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Manipulating stripes in $\text{La}_{2-x}\text{Ba}_x\text{CuO}_4$ in extreme environments¹

MARKUS HUECKER, GENDA GU, ZHIJUN XU, JINSHENG WEN, JOHN M. TRANQUADA, Brookhaven National Laboratory, MARTIN VON ZIMMERMANN, HASYLAB at DESY, Hamburg, Germany — Competing magnetic and electronic interactions in the copper-oxide high temperature superconductors often result in nanoscale inhomogeneity of the charge and spin density. Such observations motivated a proposal that dynamic electronic inhomogeneities are intrinsic to the copper-oxide planes, and can result in electronic states that break their four-fold symmetry. We have performed high-energy single-crystal X-ray diffraction in high magnetic fields and at high pressure to show that the charge and spin stripe phase in $\text{La}_{2-x}\text{Ba}_x\text{CuO}_4$ constitutes such a state. In particular, our results provide strong evidence that charge stripe correlations in the cuprates are electronically driven and are enhanced within vortices.

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