

Abstract Submitted
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Intermediate orthorhombic phases in Ba-122 Iron Arsenides¹

J.P.C. RUFF, CHESS, Cornell University, Z. ISLAM, R.K. DAS, The Advanced Photon Source, Argonne National Lab, H.-H. KUO, I.R. FISHER, Stanford University — Despite widespread interest, there are details of the tetragonal-orthorhombic structural phase transition in the iron arsenide superconductors that remain controversial. We have revisited the transition in three characteristic compositions of the canonical “122” family $\text{Ba}(\text{Fe}/\text{Co})_2(\text{As}/\text{P})_2$ using single crystal synchrotron x-ray diffraction. In the parent compound, we confirm previous observations of a sequence of structural transitions which are closely spaced in temperature, and uncover pronounced magnetoelastic effects in the intermediate orthorhombic phase. Modification of the structural transitions by doping is observed to differ significantly depending on whether the dopant is Co or P.

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