Abstract Submitted
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Imaging of doped iron pnictides across a structural phase transition[1] JACLYN SCHILLINGER, Department of Physics and Astronomy, The University of Alabama, WILLIAM CHENG, VIKTOR KRAPIVIN, Department of Physics Astronomy, Rutgers University, ATHENA SAFA SEFAT, LI LI, Materials Science and Technology Division, Oak Ridge National Lab, ALEXANDER LEE, SHANGFEI WU, HSIANG-HSI KUNG, BRIAN DENNIS, GIRSH BLUMBERG, Department of Physics Astronomy, Rutgers University — The emergent anisotropy through a structural-phase transition in an iron pnictide single crystal of $Ba(Fe_{0.987}Au_{0.012})_2As_2$ was studied using polarized laser light microscopy. The undoped parent of $BaFe_2As_2$'s crystal structure distorts from tetragonal to orthorhombic at the structural phase transition temperature T_S, which coincides with an antiferromagnetic transition, causing the formation of structural domains that can be observed as stripes across the sample. For $Ba(Fe_{0.987}Au_{0.012})_2As_2$, however, T_S =108 K and the Neel temperature T_N =100 K. We studied the disappearance of these domains as the sample was heated across these transitions. Images of the sample were taken using a defocused laser beam through fully crossed polarizers. The images were analyzed by aligning and averaging groups of images to reduce noise, by taking the difference of the images above and below T_S to isolate the stripes from the background, and by using Fourier transformations and comparing them to those of simulated striped patterns.

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