

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Effect of uniaxial strain on the structural and magnetic phase transitions in BaFe_2As_2 CHETAN DHITAL, Boston College, Z. YAMANI, Canadian Neutron Beam center, Canada, WEI TIAN, Oak ridge National Laboratory, Oakridge, TN, J. ZERETSKY, Ames Laboratory, A.S. SEFAT, Oak ridge National Laboratory, Oakridge, TN, ZIQIANG WANG, Boston College, R.J. BIRGENEAU, University of California, Berkley, STEPHEN WILSON, Boston College — We report neutron scattering experiments probing the influence of uniaxial strain on both the magnetic and structural order parameters in the parent bilayer iron pnictide compound BaFe_2As_2 . Under the application of modest strain fields along the in-plane orthorhombic b-axis, we observe an upward shift in the onset of both the structural and magnetic phase transition temperatures. Our data show that modest strain fields can affect significant changes in phase behavior simultaneous to the removal of structural twinning effects. As a result, we demonstrate in BaFe_2As_2 samples detwinned via uniaxial strain that the in-plane C_4 symmetry is broken by both the structural lattice distortion and long-range spin ordering at temperatures far above the nominal, strain-free, phase transition temperatures. The relevance of our measurements to earlier transport measurements in detwinned crystals of BaFe_2As_2 is discussed.

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Date submitted: 17 Nov 2011

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