

Abstract Submitted
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Interactions between rare earth and iron magnetism in *REFeAsO* single crystals¹ A. KREYSSIG^{2,3}, ²Ames Laboratory; ³Dep. of Physics and Astronomy, Iowa State University, Ames, M.G. KIM^{2,3}, W. TIAN², W. RATCLIFF II⁴, ⁴NIST, NCNR, Gaithersburg, J.-W. KIM⁵, ⁵APS, ANL, Argonne, S. NANDI^{2,3}, J.-Q. YAN², B. JENSEN², K.W. DENNIS², R.W. MCCALLUM^{2,6}, ⁶Dep. of Materials Science and Engineering, Iowa State University, Ames, T.A. LOGRASSO², J.W. LYNN⁴, J.L. ZARESTKY², R.J. MCQUEENEY^{2,3}, A.I. GOLDMAN^{2,3} — In iron-based pnictides high-temperature superconductors, magnetic fluctuations and magneto-elastic effects are believed to be important for the superconducting electron pairing mechanism. To gain insight into the interplay between the different ordering phenomena and the underlying couplings we studied the tetragonal-to-orthorhombic distortion and the magnetic order by x-ray and neutron diffraction on *REFeAsO* single crystals. The onset of rare earth (*RE* = Nd, Pr) magnetic order is coupled to changes in the iron magnetic structure without affecting the lattice distortion. High-resolution neutron and x-ray resonant magnetic scattering measurements down to 0.4 K revealed complex magnetic structures with multiple propagation vectors at low temperatures.

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