

Abstract Submitted  
for the MAR12 Meeting of  
The American Physical Society

**Anisotropic magnetoelastic coupling in iron arsenide superconductors: an x-ray diffraction study in high magnetic field** J.P.C. RUFF, R.K. DAS, Z. ISLAM, Advanced Photon Source, Argonne National Laboratory, J.-H. CHU, H.-H. KUO, I.R. FISHER, Stanford University, H. NOJIRI, Tohoku University — We report high-resolution single crystal x-ray diffraction measurements of underdoped  $\text{Ba}(\text{Fe}_{1-x}\text{Co}_x)_2\text{As}_2$  in pulsed magnetic fields as high as 28 Tesla. Our direct measurements confirm earlier reports of strong and highly anisotropic magnetoelastic coupling in iron arsenides. We observe magnetic field induced de-twinning of orthorhombic samples, and characterize the magnitude of the effect as a function of temperature and field. We identify a range of field and temperature where samples can be 100% de-twinned by magnetic fields less than 30 Tesla. The effect shows a notable insensitivity to SDW ordering, but varies rapidly in the vicinity of the superconducting transition.

Jacob Ruff  
Advanced Photon Source, Argonne National Laboratory

Date submitted: 13 Nov 2011

Electronic form version 1.4