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Doping Dependent Anisotropic Electronic Scattering rate in LSCO

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An angle-resolved photoemission study of the scattering rate in the normal and superconducting states of the high-temperature superconductor $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$ as a function of binding energy and momentum will be presented. We report that, close to optimal doping, the scattering rate scales linearly with binding energy up to a high-energy scale E_1 . The scattering rate is found to be strongly anisotropic, with a minimum along the nodal direction of the superconducting gap. Since both the degree of anisotropy and the energy dependence of the scattering rate appear to be strongly doping dependent, possible connections to a quantum-critical point will be discussed.