

Abstract Submitted
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Strong correlation effects in the electron momentum density distribution of $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$ B. BARBIELLINI, Northeastern U. – NU, P.E. MIJNARENDS, NU and Delft University of Technology, S. KAPRZYK, NU and AGH, Poland, R.S. MARKIEWICZ, NU, M. ITOU, Y. SAKURAI, JASRI/SPring-8, Japan, K. YAMADA, Tohoku Univ., Japan, A. BANSIL, NU — Compton scattering offers unique capabilities for measuring absolute spectral weights, which are not obtainable by other spectroscopies. Moreover, this technique is genuinely a bulk-sensitive probe. In this connection, we have carried out a series of high resolution Compton scattering measurements on oriented single crystals of $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$ at three different dopings $x=0, 0.15$ and 0.30 , together with corresponding computations based on the LDA and on models for treating strong correlation effects. Theoretical predictions are compared and contrasted with the experimentally reconstructed two-dimensional electron momentum densities to identify strong correlation effects in the spectra, and to delineate how these effects evolve as the system undergoes the transition from the Mott insulator to the superconductor. Work supported in part by the USDOE.

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