears whereas magnetic ordering with a propagation vector of ($1/2$ $1/2$ 1) persists. Among all of the iron arsenides this observation is unique to Mn doping, and unexpected because all models for stripe-like antiferromagnetic order anticipate an attendant orthorhombic distortion due to magnetoelastic effects. We discuss these observations and their consequences in terms of previous studies of $Ba(Fe_{1-x}TM_x)_2As_2$ compounds (TM = transition metal), and models for magnetic ordering in the iron arsenide compounds.

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