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Quasiparticle scattering from impurities in the cuprates E.A. NOWADNICK, I.M. VISHIK, B. MORITZ, W.S. LEE, Z.X. SHEN, T.P. DEVEREAUX, Stanford University and SLAC, K. TANAKA, Osaka University — Scanning tunneling spectroscopy (STS) measurements have shown that the local density of states in the cuprate superconductors is spatially inhomogeneous. Fourier-transformed STS has been used to investigate the mixing of momentum space eigenstates of the superconducting quasiparticles in the presence of this inhomogeneity, and has observed the extinction of the quasiparticle peaks upon approaching the antinodal region of the Fermi surface. We present calculations of momentum dependent quasiparticle scattering from impurity sites. Our results demonstrate that the quasiparticle extinction observed in FT-STs can be interpreted as resulting from the momentum dependence of the quasiparticle scattering rather than the absence of the quasiparticle itself. This interpretation agrees with recent ARPES measurements that observe quasiparticle peaks over the entire Fermi surface.

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