

Abstract Submitted
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Magneto-elastic Coupling in Single-crystal CeFeAsO¹ H.-F. LI, J.-Q. YAN, J.W. KIM, R.W. MCCALLUM, T.A. LOGRASSO, D. VAKNIN, AMES LABORATORY, U.S. DOE, AMES, IOWA 50011, USA TEAM, DEPARTMENT OF PHYSICS AND ASTRONOMY, IOWA STATE UNIVERSITY, AMES, IOWA 50011, USA TEAM, ADVANCED PHOTON SOURCE, ARGONNE NATIONAL LABORATORY, ARGONNE, ILLINOIS 60439, USA TEAM, DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING, IOWA STATE UNIVERSITY, AMES, IOWA 50011, USA TEAM — Single-crystal synchrotron X-ray diffraction studies of CeFeAsO reveal strong anisotropy in the charge correlation lengths along or perpendicular to the in-plane antiferromagnetic (AFM) wave-vector at low temperatures. The high-resolution setup allows to distinctly monitor each of the twin domains by virtue of a finite misfit angle between them that follows the order parameter. We find that the in-plane correlations, above the orthorhombic (O)-to-tetragonal (T) transition, are shorter than those in each of the domains in the AFM phase, indicating a distribution of the in-plane lattice constants. This strongly suggests that the phase above the structural transition is virtually T with strong O-T fluctuations that are induced by magnetic fluctuations.

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H.-F. Li

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